HEALTH BEHAVIORS AND PLASMA LIPID LEVELS IN MUSLIM PATIENTS WITH CORONARY HEART DISEASE DURING FASTING PERIOD IN THE MONTH OF RAMADAN IN NARATHIWAT PROVINCE

SUDANUN SANG-GASSANEE

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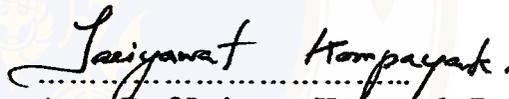COPYRIGHT OF MAHIDOL UNIVERSITY

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....
Miss Sudanun Sang-gassanee
Candidate

....
Asst. Prof. Siriorn Sindhu, D.N.Sc.
Major-advisor

....
Assoc.Prof.Jariyawat Kompayak, Dr.P.H.
Co-advisor

....
Dr.Thongchai Lertwilairattanapong, M.D.,
Grad.Dip.in Clin. (Internal Medicine)
Co-advisor

....
Prof.Liangchai Limlomwongse
Ph.D.,
Dean
Faculty of Graduate Studies

....
Assoc.Prof.Kobkul Phancharoenworakul
Ph.D.,
Chairman
Master of Nursing Science
Faculty of Nursing

Thesis
entitled

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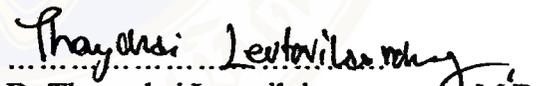
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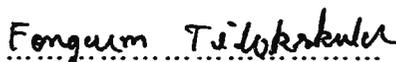Master of Nursing Science (Adult Nursing)

On

April 18, 2000

....
Miss Sudanun Sang-gassanee
Candidate

....
Asst. Prof. Siriorn Sindhu, D.N.Sc.
Chairman

....
Asst.Prof. Pichet Kalamkasait
M.A. (Comparative Religion)
Member

....
Assoc.Prof.Jariyawat Kompayak, Dr.P.H.
Member

....
Assoc.Prof.Fongcum Tilokskulchai
Ph.D. (Nursing)
Member

....
Dr.Thongchai Lertwilairattanapong, M.D.,
Grad. Dip.in Clin. (Internal Medicine)
Member

....
Prof.Liangchai Limlomwongse
Ph.D.,
Dean
Faculty of Graduate Studies
Mahidol University

....
Assoc.Prof.Kobkul Phancharoenworakul
Ph.D.,
Dean
Faculty of Nursing
Mahidol University

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Sudanun Sang-gassanee

This study examines the health behaviors of Muslim patients with coronary heart disease (CHD) before and during fasting in the Ramadan month. The objectives were to study and compare the plasma lipid levels in the Muslim CHD patients' before and after the month of Ramadan, and to study the Muslim CHD patients' symptoms before and during the month of Ramadan. The subjects were 70 Muslim patients with CHD who were fasting in the month of Ramadan at the Sungai-Golok hospital's heart clinic. Their fasting took place from December, 9 1999 to January, 8 2000. The data were collected by interview instruments which are personal data records, personal health record forms, interview forms on food and frequency of eating one week prior to Ramada and during Ramadan, the interview forms of daily behavior and interview forms of CHD symptoms and blood samples to determine the plasma lipid levels. The data were collected one week before and one week after the month of Ramadan. The data was analyzed by frequency distribution, percentage, arithmetic mean, standard deviation, and the t-test.

The findings revealed eating behaviors before fasting and during fasting in the month of Ramadan were suitable. The sample decreased their exercise during Ramadan. They had more religious practices during the fasting than before the month of Ramadan. Cholesterol, triglyceride, and low-density lipoprotein cholesterol (LDL-C) showed no significant differences but high-density lipoprotein cholesterol (HDL-C) was significantly different between before and during the fasting (p< .05). There were also more CHD symptoms before the fasting than during the month of Ramada.

These findings suggest that nurses and health care teams should take Muslim patients eating behavior during fasting into consideration. However, there are some benefits from an increase HDL-C , and decrease in CHD symptoms during the fasting. The health care team may come up with the strategies concerning health promotion in this period particularly for the people in the area who share the same life style and religious practice.

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สุดานันท์ แสงกาศนีย์ : การศึกษาพฤติกรรมสุขภาพและระดับไขมันในเลือดของผู้ป่วยมุสลิม โรคหลอดเลือดหัวใจที่ถือศีลอดช่วงเดือนรอมฎอนในจังหวัดนราธิวาส (HEALTH BEHAVIORS AND PLASMA LIPID LEVELS IN MUSLIM PATEINTS WITH CORONARY HEART DISEASE DUING FASTING PERIOD IN THE MONTH OF RAMADAN IN NARATHIWAT PROVINCE) คณะกรรมการควบคุมวิทยานิพนธ์ : ศิริอร สินธุ, D.N.Sc. , จริยาวัตร คมพยัคฆ์, Dr.P.H. , ธงชัย เลิศวิไลรัตนพงศ์, พ.บ., ว.ว.อายุรศาสตร์   99 หน้า. ISBN 974-663-866-1

วัตถุประสงค์ในการศึกษาครั้งนี้คือ เพื่อศึกษาพฤติกรรมสุขภาพของผู้ป่วยมุสลิมโรค หลอดเลือดหัวใจก่อนและขณะถือศีลอดในเดือนรอมฎอน เพื่อศึกษาและเปรียบเทียบระดับไขมันใน เลือดก่อนและหลังถือศีลอดของเดือนรอมฎอนในผู้ป่วยมุสลิมโรคหลอดเลือดหัวใจและเพื่อศึกษา อาการแสดงของผู้ป่วยมุสลิมโรคหลอดเลือดหัวใจก่อนและระหว่างเดือนรอมฎอน โดยมีกลุ่มตัวอย่าง คือประชากรของผู้ป่วยมุสลิมโรคหลอดเลือดหัวใจที่ถือศีลอดจำนวน 70 คน ในคลินิคหัวใจ โรงพยาบาลสุไหงโก-ลก ซึ่งเก็บข้อมูลในช่วงก่อนและหลังถือศีลอด 1 สัปดาห์ ซึ่งข้อมูลได้จากการ ตรวจร่างกาย ผลทางห้องปฏิบัติการและแบบสัมภาษณ์ประกอบด้วยข้อมูลทั่วไป อาหารที่รับประทาน ในหนึ่งสัปดาห์ที่ผ่านมา กิจกรรมก่อนและระหว่างถือศีลอด และอาการแสดงโรคหลอดเลือดหัวใจ แสดงผลและวิเคราะห์ข้อมูลโดยใช้ความถี่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตราฐาน และเปรียบเทียบ ระดับไขมันในเลือด ทั้งก่อนและหลังถือศีลอดในเดือนรอมฎอนโดยใช้ t- test

ผลการวิจัยพบว่า พฤติกรรมการรับประทานอาหารก่อนถือศีลอดและระหว่างการถือศีลอดใน เดือนรอมฎอนอยู่ในพฤติกรรมที่เหมาะสม   กลุ่มตัวอย่างมีการออกกำลังกายน้อยแต่มีการปฏิบัติ ศาสนกิจเพิ่มขึ้นในระหว่างการถือศีลอด สำหรับไขมันในเลือดพบว่า ระดับ High-Density Lipoprotien Cholesterol   มีความแตกต่างอย่างมีนัยสำคัญทางสถิติ (p< .05) ส่วนผลของโคเลสเตอรอล ไตรกลีเซอไรด์และLow-Density Lipoprotien Cholesterol ไม่มีแตกต่างอย่างมีนัยสำคัญทางสถิติ นอก จากนี้กลุ่มตัวอย่างมีอาการแสดงของโรคหลอดเลือดหัวใจในช่วงก่อน ถือศีลอดมากกว่าช่วงระหว่าง การถือศีลอด

จากผลการศึกษาทีมสุขภาพพึงตระหนักและเอาใจใส่เรื่องพฤติกรรมการรับประทานอาหาร ช่วงการถือศีลอดของชาวมุสลิม นอกจากนี้ยังสามารถนำผลที่ HDL-C ที่ลดลงและอาการแสดงโรค หลอดเลือดหัวใจที่ลดลงในระหว่างการถือศีลอด เพื่อหากลยุทธ์ในการส่งเสริมสุขภาพแก่ประชาชนที่ อยู่ในพื้นที่ที่มีการดำเนินชีวิตที่ใกล้เคียงกัน ในช่วงการถือศีลอด

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CHAPTER 1

INTRODUCTION

Rationale and the Background of the Problem

Cardiovascular disease is one of the most important health problems in the world as well as in Thailand. It has been found that one fourth of the people who die in the world suffer from cardiovascular disease. It accounts for half and 16 percent of the mortality rate in developed and developing countries respectively.

Nowadays, cardiovascular disease is the leading cause of death in Thailand. It has increased every year since 1983, especially coronary heart disease (CHD). A report from the Thai Ministry of Public Health (1997) revealed that there were 3,726,738 cases of death from CHD, which was 68.6 per 100,000 persons. When this disease is analyzed in different regions of Thailand, it is found that the southern part has the most patients, and that was 36.84 per 100,000 persons. It was higher than the ratio of the whole country, which was 31.66 per 100,000 persons.

In Narathiwat Province, according to a survey of the in and out patient departments of two general hospitals (Narathiwatrajnakarindhra Hospital and Sungai-Golok Hospital), it was found that CHD has increased every year. The number of death caused by CHD from 1993 to 1995 were 254,304,340 respectively. In 1997 and 1998, the admitted patients had increased to 42.2 percent.

There are a lot of effects that occur after diagnosis of CHD on patients such as changes of life style, changes in the future plans for life, physiological and emotional

effects concerning severity of the disease, expensive cost of treatment or intervention, and continuous cost of treatment of the disease which cannot be completely cured. So, attention to risk factors as a preventive measure of CHD is more important than treatment itself.

The important risk factors in CHD are the individuals' health behaviors in their life style such as eating, exercising, smoking and feeling of stress. The other factors are age, sex, obesity, hypertension, diabetes mellitus, etc. (Hanucharornkul, S. 1998: 71-73). In fact, the eating behavior is the most important factor because it is the cause of the higher levels of plasma lipid. (Tunpijitr, W. 1997: 1). High lipid level in plasma is the cause of plaque that is the triggers CHD.

Nowadays, CHD cannot be completely treated, but it can be prevented by good individual health behaviors. One interesting behavior is eating behavior. Eating high content of fat leads to high risk of complication from CHD. There are two important lipids in plasma: triglyceride (TG) and cholesterol (TC) which are controlled by high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C). (Tunpijitr, W. 1996: 39). Therefore, eating is an important factor that can control the amount of lipids in plasma.

In Thailand, there are two studies, which indicated that the southern Thai people have high levels of lipid in the plasma. The first study reported on lipid levels in 13,151 Thai subjects. (Faculty of Public Health, Mahidol University, 1996). It found that 1,527 cases or 11.3 percent of the subjects had cholesterol higher than 200 mg/dl. Among those, 16 percent were southern Thais. Yib-Insoy, T. & Yib-Insoy, S. (1994:1-8) studied risk factors in CHD of southern Thais and found that one third of people who were older than

40 years old had cholesterol higher than 240 mg/dl. The risk factor in CHD from over nutrition is 75 percent, it seems necessary to study the eating behaviors of southern Thais.

In the south of Thailand, the life style and eating behavior are affected by culture, life style, religion, and geography. There is a study about the eating behavior which found that these people eat rice and flour products more than those in other parts of country. The other common foods are coconut milk and coconut oil, which is a saturated oil that is considered a risk factor of hyperlipidemea. They eat more fish than meat and in a larger quantity than those who live in other the parts, but at the same time, they eat less vegetable though in appropriate quantity. The condiments used are salt, shrimp or fish paste, and fat from crabs. According to a report of the Faculty of Public Health, 56.95 percent of southern people use these condiments everyday. There are 70 percent who eat sugar daily, which is higher than those in the other parts of Thailand. Also, 31.85 percent eat desserts daily, which is also more than those in the rest of the country. (The Faculty of Public Health,1996: 94-97).

From this survey, it can be seen that the food that southern Thais eat is high in fats and cholesterol such as liver, animal's entrails, chicken skin, egg yolk, oyster, squid and coconut milk. Different kinds of oil used in cooking such as animal fat, palm oil, and coconut oil can change the cholesterol in the body. Triglyceride also derives from carbohydrate such as sugar, flour, desserts, soft drinks, carbonated water, and sweet fruits. (Summasoot, R. 1993: 102). When lipid level is high, it becomes a cause of CHD and it can develop into myocardial infarction. (Watcharagkul,P. & Srisura,W. 1989: 202-212).

In the four provinces in southern Thailand, there are a lot of factors that affect eating behavior, one of which is fasting in the fasting period in the month of Ramadan. It

is the behaviors that change the daily life style, because Muslims have to wake up to eat before sunrise and do not eat all day until after sunset. The food in some families is special than the food they eat in non-fasting periods. They try to decrease daily activities during daytime, but they have more religious practices all day. The religious practices include reading the Koran, going to the mosque and praying for longer time than usual. These practices affect the related mental health during fasting.

The investigator conducted a pilot study on the eating habits of fifteen Muslims who fast in the month of Ramadan, and found that eating times were changed and the subjects had to get up to eat before the sun rose. They had more special foods they did than during normal periods and they increased the number of meals before they slept. More than fifty percent ate more than two meals a day. The food composition also had more fat. All subjects, both male and female, gained weight for two to three kilograms during the fasting period. The increased weight could adversely affect the objectives of the fasting and their health. This eating behavior might disturb the body balance in both normal subjects and CHD patients.

Therefore, fasting in the month of Ramadan has two effects on the body depending on personal behaviors. The positive effect on the CHD patients is that they use the energy stored in the body, decrease the CHD symptoms, and have plenty of rest. During that period, everybody would change their daily activities. For example, they read the Koran with increased concentration, and have more relaxation, to reduce stress from fasting.   On the contrary, if the patients have mal-practices of fasting, it can increase body weight and the plasma's lipid level, which increases severity from CHD.

Specifically, it will disturb the heart and circulation systems that are the signs and symptoms of CHD.

Therefore, it is interesting to study the effects of health behaviors of Muslims in the South of Thailand during the month of Ramadan. Narathiwat Province is a border province in the South that has the most Muslims (80.1%) in Thailand. (The National Statistic Office of Thailand, 1998). Sungai-Golok Hospital is a general hospital with a heart clinic which enables the follow-up of the CHD patients. The investigator is interested in studying the health behaviors and the plasma lipid levels in this CHD group. There is a benefit for the health teams in the local area concerning with the effects of fasting so as to find the interventions for the health prevention of this problem.

Research Question

1. Are the daily activities of the CHD patients who fast such as eating behavior, physical activities, and religious practice, before the month of Ramadan different from those during the month of Ramadan?

2. Are the plasma lipid level in the CHD patients who fast before the month of Ramadan different from that after the month of Ramadan?

3. Are the CHD symptoms in the CHD patients who fast before the month of Ramadan different during the month of Ramadan?

4. What are the effects of fasting during the month of Ramadan on the health of CHD patients?

5. What are the effects of fasting during the month of Ramadan on the health behaviors of CHD patients?

Purposes of the Study

       1.To study health behaviors of Muslim patients with coronary heart disease before and during the fasting period in the month of Ramadan.

       2.To study the plasma lipid levels of Muslim patients with CHD before and after the fasting in the month of Ramadan.

       3.To compare the plasma lipid levels of Muslim patients with CHD before and after the fasting in the month of Ramadan.

       4.To study the Muslim CHD patients' symptoms before and during the fasting in the month of Ramadan.

Conceptual framework

       In a medical science model, the plasma lipid levels depend on health behaviors of individual life style. These health behaviors include eating behavior, the kind of food eaten, the kind of fat in each type of food, activity, and stress at each time. (Tunpijitr, W. 1998: 650-652; Kosulwat, S. 2000). The plasma lipid levels are related to atherosclerosis and increase the risk of CHD because it leads to lack of blood and oxygen supply. Finally, the symptom that appears is angina or chest pain. So, the hyperlipidemea is a result of undesirable health behaviors.

       When the body has hyperlipidemea, it shows sings and symptoms because the body system uses the internal and external resources of the body to adjust and maintain its balance (Neuman, 1995: 30). If each person has best health behaviors, they will have good body balance. This means that the body can prevent the occurrence or reduce the severity of diseases.

Generally, Muslim life styles depend on social, cultural, and religious practice. They have an effect on health behaviors, too. One group of Muslims have different behaviors from those of other groups. Furthermore, health behaviors are different between the usual time and the fasting period in the month of Ramadan. The fasting changes the eating behavior which, in turn, means the change of a decrease in eating time, decreasing number of meals, an increase in the type of special food, an increase in religious practice, and an increase in the sleeping and resting time. Their daily activities change, and the circadian time is changed as well. And, when the circadian time is changed, it affects metabolism, gastrointestinal tract, autonomic nerverse system, and endocrine system (Chokroverty, S. 1994: 57-70, 349-353). Therefore, the body must adjust body system balance during fasting.

The changes in health behaviors during the month of Ramadan have an effect on the change of plasma lipid levels that is related to signs and symptoms in CHD patients. So, this framework is base on the concept that the health behaviors during the fasting period affects plasma lipid levels. If Muslims have the right practice, the changes in one month are the same as the intervention that is like health prevention. On the other hand, it may have other health effects if Muslims have wrong practice. Therefore, the different health behaviors in the month of Ramada may affect the CHD sign (plasma lipid levels) and symptoms because it is a result of an adjustment of the body system. This study, therefore, measures the processes and the outcome which is the difference in the plasma lipid levels after the fasting and CHD symptoms during the month of Ramadan.

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┌──────────────┐                ┌──────────────────────┐
│ Health behavior│              │ Health behaviors during│
│ Before fasting │              │  the month of Ramadan  │
└──────────────┘                └──────────────────────┘
        │        Before the fasting period        │         After the fasting period
        │                                         │
        ▼                                         ▼
   ┌──────────────────┐                      ┌──────────────────┐
   │ - Plasma lipid levels│ ──────────────▶  │ - Plasma lipid levels│
   │ - CHD symptoms   │                      │ - CHD symptoms   │
   └──────────────────┘                      └──────────────────┘
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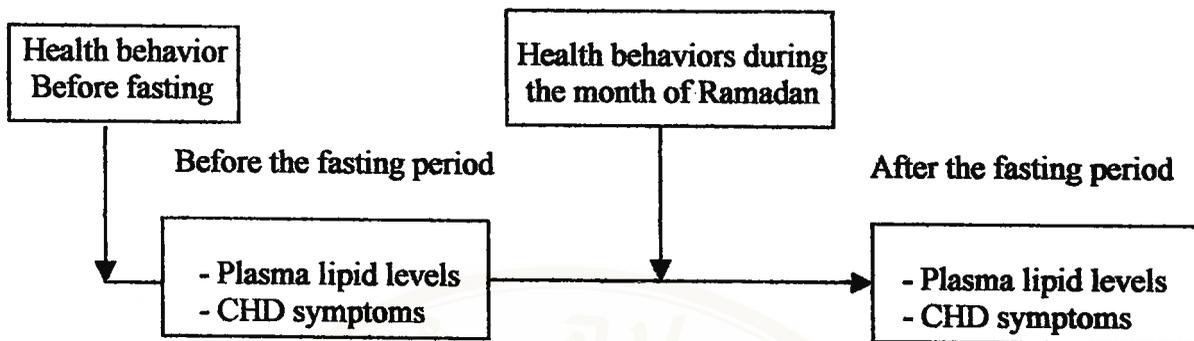
Diagram 1: The health behaviors affecting plasma lipid levels and CHD symptoms

Scope of the Study

This study was conducted with the Muslim CHD patients who were fasting during the month of Ramadan at the Sungai-Golok Hospital's heart clinic from December 9, 1999 to January 8, 2000 .

Definition of Terms

Plasma lipid levels are the levels of total cholesterol, triglyceride, high-density lipoprotein cholesterol and low-density lipoprotein-cholesterol in the blood of the Muslim patients who had CHD. These were checked by the Sungai-Golok laboratory before and after the month of Ramadan.

Health behaviors are the daily life activities of the CHD Muslim patients including eating, resting, and exercising before and during the month of Ramadan. They

were evaluated by different research instrument to check food intake and frequency of food taken and the open end questionnaires about daily activities.

  The symptoms are the CHD patients' symptoms before and during the month of Ramadan. These are collected by the interview form of the symptoms of the CHD patients a month before and during the month of Ramadan.

Expected Outcomes and Benefits

  1.To obtain more understanding about the plasma lipid levels related to the CHD risk factors during the month of Ramadan and to explain the effects of fasting.

  2. To use information in planning nursing intervention and giving appropriate knowledge to Muslim CHD patients concerning health behaviors that are related to the disease, and to form the strategies for health promotion and health prevention about food and health behaviors in CHD patients during the month of Ramadan.

  3. To construct the database concerning the effects of fasting for the health care teams in the areas so as to establish the same practice and to plan for the health prevention in the future.

  4. To use the information to find patients with risk factor at the early stage and to give treatment to the Muslim CHD patients who have the symptoms during and after the month of Ramadan.

CHAPTR II

LITERATURE REVIEW

This chapter focuses on the health behaviors and the plasma lipid levels in the CHD Muslim patients who are fasting during the month of Ramadan in Narathiwat Province, concerning particularly with eating behavior and the activities during this period. The literature review include theories, journals, and empirical studies on the life style of people in Narathiwat Province according to the following topics:

1. The risk factors that are the cause of CHD in Muslims patients with CHD in Narathiwat Province

2. The Muslims' health status in the fasting period during the month of Ramadan in terms of:

        2.1 the meaning and the concepts of fasting

        2.2 the practices during the month of Ramadan

        2.3 effects of fasting on CHD patients

The risk factors that are the cause of CHD in Muslim patients with CHD in Narathiwat Province

Coronary heart disease (CHD) has several different names such as ischemic heart disease (IHD), coronary artery disease (CAD), and atherosclerotic heart disease (ASHD).

Coronary heart disease means the deformation of the heart, both acute and chronic, which is caused by the circulation of the heart. The symptoms include chest pain or angina pain that is resulted from the imbalance of the heart blood supply and the demand of the heart in when demand is more than supply. It leads to lack of blood in the myocardium and lack of oxygen supply which leads to angina pain. The severe chest pain can be myocardial infarction and cause sudden death. The CHD patients also have other symptoms such as dyspnea on exertion, fatigue, dysrhythmia, and heart failure (Steanchok, P. & Chaisaree, P. 1993: 429-473).

CHD is a very important problem of the public health. It usually occurs in developed countries where people have abundance to eat. Thailand is a developing country with a largely rural population, but there are a lot of CHD cases, which have become a major cause of illness and death since 1983. The situation may be caused by modern technology and material development that has changed the society and affected the risk factors of CHD. The easier life style resulted from this material development has an effect on the emotion which in turn increases the stress in the society. (Bass, 1991: 69). That would cause the abnormal behaviors that decrease concern about health behavior.

Hanucharornkul, S. (1998: 71-73) categorized the risk factors of CHD into three groups. First, the risk factors of the self that cannot be changed such as genetics, age, sex, and nationality. The second group is the risk factors of a person that can be changed, which are the plasma lipid level, smoking, and the history of illness such as hypertension and diabetis milletus. The last group is reinforcing factors including lack of exercise, stress, and an individual's personality.

The plasma lipid is an important risk factor that can be changed because body fat comes from eating behavior (Tunpijitr, W. 1997: 1). Foods are the cause of other diseases such as obesity, rheumarthritis, gout, hypertension, and cancer (Summasoot, R. 1999: 1). The food selection of southern Thais is an important cause of hyperlipidemea, which is a personal factor that can be changed in CHD patients, if the CHD patients and their families are concerned about this problem. The patients must have self-efficacy that is self-perception and health beliefs about the changing of behaviors, which refers to self-regulation, and self-reflection.

In a southern Thai Muslim society, there is a mixture of beliefs, local cultures, and life styles, which has increasingly become a pattern due to technological development. Thai Muslims have a culture of eating differently because of the religious beliefs. Bruhn (1998: 74-75) stated that the health behavior is affected by the environment, culture, group of people in the society and behavior of each individual. As such, the introgression result should not contradict the beliefs in that area.

Muslim eating is greatly affected by religious beliefs. A master rule is not eating pork and not drinking alcohol or soft drinks. In fact, there are a lot of foods that they cannot eat based on the Islamic principle that food is good for health and it is not a luxury. From these provisions of law, Jittmoad (1992: 197-201) has summarized Muslim food and agreed with Rattanakul and Than (1996: 78-81) that:

1. Muslims should choose to eat and drink what is useful for the body. God has given food such as animals and plants, in the local area so that man would be alive. God will allow only useful foods and Muslims must refrain from what is bad for them.

Narathiwat Province has a long sea shores; therefore, seafood is the food that is given by God.

2. Muslims should eat a moderate amount of food and not eat lavishly. Moderate eating is appropriate to energy demand of the body because this energy passes the metabolism process, so the body can store fat and glycogen in the body. High fat in the body or hyperlipidemea is a risk factor of many diseases.

3. God advises the Muslims to eat the food that is beneficial for the body such as milk and honey. The Koran also talks about both the long term and short-term benefits those things. In Narathiwat Province, there is the Royal Project that promotes goat farms and the drinking of goat milk. Therefore, drinking goat milk is very popular for not only Muslims but also Buddhists living in the area.

4. The foods that Muslims are not allowed to eat are pork, animal blood, dead animals, sacrificed animals, animals which died in a number of specified ways, and the animals that have been killed without the name of Allah being said. In addition to this are reptiles and intoxicating food, food for more enjoyment, and any kind of habit-forming drugs.

Besides the provision of law, there are the practices related to eating and other religious practices. Fasting in the month of Ramadan is the practice that Muslim must do according to the pillars of Islam regarding five religious principles. So, it can be concluded that the Thai Muslim practices are related to eating, life style, and health behaviors.

Therefore, if evaluated according to the risk factors of cause and complication of CHD and Thai Muslim's health behaviors, that can be summarized and clarified into eight topics.   They are elevated serum lipid, smoking, obesity, caffeine, history of other diseases, lack of exercise, education level, and family income. The details of each topic will be discussed as follows:

1. Elevated serum lipid is the factor that is experienced most in Thailand, especially in the difference between food consumption in rural and urban societies. A different life style is seen as a different eating behavior.   Cholesterol higher than 200 mg/dl and triglyceride higher than 150 mg/dl are possible risks and can cause complication of the CHD.   In the Muslim society, it is found that food is cooked with coconut oil and animal fat. Muslims like to eat Khow Mog Kai (rice cooked with chicken and curry powder), Khow Man Kai (chicken with rice cooked in chicken broth), meat with fat, and fried sweets that are made with eggs. (Jundang,K.1997: iv). They do not like to eat vegetables or fruits. (Pratoomsil,W. 1986: 125).   Similarly, Wena Werawitaya (1984:65) found that the Muslims do not eat pork, and cook food with palm oil, coconut oil and cow's fat, which are considered saturated fats, and do not eat fresh vegetables. Moreover, Narathiwat Province is abundant with seafood for the local people. Seafood, except fish, is high in cholesterol, while fish have the omega-3 family of fatty acids which prevents blood clots forming on artery walls, lowers blood pressure, increases plasma HDL-C, and decreases LDL-C cholesterol. As a result, fish may contribute positive effects on CHD risk. (Katch & McArdle, 1993: 65). In addition, the Framingham study

found that cholesterol is related to CHD. If cholesterol increases by one percent, the risk of CHD will increase by two percent.

Even though lipid is a CHD risk factor, it is an important nutrition for the body. Lipid, a group of basic nutrients, is perhaps a source of most of the body's required energy. Although moderate consumption of fat is essential for health, over consumption can be dangerous. Most of the fat circulating in the body circulation is triglyceride (TG), which makes up about 95 percent of total body fat. The other 5 percent of body fat is composed of substances such as cholesterol and lipoprotein. (Donotelle, 1994 : 177)

Cholesterol, triglyceride and lipoproteins have important functions in the body. Cholesterol is an essential component of cell membrane transport; it is a precursor to hormone and bile acid. Triglyceride is a major sourse of energy for the body. When we consume too many calories, the excessive calory is converted into triglyceride in the liver. Lipoproteins are complex of non-polar lipid cores (cholesterol and triglycerides ester) surrounded by the surface coat of polar lipids (phospholipids and free cholesterol) and specific proteins. Lipoproteins are transport facilitators for cholesterol in the blood. High-density lipoproteins (HDLs) are capable of transporting more cholesterol than low-density lipoproteins (LDLs). They transport circulating cholesterol to the liver for metabolism and subsequent elimination from the body. People who have a high percent-age of HDLs therefore, appear to be at a lower risk of the development of cholesterol-clogged arteries.

Furthermore, the gut and the liver are responsible for the production of lipoproteins. During the digestive process, hydrolyzed products of fats enter epithelial

cells of the small bowel, where they are converted into the triglycerides and cholesterol ester.   These products are then aggregated into the lipoprotein complexes known as chylomicrons. Chylomycrons pass into small lymph vessels and reach the circulatory system through the thoracic duct. In the peripheral capillaries, chylomycrons are hydrolyzed by the enzyme lipoprotein lipase, which is located on the capillary endothelium.   Free fatty acids and glycerol enter adipose-tissue cell.   Chylomycrons rement are related into the circulation when lypolysis is nearly complete.   They are cleared rapidly by the liver. (Fair & Burke,1995: 735-747)

Both cholesterol and saturated fats in the diet can contribute to cardiovascular disease. Cholesterol can accumulate on the inner wall of arteries, causing a narrowing of the channel through which blood flows. It is called plaque, which is a major cause of atherosclerosis and poses a high risk of coronary heart disease. So, when choosing food, both saturated fats and cholesterol levels should be considered. The Ministry of Public Health limits Thai RDA (Thai Recommended Daily Intake) about daily nutrient for Thai people, who are over 6 years old, to no more than 20 grams of saturated fat. (Thairat 10 Oct,1999)

Each person has the correct way of eating in term of both quality and quantity. The American Heart Association and National Institute of Health have given advice on having food that has appropriate energy in order to prevent CHD, that is, 30 percent of fat, 55 percent of carbohydrate, and 15 percent of proteins of the total energy, in order to limit the cholesterol to less than 300 mg per day. Moreover, the condition of high cholesterol can be prevented by controlling food intake. Food in the moderate amount

can be eaten and the fat amount, especially the saturated fat, should be reduced. Unsaturated fat or oil should be used because it has linoic acid that can reduce cholesterol and triglyceride. Eating food that has complex carbohydrates and a lot of fiber can help to reduce fat and drain it out to the bile that produces stools. The appropriate amount of exercise can increase the HDL in blood and take cholesterol to the liver to restore it. Some snacks, desserts, and sweet fruits should also be avoided (Tunpijitr, W. 1997:7-13, Watcharangkul, P. & Srisura, W. 1989: 2.2-212).

The process that the Muslims cook their food consists of frying or dipping it in flour and frying. The oil in the cooking process increases fat in the food. The Muslim desserts are mainly made with coconut milk, eggs and flour. If they eat too much of these food and desserts, it can definitely increase the serum lipid. So, the kind of food and the process of cooking will affect the health behavior and can lead to an increase in cholesterol and TG.

International Lipid Information Bureau (ILIB, 1995) has set the standard of the unusual fat level affecting the risk of CHD, that is total cholesterol (TC) of more than 200 mg/dl, TG of more than 150 mg/dl, and HDL-c of less than 40 mg/dl. Besides, there is a TC/HDL-C ratio of more than 4.5 and LDL-C / HDL-c ratio of more than 3.0.

2. Smoking is one of the causes of CHD. In Narathiwat Province, it has been found that Muslim males like to smoke cigarettes while the older people like to smoke tobacco made from Jak-leaves which can be found easily in the local area. In the month of Ramadan, there is no smoking during the day and that can be considered a good behavior in that period.

3. Obesity is defined as having 30 percent of the weight over the normal standard or the body mass index is more than 25.0 kilogram per cubic meter (Tunpijitr, W. & Leelahakul, P. 1998: 642). Obesity increases the heart's pumping of blood. It is related to life style and working position such as sedentary work and non-sedentary work. Obesity can be a cause of hyperlipidemea and hypertension that affect the severity of CHD. The older obese person can have CHD, too. (Karrachai,1996: 3-7).

4. From the investigator's experience, the southern Thai Muslims like to drink tea and coffee, especially during breakfast. (The Muslim breakfast shop sells breakfast with tea and coffee.) These two drinks have caffeine, which affects for breathing center, increases the heart beat and blood pressure, and has a negative impact on the nervous system that influences sleeping. Consequently, it can be regarded as a risk of CHD in Muslims, too.

5. The history of other diseases the patients have such as diabetes mellitus and hypertension can lead to artherocslerosis which can in turn lead to an increase in the risk of CHD. There are a large of number Muslims who have the history of diabetes mellitus and hypertension.

6. Lack of exercise is one of the risks of CHD because exercise makes people healthy and increases the hearts' pumping rate. The Framingham study found that exercise is able to reduce the risk factor of CHD by decreasing weight, stress, cholesterol, and LDL-C, and increasing HDL. A survey of the headmen in Islam lore of Kanokwan Jandang (1997: iv) suggested that a lower level of exercise of those headmen was caused by their agricultural life style which increased the risk of CHD.

7. The education level of the CHD patients that influences the behavior and is related to the preceding factors is also important to health behavior (Green, et al, 1980: 68-76). From a number of studies, it was found that the patients play an important role in limiting and changing self-behavior by themselves. Ruth (1973:135-156) reports that a person who has a lower level of knowledge always has a problem in learning and understanding themselves than a person who has a higher level of education. Jitmuss (1989) discovers that a person who has a high level of education is better at taking care of themselves and having better health behavior. This agrees with Nittaya Pasunun (1976:76-77) who has studied CHD and found that the level of education is related to self care behavior.

8. The family income has an effect on eating behavior as well. Most Muslims in Narathiwat Province have low income due to the fact that the majority of people are working in agriculture. They are poor and cannot buy beneficial food. Also, people who have low income give more importance to finding money to live than concentrating on health behavior, solving health problems, and planning health programs for themselves. Autchariya Poungkeaw (1997:38) suggests that people with lower income are more interesed in solving immediate problems than planning for their heath behavior. When they have CHD, the poor economic status leads to problems concerning family income. So, the patients may be anxious about other responsibilities of theirs and they may have wrong health behaviors.

In the Islamic beliefs and the practice, there are a lot of health behaviors that can reduce the risk and severity of CHD: decreasing stress, not using oral contraception, and not having the type A personality. These can be explained separately as follows:

1. Stress is related to an increase in hypertension. The heart works harder. The present life style in the society has particularly increased stress which would in turn activate the sympathetic nervous system to secrete epinephrine and norepinephine from the adrenal gland. It has an effect on the heart rate for it can increase the heart rate rapidly, requires more oxygen supply, constricts blood vessels, and stimulates the secretion of adrenaline and cortisone, as well as increases plasma cholesterol (Chaiteerapan, S. 1987: 710). In the study of Chatchaporn and Patsamon Khumtaweeporn (1997) on the elderly who fasted in the month of Ramadan, it was found that the Muslims who fasted were more emotionally healthy than Muslims who did not fast. It is perhaps because they must pray five times a day, and sometimes more. This spiritual prayer is a way of communicating with the highest spiritual beings, expressing hope for forgiveness from all sins one might have committed, thus releasing all spiritual constraints and uneasiness, which finally results in relief from any kind of stress and frustration (Ratanakul & Than, 1996: 76-77).

During the day time in the month of Ramadan, the Muslims read the Koran and this activity leads to an increase in confidence, so it is considered a method to relieve stress.

2. Oral contraception is regarded as a cause of CHD. There are a lot of reports in USA that 49 percent of women liked to use oral contraception in family planning. Oral

contraception is an important risk cause of CHD. (Karrachi, 1996: 3-7). The occurrence of disease in this group is more thrombosis than artheriosclerosis. Muslims do not like to use any kind of family planing because it is against their religious beliefs. Therefore, oral contraception is not a risk factor of CHD in Muslims.

3. A person who has type A behavior is characterized as having a serious life, having an aspiration to be ambitious, wanting to have a complete life, wanting to win, and having worries whether work is done in time. This personality type A is related to CHD due to the physiological and biochemical factors which change the sympathetic-adrenal medular system and the pituitary adrenal-cortisol system of neuroendocrine pathway with a relation to the environment. (Price, 1982: 132). Muslims in Nararhiwat Province still live in a rural and agricultural society; therefore, they have very little competitive behaviors. Hence, behavior is not a risk factor among the Muslims.

This evaluation of the risk factors of CHD in the Muslims in Narathiwat Province shows that eating behavior is a factor that requires a thorough understanding in finding strategies for the local people to prevent and continue care for CHD.   Good heath behaviors can decrease the morbility and mortality rate brought about by CHD. The CHD Muslim patients are not different from other patients. When they know that they have CHD , they would take self care of themselves (Aish & Isenberg, 1996: 259-270). Orem (1980: 35) defines that the goal of self-care is to support life process, to promote health, to keep development usual, prevent health changes, and to ensure the quality of life.

If self-care is appropriate for better health behavior, the health beliefs are then seen as a necessary influence (Jasmi & Trygstad,1976: 8). Beliefs are matters that are

strong in the line of thoughts and understanding of a person. Originally, it is a long-term practice of health care. New belief occurs after receiving knowledge about the prevention of the disease. Sometimes, the belief is not based on basic rightness. Sometimes, it has or does not have reasons to explain it.

Also, among the Muslim people, there are a lot of daily practices that are related to health care and health behavior of the healthy. It consists of the theory of goal setting by Lewin that believes which maintain that the acknowledgement of each person means doing the thing that has benefit for them. Therefore, the acknowledgement of the person specifies the behavior of the person. When the CHD patients know they are sick, they should prevent the cause of the acuteness of the illness.

The preceding framework (Green, et al, 1980: 76-86) can explain eating behavior as well. In retrospective, the output to the input of the factors governing eating behavior of the CHD patients are divided into three categories, one of which is the predisposing factors that include the motivation of different behaviors of an individual: knowledge, beliefs, attitude, and values. These are the encouraging factors of each behavior found in the health service, the skill of self-care, and the reinforcing factors supporting health behavior such as family members, friends, and health service teams.

The Muslim's health status in the fasting period during the month of Ramadan

This section is concerned with concerns the meaning and the concepts of fasting during the month of Ramadan, the religious practices during the Ramadan, and the effects of fasting on CHD patients.

The important practice that every Muslim has to do is fasting in the month of Ramadan.   Everybody who has a full religion status should follow this practice for a period of one month, the ninth month of the Islamic calendar every.(Ratanakul & Than, 1996:78).

The concepts of fasting during the month of Ramadan

The fasting is called "As-Siyam" in Arabic which means to refrain, to hold over, and to enjoy by self width. So, the fasting in this sense means to refrain from eating, and drinking, to save the body. In doing so, every organ of the body will be far away from all bad things, physically and spiritually, from sunrise to the sunsets (Jitmoad, 1992: 62). Since fasting takes place for one month every year, the results of this practice can be utilized in the remaining 11 months. Muslims believe that this practice has self-fulfillment, leads to assistance, and has some advantages for the suffering individuals in society.

Every Muslim must perform religious rituals as soon as they become a teenage. Fasting is regarded as a necessary practice just like praying in five times a day. Parents must train their children to fast when they are young, beginning from a half-day practice until they become mature and can fast all day. There are some people that are exempted from this practice: children, insane person, the elder, chronic patients whose physician has prohibited fasting, a person who is travelling, a head worker, pregnant women and women who breast-feed their infants, those who are in the postpartum or menstrual period. The persons who are excepted from fasting have to fast at a later time to make up for the time

that they miss before the Ramadan month of the next year. Besides, they can give the same food that they eat to a poor person on the day that they miss practice.

The religious practices during the Ramadan

As for the religious practice, Muslim must fast, pray and read the Koran during the month of Ramadan.

During the fasting, the Muslims can eat only night time, after sunset and before sunrise. Therefore, they always have breakfast at 3.00 to 4.00 am. After that, they have to fast until the sunsets, Saowanee Jitmoad (1992:66) explains. After sunset, the Muslims believe that the religious prophet, Muhammad, had 1-2 date palms and drank warm water before eating because he believed eating the date palm benefits the digestive system. So, they followed the same route of practice. They eat after the Maklib pray after the sun has set. If a person practices fasting in a different way, such as by starting with main food and drinking cold water, or eating rapidly, it is believed, that it will have a bad effect on health.

In addition to the fact that the Muslims cannot eat during the fasting time, there are often regulations that prevent teasing between spouse, usual brushing of the teeth during the day time, gargling the mouth and throat, water breathing through the nose, tasting the food through the throat, and taking blood from the body without necessity. The practice that they should do is reading the Koran, while repressing love, greed, anger and refraining from being misguided. Also, they should control all of their activities and should not do, watch and listen to bad things. Therefore, the fasting in the month of Ramadan entails good practice involving physical, mental and spiritual endurance. These

Ramadan entails good practice involving physical, mental and spiritual endurance. These include learning the moral principles, and creating equality and unity. The fasting makes the mind unbiased, and prevents a person from felling melancholy and committing bad deeds.   All of these make human beings more obedient to Alloh. Baka,D. & Madairhoh,W. (1993: 89) contend that fasting enhances the system of love and mercy in the Muslim groups and protect wrong doings and disaster. Furthermore, it can prevent some diseases such as cold, diabetes mellitus, headache, and diarrhea. The fasting has a bio-therapeutic effect, too. Besides that, they believe that bacteria in the small bowel are eliminated by fasting, so fasting is a prevention and cure of gastrointestinal tract.

Moreover, the fasting in the month of Ramadan entails more religion practices in daily life style-- praying and reading the Koran that affect the body physically, spiritually and morally.

Praying is a religious practice that Muslims must perform five times a day. The praying times are in the morning before sunrise, in the afternoon, in the evening, and twice after sunset. Praying indicates loyalty to God and relationship between man and God. Muslims must clean the body before each pray. Praying also increases human goodness and it should not be forced to do.   The process of each praying may be of different, but it can clean the body, mind and soul al together.

During praying, prayers must control their mind and concentrate on God. Moreover, they stand, join their hands, bow, and gunwales, to show their respect to God. Furthermore, they must read the verses that pledge aloud. However, during the month of Ramadan, there is an additional pray (Sunah Salat) after the last pray at night. This pray

In other words, this special pray would take more or less time depending on the objectives in choosing the verse, the ability to read, the speed when it is read, and the length of the verse or chapter that has been chosen.

When discussing health, it is found that the pray has good effect on the body and mind. It can use the energy for activities and has the concentrate during pray. So, it is the same as meditation in Buddhism. There are some papers which suggest that concentration increases the secretion of endrophine that can decrease stress and anxiety as well as control some body systems for better performance (Jitsuvan, P., 1992: 92-98). However, concentration derived from praying may came from the power of faith and belief in the religion. So, the prayer who prays more during the month of Ramadan may reap benefits for their health.

Reading the Koran is an important and special activity during fasting in the month of Ramadan. It is believed that the Koran was given by god. The Koran contains the most knowledge that anybody can study and put into actual application. Muslims must read the Koran as a guidance for religious practices and life styles. The Koran is written in Arabic and is composed of more than six thousand verses. It is separated to one hundred and fourteen chapters, which are not equal in length. Moreover, the chapters are divided to thirty parts for the Muslims to read them for religious practice in the month of Ramadan. However, for any Muslims who cannot read the Koran, they can listen to it from the reader. In doing so, they will gain the same physical and mental benefits in those who can read the Koran by themselves.

Khumtaveeporn,P.& Khumtaveeporn,C (1997) studied psychological levels in the Muslims and found that subject's mental health is positive effected during the month of Ramadan.

It can be seen that fasting protects the wrong doings and promotes deeds. Moreover, fasting ensure equallity in the society and Muslims must practice fasting in the month of Ramadan.

The life style of those who fast during the month of Ramadan is different from those Muslim who do not fast. From a pilot study of 15 Muslims who fast every year, it is discovered that if they do not spend time performing the duty during daytime, they mostly rest include to anable the body to retain its strength. If they have a duty, they would do it as usual. As for workers, they would do the work that does not require much of the energy in order to prevent it from becoming weak. Farmers would also rest during the daytime; they will not do any work that requires much of the energy. People who work in the office would work as usual and they would also pray five times per day as usual. Some of them may pray more than five times as required by the religious practice. They are not allowed to cook and sell food during daytime. They will be allowed to have food together after the sunsets considered which is the time of day to be close to one another. They will buy food and cook for themselves. Some of the food eaten during this period are special and amount they consume the food is larger than that they do during the regular time when they do not fast. Sometimes, they also exchange food among the neighbors, and they always eat the date palms before the evening meal. If they cannot find date palm, they would drink water or have some sweets instead. After that, they have to

pray to prepare the body for the main food. More than 50 percent of the subjects in the pilot study continued to have food till bedtime. They slept normally in the night and they woke up to have breakfast before the sun rises. Most of them would get up earlier than usual to have food to prepare the body for fasting when the sun rises, especially for the worker who uses labor. However, this depends on an individual behaviors. Some of them who need to take medicine three times per day would take it during dinner, before bed time, and before sunrise.

A person who had peptic ulcer disease appeared to secrete increasing the amounts of gastric acid during sleep. However, the control patients with inactive peptic ulcer disease showed a decrease in acid secretion during sleep. (Walsh,J.K. et.al. 1983:11). Muslims who fast are inactive and rest for a long time day and night had the same level of secretion as peptic ulcer patients who had decreasing gastric acid. During waking hours, gastric acid secretion is determined by food, increased salivation, and the activity of the gastric vagus nerve. (Chokroverty,S.,1994:67). Also, most of the Muslims lay down, sleep, and are non active when they fast; therefore, their gastric system decreases gastric acid, too.

The different activities in daily life would have an affect on the metabolism of the body in different ways. Walshe et al (1983: 9-11) discuss the metabolism process during the sleeping time. The metabolism would be reduced during deep sleep, and it creates the change of the metabolic rate. Besides this, there are hormones that have an effect on the metabolism while sleeping such as growth hormone, thyroid hormone, and cortisone. These hormones would increase in the beginning of deep sleep, and thus, affect the

metabolism. Moreover, the thyroid hormone, which also has an effect on metabolism, is secreted more in the evening, but the secretion will stop during sleep. The thyroid-stimulating hormone (TSH) level is not dependant on sleep. Adrenocortophic hormone and cortisone that are secreted by the adrenal cortex are also inhibited when a person is sleeping. The level of these hormones will be lowest at the beginning of sleep and highest during the period from 4:00 to 8:00 am.

In addition, growth hormone, glucagon, and adrenalin have effects which, at an elementary level, are opposite to those of insulin. The precise effects of these hormones and the importance of each are not yet clear, but the overall effect is that they raise the plasma glucose and fatty-acid concentration. This latter effect increases fatty-acid entry into and usage by the body cell and thus, as a secondary consequence, spares glucose (Lamb,J.F.,1991:229).

The result of various hormones that change the chemical in the body during fasting can be learned from pervious studies investigating the substances in the body of the persons who fast. Fedial et.al. (1992: 350-353) studied 24 persons who fast during the Ramadan. They found a significant increase in TC, thyroxine, and uric acidbut TG , and gastrin, while insulin does not show any significant difference. They also found an increase in gastrin and insulin within thirty minutes after eating.

Gumaa, Mustafa, Mahmoud and Gader (1978: 573-81) found that uric acid increases with positive correlation with the increase in TG, but not with TC.

Laajam (1990: 732-6) studied 39 NIDDM patients and discovered that, there was no change in body weight and plasma glucose, but TC concentration, not TG, rose

significantly (p<.05) at the end of Ramadan. This finding is the same as that of Fedail, el al. (1982: 250-253).

Adlouni, Banslimane, Lecerf, and Saile (1997:242-9) examined 32 healthy Moroccan subjects who fasting during the Ramadan. The results show a significant decrease in TC concentration during Ramadan (7.9%, p< .001) as compared with the prefasting period. TG significantly decreases (30%, p< .001) during this fasting peroid. HDL-C has markedly increased (14.3%, p< .001) and remained so one month after the Ramadan.

Maislos et.al (1998: 127-130) studied 22 healthy subjects that fast during the Ramadan in Israel and 16 non-fasting subjects, at week 1, 2 and 4 of the month of Ramadan and again four weeks after that. Then found that HDL-C rose significantly (p< .001) at the fourth week, but returned to basal levels 4 week after the end of Ramadan. TC, TG, and LDL-C did not change significantly.

The Muslim practice of fasting signifies changes related to the metabolism. From review of literature, it is seen that the levels of fat and hormone are reduced in normal people who still have usual life. Therefore, if the CHD Muslim patients practice fasting with a good eating behavior, they would have a good effect on the body. Hence, it is interesting to study those patients who practice fasting to see how it is related to the plasma lipid, which is one of the risk factors of CHD. However, the pilot study has indicated that having food during the fast in the month of Ramadan means an increase in food preparation, cooking time, and quality and quantity of food ad well as weight gain the fasting is over. Therefore, this should be one matter that influences an increase in the

plasma lipid. It might be a cause of the disease in a person who does not show any symptoms of CHD or a person who have the symptoms but they are able to control it.

For the CHD patients that practice fasting in Narathiwat Province, they would have more time to relax when there is no full time work. That is good for the body, especially for the CHD patients who need more time to rest. The study of Chokroverty (1994: 350) points out that the ischemic heart disease has an effect on sleep and might cause other unusual symptoms such as chest pain and EKG changes, etc. Therefore, the CHD Muslim patients who practice fasting in the month of Ramadan would have more rest, and thus, more health benefits. Kripke' study (refered to the chokroverty, 1994: 351) discovers that the patients with CHD, stroke, and cancer, with a lot of sleeping time will have less acuteness and mortality. However, they should not sleep less than four hours and more than ten hours in each time they sleep. This is confirmed Wingard & Berman (as cited by Chokroverty, 1994: 351) who study 7,000 adult CHD patients who had been sick for more than 9 years. They report that the mortality rate of the CHD patients would be increased if they slept less than seven hours and more than 9 hours. Therefore, the rest of heart disease patients should be taken into consideration while they are practicing fasting.

CHAPTER 3

METHODOLOGY

Research Design

The study is a descriptive research which investigated health behaviors and plasma lipid levels in Muslim patients with coronary heart disease in fasting period during the month of Ramadan in Narathiwat Province.

Population and Sampling

The population of this study consisted of adult Muslim patients who had coronary heart disease (CHD) that attended the hospital and were diagnosed by physicians and registered in the heart clinic, Outpatients Department, at Sungai-Golok Hospital.

The subjects were 124 patients from the Outpatient Department who fast in the month of Ramadan. During this study, there were 80 subjects from whom data were collected, but only 70 subjects could participated in this study twice. Two subjects did not fast during the Ramadan, Six subjects did not show up for the second information collection, and two passed away before the completion of the data collection. There were 44 patients who did not want to participate in this study.

Research Setting

The data was elicited from Muslim patients with coronary heart disease who attended the heart clinic in the Outpatient Department of Sungai Golok Hospital on the Thursday 1 week before and 1 week after the month of Ramadan.

The heart clinic's is a special clinic that service in every Thursday at 1.00 p.m. to 4.00 p.m. The patients who come from the area in Narathiwat Province. The patients in this clinic are all of heart diseases that diagnose with physicians, and come to follow up their disease.

Research Instrument

The research instruments were composed of the three parts as follows:

1. The instrument used in collecting plasma lipid :

1.1 The Biochemistry machine that checks lipid levels in blood (OpeRa model) by The Bier Company (Thailand) Limited.

1.2 The equipment used in collecting blood sample. These were needles No.21, 5 ml syringe, tourniquet, 70% alcohol, cotton wool, and plasters.

2. The instrument to elicit health data: a weighing machine, a height scale, a watch, a spithnomanometer, and a stethoscope.

3. The instrumentssto interview and collect data are the 5 parts in the questionnaire designed especially to elicit various types of information as follows:

3.1 The personal data record--there were 16 questions to elicit personal informatiom including sex, age, marital status, family characteristics, family status, education status, income, occupation, occupational characteristics, family history of heart disease, interval period after CHD, current treatment, other personal diseases, and health status.

3.2 The recording of personal health database which consistsed of weight, height, body mass index (BMI), pulse rate, blood pressure, and plasma lipid levels. These data were collected before and after the month of Ramadan:

3.2.1 Weight -- machine weighing used the same machine, and the same person read the patients' weight.

3.2.2 BMI --calculated by the formula BMI = weight (Kgs) / height (m^2)

3.2.3 Pulse rate -- counting the radian pulse for one minute. To prevent errors, the record had to be made after the patients had arrived at the clinic and rested so as not to feel tired.

3.2.4 After counting the patients' pulse, blood pressure was checked twice with a spignomanometer and the mean was calculated.

3.2.5 Plasma lipid levels' were obtained for 5 ml of the subject's blood which was then sent to the laboratory to find the total cholesterol(TC), triglyceride(TG), and HDL-C level by a biochemistry machine. Then LDL-C was calculated with the LDL-C formula:

$$LDL\text{-}C = TC\text{-}HDL\text{-}C - (TG / 5)$$

This formula can be used for the patients who had TG of more than 400 mg/dl. If the TG was more than 400 mg/dl, the LDL-C had to be calculated with the laboratory machine.

3.3 The interview protocol was about food and the frequency of food intake in one week prior to the data collection. It was a form that asked the patients about the characteristics of Muslim's food in Narathiwat Province and the frequency of food intake

one week prior to the data collection. This form was adapted from the interview form concerning the health behaviors which were the cause of CAD constructed by Miss Monticha Anukulvuttipong (1997). This instrument was concerning with 20 kinds of food. The positive characteristic of food were numbers 3, 4, 9, 10, 11, 14, and 15 ; the negative characteristic of food were numbers 1, 2, 5, 6, 7, 8, 12, 13, 16, 17, 18, 19, and 20. The data was rated on the following four-scale Likert scale:

Answered characteristic	Standard of given score	
	positive item	negative item
Have everyday	4	1
Have 7-12 meals	3	2
Have 1-6 meals	2	3
Have not had for one week	1	1

This instrument had the scores ranking between 20 and 80. The scores were considered as follows:

between 20-35 means unsuitable eating behaviors that need to be changed.

35.1-50 means low suitable of eating behaviors that should be changed.

50.1-65 means suitable eating behaviors that should be encouraged.

65.1-80 means highly suitable eating behaviors are performed.

3.4 The interview form of daily life behaviors of the CHD Islamic patients before and during the month of Ramadan was an open-ended questionnaires which included 12 questions designed especially to elicit information concerning meals, daily work, exercise, sleeping pattern and pray before and during the fasting period in the month of Ramadan.

3.5 The interview form of the symptoms of the CHD Muslim patients a month before and during the month of Ramadan was developed based on the information derived from the literature review. It consisted of 10 questions concerning symptoms such as chest pain, management of symptoms, dyspnea, and other CHD symptoms that occurred a month before and during the month of Ramadan. The score was 1 point, if the symptoms were not found. If there was one or more unusual symptoms, the score was zero point. The total possible scores were from zero to ten points. The sum of the highest score meaned that the unusual symptoms were less and the sum of the lowest scores were more.

Validity and Reliability of Instrument

Validity

The questionnaires in form one to five were validated by five experts: a Muslim physician and instructor, a special nutrition nursing teacher, a nursing instructor skillful in the development of research instruments, a physical therapist instructor, and an instructor who taught sociology and religion. The questionnaire form five was validated by two cardiologists and an expert clinician nurse in the cardiology area.

After that, the questionnaires were rectifed accordance with recommendations until it was found to be objective before use.

Objectivity

The instruments were tried out with 30 patients who were similar to the sample group.

Data collection

The investigator followed the recommendations of the Dean of the Faculty of Nursing and was allowed to collect the data by the Faculty of Graduate Studies. Data collection took place after permission was granted.

The preparation steps taken before data collection were as follows:

1. The investigator brought the introduction document and the permission document from the Graduate Faculty, Mahidol University, to the director of Sungai-Golok Hospital. The aims and the process of the study were explained and cooperation was requested.

2. After permission from the hospital's director was given, the investigator met with the head of medical physicians and the head of the Outpatient Department. Details and procedures of this study were explained.

3. Cooperation from the physicians who provided treatment in the heart clinic was requested as the purposes of the steps in the study were explained. Cooperation was asked for, especially that concerning laboratory orders and sample an appointment with the subjects.

4. Cooperation was also asked for from the five nurses who could speak the local language to help with data collection such as counting pulse rate, checking blood pressure, and giving explanation about instruments so as to arrive at the same understanding.

5. The names and the history of CHD patients from patient records in the heart clinic of the Outpatients Department, Sungai–Golok Hospital, were investigated. After

that, the patients whose qualifications from the list of the heart clinic were desirable were chosen as the subjects of the study.

6. The support of the laboratory agent that checked the plasma lipid levels was sponsored by The E for L Company (Thailand) Limited. The director of Sungai-Golok Hospital supported a laboratory officer in blood sample analysis.

Collection of the data

1. Before the month of Ramadan

1.1 The investigator met the subjects from 10 to 20 November 1999 to introduce herself, to establish the relationship, to inform the subjects of the purposes of the study, to ask for cooperation, to make an appointment with the subjects in order to collect data, to explain to the subjects about the information and the right to withdraw at any time, to give an assurance of confidentiality, and to inform the subjects they did not have to pay for the laboratory check-ups.

1.2 When the subjects agreed to participate in this study, they were provided with the information about the practice before collecting blood sample—that they should fast after the evening meal for 10-12 hours before the day the blood was to be collected.

1.3 On the appointment days (1 to 9 December 1999 which were before the month of Ramadan of the year 1999), before they saw the physicians, the sujects were interviewed. Parts one, five, four and three of the instruments were used respectively. Then, the subjects' body weight, height, pulse rate, and blood pressure were measured and recorded. Next, the blood sample was taken and subsequently sent to the hospital

laboratory. Finally, after seeing the physician, the sample would be thanked and reminded of the next appointment.

1.4 After receiving the laboratory report, the laboratory results were recorded in the second part of the instrument.

2. After the month of Ramadan

2.1 The same steps of data collection as taken before the month of Ramadan (items 1.2 to 1.4), were followed as well as parts four, five, and three of the instrument. These data were collected from 13 to 20 January 2000, after the fasting period of the Ramadan.

2.2 The laboratory results were reported to the subjects who had abnormal level of plasma lipid by a postcard. After that, an appointment with the physician for treatment was made.

3. Finally, all data elicited from the subjects and the laboratory results were statistically analyzed.

The human right provision

To ensure the human right protection of the subjects during this study, the investigator introduced the objectives of this study to the subjects before collecting data. The subjects were informed of their right and they were told that they could request for any information from the investigator if they did not understand any part of the research. The subjects could withdraw their participation at anytime if they wished without any negative impact.

Data analysis

The analyses were done by the computer program SPSS for Windows. The steps in the analysis are as follows:

1. Measuring frequency distribution and percentage of personal data;

2. Calculating the arithmetic mean and standard deviation of the data before and after the month of Ramadan. The data include weight, height, BMI, pulse rate, blood pressure, and plasma lipid levels of the subjects. Then the plasma lipid levels data before the month of Ramadan and the data after the Ramadan were compared with the t-test; and

3. Calculating the arithmetic mean and standard deviation of the data concerning food and the frequency of food taken one week prior to fasting.

4. In part four, the content analysis (Webber, 1990) was conducted as follows:

4.1 Reviewing the data from the manifest content;

4.2 Grouping the data and categorizing;

4.3 Measuring frequency distribution and percentage of daily life behavior.

5. Calculating the arithmetic mean and standard deviation of the data before and after the month of Ramadan, concerning the symptoms of the CHD Muslim patients observed a month before and during the Ramadan.

CHAPTER IV

RESULT

This study was aimed at examining the health behaviors and plasma lipids levels of Muslim patients with CHD in the fasting period during the month of Ramadan in Narathiwat Province. The 70 subjects in this study were diagnosed by the physicians and treated at the heart clinic of Sungai-Golok Hospital. In this chapter the results will be presented as follows:

1. The demographic data of the subjects is represented in term of frequency distribution and percentage in Table 1 – Table 3.

2. The results of research questions are discussed as follows:

2.1 A comparison of the arithmetic mean score and standard deviation (S.D.) of body weight, BMI, pulse rate, blood pressure and plasma lipid level before and after the month of Ramadan is presented in Table 4.

2.2 The results of arithmetic mean score and standard deviation and t-value of eating behavior one week before and during the month of Ramadan are depicted in Table 5 – Table 7.

2.3 The daily activities before and during the month of Ramadan were analyzed by content analysis as shown in Table 8 – Table10.

2.4 The scores of symptoms detected before and during the month of Ramadan represented by arithmetic mean and S.D. are displayed in Table 11.

1. Demographic data

Table 1 Frequency and percentage of demographic data (n=70)

Characteristics	Frequency	Percentage
Sex		
Male	43	61.4
Female	27	38.6
Age(year)		
<50	11	15.7
51-60	26	37.1
61-70	20	28.6
>70	13	18.6
Marital status		
single	3	4.3
married	56	80.0
widowed / divorced	11	15.7
Family type		
nuclear	27	38.6
extended	43	61.4
Family status		
leader	41	58.6
member	29	41.4

As shown in Table 1, there were 43 male subjects (61.40 %) and 27 female subjects (38.30 %). The mean age was 60.54 years with the standard deviation of 10.65, ranging in age from 38 to 85 years. The majority of the subjects were married (80 %), and most of them had an extended family. Forty-one subjects (58.60 %) were the family leaders.

Table 2 Frequency and percentage of demographic characteristics (n=70)

Characteristics	Frequency	percentage
Education level		
Primary	27	38.6
Secondary	7	10.0
Diploma	1	1.4
Other	8	11.4
No education	27	38.6
Income per month (Baht)		
<4,000	34	48.6
4,001-10,000	11	15.7
10,001-20,000	7	10.0
>20,000	4	5.7
Not specified	14	20.0
Adequacy of income		
adequate	54	77.1
inadequate	16	28.9
Occupation		
agriculture	9	12.9
officer	1	1.4
merchant	9	12.9
labor	11	15.8
no occupation (Unemployed)		
house work	32	45.7
no working	8	11.4
Characteristic of work		
involving exerting energy	10	14.3
involving walking	8	11.4
involving more exerting energy	12	17.2
Payment of treatment		
own payment	7	10.0
reimbursement from workplace	14	20.0
government health assurance	25	35.7
social security	1	1.4
senior citizen card	18	25.7
others	5	7.1

In Table 2, 27 subjects (38.6 %) had a primary school education and 27 subjects

had no education. There were 34 subjects (48.6 %) whose income was less than 4,000

Baht per month. More than half of the subjects had adequate income (77.1 %), while half

of them did not occupation (57.1 %). There were 15.8 percent who worked as a labor.

There were 35.7 percent who used government health assurance to pay for treatment.

Table 3 Frequency and percentage of CHD history and health status of the subjects (n=70)

Characteristics	Frequency	percentage
CHD in family		
father	4	5.7
mother	3	4.3
father and mother	3	4.3
younger brother / sister	1	1.4
do not know	59	84.3
Duration of diagnosis		
less than 1 year	7	10.0
1-5 years	43	61.4
6-10 years	15	21.4
more than 10 years	5	7.2
Type of treatment of CHD		
in clinic / hospital	68	97.2
traditional medicine- in clinic / hospital	2	2.8
Other disease with CHD		
Hypertension (HT)	16	22.9
Peptic ulcer (PU)	7	10.0
HT and Arthritis	5	7.2
Arthritis	3	4.3
Asthma	3	4.3

Table 3 Frequency and percentage of CHD history and health status of the subjects (cont.)

Characteristics	Frequency	percentage
Other disease with CHD (Cont.)		
HT and DM	6	8.6
HT and Asthma	2	2.9
Arthritis and Asthma	1	1.4
Arthritis and PU	1	1.4
HT, DM, Arthritis and PU	1	1.4
HT, DM, Arthritis and Asthma	1	1.4
HT, As and Arthritis	1	1.4
no other disease	23	32.9
Score of health status		
3- 5	15	21.5
5- 7	41	58.5
7-10	14	20.0

As shown in Table 3, there were 59 subjects (84.3 %) who did not know whether anybody in their family had CHD.   Forty-three subjects (61.1 %) had been treated for CHD from 1 to 5 years.   Almost all of them sought treatment at a hospital or physicians' clinic (97.2 %). Sixteen subjects (22.9 %) had hypertension and 24 subjects did not have other diseases. In this interview, the investigator gave the sample to assess and give score for their health status. Most of their health status was rated between 5 and 7 (58.5 %).

2.The result of research question

This topic represented about health behaviors and laboratory results. The comparison of mean score and standard deviation (S.D.) was conducted for data concerning body weight, BMI, pulse rate, blood pressure and plasma lipid level, as shown before and after the month of Ramadan. Next, it reports on the results of score frequency, percentage and t- value of eating behavior one week before and during the month of Ramadan. Lastly, it shows the daily activities before and during the month of Ramadan were analyzed by mean of content analysis.

Table 4 Mean, standard deviation and comparison of body weight, BMI and plasma lipids before and after the month of Ramadan (n=70)

Data	Before the Ramadan		After the Ramadan		t	p
	mean	S.D.	mean	S.D.		
Body weight	57.65	15.98	55.97	15.89	2.68**	.009
BMI	22.02	8.19	21.08	5.90	1.59	.115
PR	74.40	11.01	73.44	10.01	0.06	.949
SBP	132.29	17.38	129.14	15.39	1.37	.176
DBP	83.00	10.59	82.29	12.18	0.42	.675
Cholesterol	247.46	52.01	256.14	59.70	1.33	.188
Triglyceride	166.49	80.16	166.98	84.98	0.05	.963
HDL-C	56.17	15.01	59.74	13.44	2.14*	.036
LDL-C	157.30	46.64	165.99	48.00	1.66	.101

* p< .05 , ** p<.01

From Table 4, it can be seen that the mean score of body weight, body mass index (BMI), Pulse rate (PR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) decreased after the month of Ramadan. On the contrary, cholesterol, triglyceride, HDL-C and LDL-C increased. HDL-C was significantly different (p<0.05).

Table 5 Frequency and percentage of eating behavior one week before fasting

Eating behavior	Frequency	Percentage
35.1-50 low suitable eating behaviors.	1	1.4
50.1-65 suitable eating behaviors	56	80.5
65.1-80 highly suitable eating behaviors	13	18.5

Before the month of Ramadan, 56 subjects (80.50%) had the score of 50.1 to 65

that means suitable eating behaviors.   Only one subject's eating behavior was low

suitable.

Table 6 Frequency and percentage of eating behavior in last one week fasting

Eating behavior	Frequency	Percentage
50.1-65 suitable eating behaviors	65	92.5
65.1-80 highly suitable eating behaviors	5	7.5

During the month of Ramadan, most of the subjects (92.5%) had suitable eating

behaviors.

Table 7 Mean, S.D., and comparison of eating behavior before and during fasting

Eating behavior	mean	S.D.	t	p
before the month of Ramadan	61.84	5.224		
after the month of Ramadan	59.67	4.478	3.05**	.003

**p< .01

Table 7 shows that the mean of eating behaviors before the fasting of Ramadan is

higher than that of during the month of Ramadan with a significant difference (p< .01).

Table 8 Daily activity of subjects (n=70)

Activity	Before the month of Ramada		During the month of Ramadan	
	frequency	percentage	frequency	percentage
Exercise	30	42.9	19	27.1
running	5	7.1	0	0
walking	26	37.1	17	24.3
riding bicycle	2	2.9	1	1.4
weight lifting	0	0	1	1.4
No exercise	40	57.1	51	72.9
Frequency of exercise (days per week)				
1-4	3	4.2	3	4.2
5-7	27	38.7	16	22.8
Duration of exercise (minutes per day)				
< 20	9	12.9	13	18.4
20-30	16	22.9	4	5.7
31-60	4	5.7	2	2.8
> 60	1	1.4	0	0
Number of Meals (per day)				
1	3	4.3	0	0
2	20	28.6	59.	84.3
3	43	61.4	6	8.6
> 3	4	5.7	5	7.1

As shown in Table 8, before the month of Ramadan, most of the subjects did not exercise (57.1%). There were 30 subjects (42.9%) who usually exercised except during fasting in the month of Ramadan. Only 27 % exercised during that period. Walking was the first exercise chosen by them both before and during the month of Ramadan (37.1%, and 24.3%). At both times, they exercised from 5 to 7 days per week (38.7%, and 22.8%). Before the month of Ramadan, they (22.9%) exercised for 20 to 30 minutes per day, and during the fasting, they(18.4%) exercised for 10-20 minutes per day. Most of them (61.4%) had 3 meals in one day before the month of Ramadan and during the fasting they (84.3%) had 2 meals per day.

Table 9 Daily activities of subjects

Activity	Before the month of Ramadan		During the month of Ramadan	
	frequency	percentage	frequency	percentage
Praying (times per day)				
5	64	91.4	27	38.6
> 5	6	8.6	43	61.4
Taking a daytime nap (minutes)				
< 30	13	18.5	8	11.5
30- 60	23	32.9	17	24.3
61-120	15	21.4	13	18.6
> 120	1	1.4	8	11.4
laying down almost all day	0	0	8	11.4
no nap	18	25.7	16	22.9
Night time's sleep (hours)				
5 – 6	18	25.8	36	51.5
7 - 8	33	47.1	24	34.3
9 –10	17	24.2	8	11.5
> 10	8	2.9	2	2.9
Sleeping consistency (times waking up in the middle of the night)				
1	16	22.9	14	20.0
2	15	21.4	15	21.4
3	5	7.1	3	4.3
>3	3	4.2	1	1.4
deep sleep (with no waking up)	31	44.3	37	52.5

In Table 9, most of the subjects (91.4 %) usually prayed five times per days , but during the month of Ramadan, 61.4 percent prayed more than five times per day. As for sleeping, before the month of Ramadan, most of them (32.9%) take a nap for 30 to 60 minutes. In the night, they (47.1%) slept for 7 to 8 hours and some (22.9 %) woke up one time during the night. During the fasting in the Ramadan, they (24.3%) took a nap during the day for 30 to 60 minutes, while 22.9 % did not. Most of them (51.5 %) slept for 5 to 6 hours at night and 41.4 % woke up 1 to 2 times the middle of the night.

Table 10 Daily activities of subjects

Activity	Before the month of Ramadan		During the month of Ramadan	
	frequency	percentage	frequency	percentage
Bathing	70	100.0	70	100.0
Eating	70	100.0	70	100.0
Watching TV	54	77.1	37	52.9
Talking with neighbors	53	75.7	35	50.0
Buying things	30	42.9	15	21.5
Cooking	19	27.1	18	25.7
Cleaning floor	16	22.9	16	22.9
Sweeping floor	13	18.6	21	30.0
Gardening	12	17.1	11	15.7
Selling things	10	14.3	5	7.1
Washing clothes	8	11.4	9	12.9
Slitting rubber	8	11.4	5	7.1
Tending to a child	5	7.1	3	4.3
Tending to chicken	3	4.3	2	2.9
Working in an office	2	2.9	2	2.9
Tending to cow	1	1.4	2	2.9
Going to mosques	0	0	39	55.7
Reading the Koran	0	0	36	51.4
Scores of effects on subject's health in the month of Ramadan				
3 – 5			9	12.8
6 - 7			37	52.6
8 –10			24	34.3

In this table, the top five activities before the month of Ramadan are sitting, watching television, going out to buy things, cooking and cleaning floor (97.1 %, 77.1 %, 42.9 %, 27.1 %, and 22.9 % respectively). During the fasting in the Ramadan, the top five activities are sitting, watching television, going to the mosques, reading the Koran and talking with the neighbors (91.4 %, 52.9 %, 55.7 %, 51.4 %, and 50.0 % respectively).

Most of the sample (52.6 %) gave the scores of 6 and 7 to specify how the fasting during the month of Ramadan had effects on their health.

Table 11 Mean, standard deviation of symptoms before and during the month of Ramadan

Score of symptoms	mean	S.D.	t	p
before the month of Ramadan	6.14	2.16		
after the month of Ramadan	7.14	2.68	3.17[**]	.002

[**] $p < .01$

As shown in Table 11, the mean score of most of the subjects' symptoms during the month of Ramadan is higher than that of before the month of Ramadan, with significant difference.

CHAPTER V

DISCUSSION

The purpose of this descriptive research was to study health behaviors, plasma lipid levels and the CHD symptoms, and to compare the plasma lipid levels examined before and after the month of Ramadan. The data was analyzed by the SPSS program and presented in terms of frequency, percentage, mean, standard deviation, and comparison by a t- test. The result was discussed as follows:

1. Health behaviors before and during the fasting during the month of Ramadan in CHD Muslim patients

The health behaviors in this study refer to health behaviors before and during the month of Ramadan, which include eating behavior, activities, exercises, and religious practice. The discussion for each of the behaviors are as follows:

1.1 The heath behavior before the month of Ramadan

The findings of this study reveal that the mean score of eating behaviors was considered suitable eating behaviors. Most of the subjects did not work as usual and less the half of them exercised. All of the subjects performed religious practice which was praying 5 times a day. The discussion are as follows:

1.1.1   Eating behavior

It was found that the mean score of eating behavior was considered suitable eating behaviors (X=61.84, S.D.=5.22). Most of the CHD patients knew the kind of food that they could and could not eat because 90 percent of the subjects had CHD for more than 1 year, so they had learned to adjust their life styles. This agrees with the finding of Jirawan Inkoom's study (1998: 60). In addition Kottket (1982:60-62) points out that the duration of the illness can help patients to adapt themselves and it also leads to a change for good health behaviors and good quality of life.

During data collection, the elderly patients, in particular could eat only a few kinds of foods in each meal and they preferred soft diet. For example, they usually selected soup, but they chose few dishes with meat because it (beef) was difficult to chew and digest. Eighty-two percent of the elderly knew what foods affected their illness. Moreover, it was found that the measure of eating behavior of male subjects score (X=61.58, S.D.=5.83) was higher than that of female subjects (X=62.25, S.D.=4.01) (Table 14). The result seems to indicate that most men like to eat meat and animal entails. Besides, most women in the rural society, and women especially in an Islam society, feel that they must keep better food for the men and other family members. Most of the good food is cooked with beef that is the considered good culturally, but beef contains the highest cholesterol. Since, the women had to keep better for men, their score is better than that of men.

1.1.2   Activities and exercises

It was found that 57.1 percent of the subjects did not work as usual, so they had more time for housework. Most of them could had functional class I and II, which could be assessed with the symptoms of the patients when they went to see the physician in the hospital. Moreover, 47.14 percent were the elderly that lived in an exteneded family, so they could help with some of the housework such as taking care of a child, preparing the food for cooking, and bolting the clothes. Hamton & Pickett (1984:434) contend that an elderly who is able to help with the housework in an extened family, although they do not usually work, have a chance to promote their health.

As for exercise, it was found that 42.9 percent of the subjects exercised on the regular basic. Most of them exercised for 20-30 minutes, 5-7 times per week. They chose walking as a form of exercise which could be very easy and light walking. Moreover, based on the interview, it was discovered that they believed walking was good for their health and posed no danger to their health when they were old. This reason is the same as the reason that Doungjai Plianbumroong (1997: 35) discovered when studying health behavior in the elderly who lived in border provinces in the south of Thailand.

1.1.3   Religious practice

The Muslim religious practice that they perform everyday is praying 5 times a day. During each pray, the prayer stands, bow, and sits to bow many

times during one session. The time that they spend praying depends on the speed they read the verses, the article that they add into each pray, and the numbers of verses.

However, there are two benefits of praying. First, it is good for physical health because it increases the activities for the prayers when they pray. Furthermore, it benefits mental health, for it can decrease stress due to concentration needed for each prayer. All of the subjects prayed in their house.

1.2 The health behavior during the month of Ramadan

As regards the fasting in the month of Ramadan, the mean score of eating behavior is less than that of before the fasting. They exercised less than before the fasting too. Nevertheless, when it came to religious practice, they increased the prayers in the evening, went to a mosque that was near their house, and read the Koran during the day. These can be discussed separately as follows:

1.2.1   Eating behavior

The mean score of eating behavior was also considered suitable eating behaviors which was the same as before the fasting, though lower (X=59.67, S.D.=4.48). Besides that, the percentage of the subjects (7.5%) who had suitable eating behaviors during the fasting was lower than the percentage (18.5%) of those who had suitable eating behaviors before the fasting. The eating score decreased because there were a lot of special foods available during this period. These were food made from beef, coconut milk, egg, and etc, and beef is especially high in cholesterol. The processes of cooking were frying and deep frying. So, both the process and the kind of food could increase fat in the body. Moreover, they ate more

in the evening during the month of Ramadan because they had to fast for a long period of time (more than 12 hours) during the day. Before the evening meal, when the sun sets, they started their meal with date palms or desserts, then they had dinner after they finished praying. Most desserts were made from flour, egg, coconut milk, and coconut sugar, which are a source of fat in blood. (Tunpijitr,W. 1998:652).

Moreover, when one family had special food, they would exchange it between families, so there was more than enough food in the evening meal. The CHD patients would then eat the same kind of food as the others in the family. That is the life style in a rural area, which has long been established and is difficult to change. Nevertheless, the religious practice entails that Muslim can choose something to eat that is good for their health.

The CHD patients should be concerned about choosing food that would benefit their health. However, most of the subjects had had CHD for more than 1 year, so they knew what kind of food that they could, and should, eat. Because when they went to see the doctor, the health care team gave them some health education, though probably without some details. Although most of the subjects had primary education (38.6%) and no education (38.6%), they knew what they could not eat such as salty food and what they could eat such as low-fat diet. However, they did not know what kind of food has high fat and salt content. On the other hand, if the health care team provides them with main education in full details, it would be best for these patients' health.

In addition, it was found that some subjects continued to eat even after dinner until they went to bed. However, although there is no religious rule, which states that having other meals is right or wrong, but it dose emphasize that the Muslims must choose the best food for their health. As such, they should select good eating behaviors for their health in this period . What's more, they still liked to drink coffee, though less than before the month of Ramadan.

1.2.2   Activities and exercises

As for daily activities the subjects did less work but more housework. They watched television and talked with the neighbors and they most wanted to nap, rest and sleep in the daytime. The subjects explained that they wanted to save the energy, and they did not want to feel tired when they fast during the day. Moreover, they did not want to exert energy to do anything. During the day of the fasting, they mainly rested, sat, and performed their religious practice.

The subjects who were officers (2.9%) still performed their usual work, but those who were self-employed or had their own business (50%) such as merchants and gardeners, stopped their work and rested at their home. Some of them had other persons in their home help with their housework.

Concerning exercise, it was found that the subjects exercised less during the fasting (27.1%) lower than before the month of Ramadan (42.9%). The reason was that most subjects did not want to exert energy while fasting during day-time. However, subjects who exercised (27.1%) decreased their time for each exercise; they spent about 10 minutes in each exercise.

Most of them believed that walking around their house was enough for exercise. However, their exercise could not be considered the right exercise that was benificial for their heart, but it was ideal for the body to use some calories and increase metabolism. This is because during the fasting period, the body may use fat metabolism for energy. While collecting the data, the investigator asked the subjects about their exercises, and their answer was not clear. This may be because exercise is not a main activity in a Thai life style and exercise receives even less attention in the rural areas and among people with low education. Therefore, the health care team must promote exercise and give full education to people, especially those with CHD because some people know that they need to exercise but they do not how to exercise or which exercise is not dangerous and what is good to their health and their heart. So, the information about duration of exercise, frequency, appropriate type of exercise, and aerobic exercise that is best for health should be provided by the health care team, as well as how exercise can decease the plasma lipid (Wongmaneekul,I. 1993: 7; Chaidaisook,Y. 1996: iv).

One interesting finding is that, the subjects increased their activity during this period because most of them walked to the mosque everyday after dinner and they considered that walking a form of exercise although it was a short time only.

In addition, 77.1% of the subjects rested more during daytime in the month of Ramadan than they did before this period. This supports the explanation that they wanted to save energy. There were 11.4 percent who laid down almost all

day and decreased the time of sleep at night. It may be because they already had a long time of rest during daytime. Moreover, they needed to wake up very early to eat before sunrise, so the sleep time at night decreased as well. It is interesting that they could have a deeper sleep than they did before the fasting. An explanation is that they did not wake up during the night because of a lack of necessity to urinate and they could sleep continuously.

1.2.3   Religious practice

They increase religious practice and became strict. They had more practice during the fasting than they did before the fasting, which increased from 8.6 % to 61.4%. The practices included praying, going to the mosque, and reading the Koran, which had an effect on the Muslims' health, both physical and mental, and it could help them relax during fasting in the day time. The relaxed mentality dose not have any effect on the whole body organ. There are some studies which found that stress can increase plasma lipid level, especially nor-epinephrine that has an affect of changing free fatty acid from adipose tissue to the blood circulation (Price, 1982: 137; Fredman & Rosenman, 1959, 1987)

Moreover, the sample had a special prayer which was different from those they normally did. They had to stand up, bow and sit for 12-23 cycles and it took 30 minutes to two hours to performance this special praying, depending on the speed when they read the verses in the Koran, the article that they added in to each prayer, the body's efficiency and the number of prayers. However, this prayer similarly increased the activity that exerted energy and made them move more than

they did while resting all day. The pray is also the same as meditation that increases endrophine which in turn can decrease mental stress.

Besides, half of the subjects (51.4) spent daytime on reading the Koran to relax while fasting. However, the religious practice dose not compel everybody to read the Koran. So, reading the Koran is a matter of personal preference.

2. Study and comparison of the plasma lipid levels before and after the month of Ramadan

The plasma lipid in this study refers to total cholesterol (TC), Triglyceride (TG), High-density cholesterol (HDL-C), and low-density cholesterol (LDL-C). This section discusses the lipid levels before and after the fasting. These are as follow:

2.1 Plasma lipid levels before the month of Ramadan

In this study, the mean of plasma lipid levels refer to mean cholesterol (TC) 247.46 mg/dl, mean triglyceride (TG) 166.49 mg/dl, mean high-density choesterol (HDL-C) 56.17 mg/dl, and mean low-density cholesterol 157.30 mg/dl. This data indicates that TC, TG, LDL-C are higher than normal, so they are related to the lipid in plasma and risk of CHD.

As for HDL-C that is higher than normal, it is good for health because it can take the cholesterol and free fatty acid to be metabolized at the liver. It changes

the fatty acid to bile salt and secrets bile product and reduces fatty acid to lipoprotein and back to blood circulation.(Wichaidit,S. & Tunpijitr,W. 1985: 83; LeelahaKul,V. & Taveeboon,T. 1998:26-40). Besides, HDL-C may increase because 42.9 percent of the samples exercised.

Although HDL-C was high, if TC / HDL-C (4.4) and LDL-C /HDL-C (2.8) ratio (Table 15) were higher than the normal values (TC / HDL-C =3.5 and LDL-C /HDL-C=2.5) the risks and severity of hyperlipidemea will increase.

2.2 Plasma lipid levels after the month of Ramadan

Two pieces of evidence can be used to discuss lipid levels after the fasting. First, the changes of lipid after fasting is HDL-C. It significantly increased (p < .05). TC, TG, LDL-C after the fasting were higher than before the fasting, but the difference is not significant (p> .05). They can be discussed as follows:

2.1.1 The plasma lipid levels that significantly changed was HDL-C

HDL-C is a good cholesterol that increases during the month of Ramadan. It may increase as an effect of more religious practices and decreased stress during the fasting. An increase in HDL-C is good for health because it can take other kinds of fat out of the body. In addition, the subjects who exercised, it was found that HDL-C was significantly different before and after the fasting (p< .05) (Table 16). Furthermore, in the other study, high HDL-C can control plasma TG   (Tunpijitr,W & Leelahakul,P. 1998:656). In this study the mean of TG before and during fasting did not changed.

There are some studies that support this finding that HDL-C increases after the fasting in the month of Ramadan. Maislos et. al. (1993, 640-642) who studied healthy subjects found that HDL-C was 30% higher (p,0.005) at the end of Ramadan. They reported their study in 1998 (1998, 127-130) that HDL-C rose significantly (p< .001) at the fourth week and returned to the basal level four weeks after the end of Ramadan.

Moreover, Aalouni, A. et al. (1997:242-9) found that HDL-C had markedly increased (14.3%,p<.001) in the healthy group of subjects.

However, in this study, it was found that for the subjects who ate only two meals a day, HDL-C increased significantly (P< .01), but for the subjects who ate more than two meals a day, there was no significant difference (p> .05). It may be because they ate too much food during this period, so they had the eating behavior score lower than that of the sujects who ate only two meals a day.

2.1.2   The plasma lipid levels that did not change were TC, TG, and LDL-C.

There is no significant difference in TC, TG, and LDL-C. (p> .05). Their increases are related to the eating behavior score that decreases because the subjects had suitable eating behavior during the fasting. They ate more food that could increase fat than they did before the month of Ramadan. So, it affected the plasma lipid when checked at the end of fasting. Moreover, they ate more meals after sunset and larger quantity of food during this period, which also had an effect on plasma lipid. There are some studies on eating high fat diet which found that

for those who eat less than 30 percent of fat, plasma lipid level will decrease (Somjai Wichaidit, Wichai Tanpijitr and Tongsak Srianuchat,1986:90). This finding is consistent with previous studies because the eating behavior decreases but plasma lipid level increased. In addition, cholesterol that has been increased is from meat (beef) and saturated fat from coconut milk.

There are some finding of past studies that are consistent with the result of this study: there was no change in TC, TG, and LDL-C. Maislos et.al. (1993:640-642; 1998:127-130) found that TC, TG, and LDL-C did not change among the healthy volunteers who fast in the month of Ramadan.

In the present study, there is no significant difference between the subjects who ate two meals and three meals in one day. However, the samples who did not exercise showed a significant difference in TC (P< .05), and LDL-C (p< .05). This may result from lack of exercise which led to no metabolize fat during the fasting period of CHD patients who were cautious about saving energy to protect their health. This finding agrees with those of Fedial (1982:350-353) and Laajam (1990: 732-736) which found no significant increase in the levels of TC and TG.

However, there was no study that found out whether the length of the adaptation of eating time had any effect on health, especially the effect of metabolism on people who fast. Therefore, further research is necessary to find out about this issue because the fasting period in a day is long and thus, it should have some effects on the body systems.

3. CHD symptoms before and during the month of Ramadan

The symptoms during the month of Ramadan were fewer than those before the month of Ramadan, as shown by the symptoms score in Table 11. This finding will be explained as the symptoms before the fasting and the symptoms during the fasting as follows:

3.1 The CHD symptoms before the month of Ramadan

The mean score of the symptoms is 6.14. There are 65.7 percent of the subjects who have chest pain than any other symptoms in one month prior to the study. The group that had no occupation had more symptoms than those with occupation. A reason that can support this finding is that the non-occupation group had higher than mean age (X=65.3, S.D.=10.29) than that of the group with occupation (X=54.2, S.D.=7.4). Moreover, the no-occupation group had been sick for more than 5 years, longer than the occupation group.

3.2 The CHD symptoms during the month of Ramadan

The score of symptoms during the month of Ramadan   (X=7.14, S.D.= 2.68) is higher than that before the month of Ramadan which means that there are fewer symptoms before the fasting. This is consistent with the religious practice that increases because they can relax while fasting during the day. This can; consequently, decrease the CHD symptoms. Furthermore, the symptoms are in agreement with blood pressure and pulse rates that decrease during fasting.

The decreasing pulse rate affects the function of vagus nerve (Brow&stubbs, 1983:422). When they exercise, blood pressure and pulse rate may decrease, and this is an indication that can be measured by the decreased metabolism of the heart.

In addition, the mean score of each item during the fasting was lower than that of before the fasting, especially that of the group that had no occupation. It may be that this group has more stress due to difference in life style.

Moreover, the symptoms during the month of Ramadan decrease because Most Muslims might have more religious practice that may affect to their health. However, they may have more practice and do not observe their symptoms. There are 86.9 percent of the subjects who gave a score than five to confirm that the practice during the month have good effects on their health.   So, Khumtaveeporn,P.& Khumtaveeporn,C (1997) suggest that there are no symptoms in the healthy subjects and they more a good mental health during the month of Ramadan.

CHAPTER 6

CONCLUSION

Summary of the Study

The study is an investigation of health behaviors and plasma lipid levels in Muslim patients with CHD during the fasting in the month of Ramadan, which is a descriptive research whose purposes are to study health behaviors, plasma lipid levels, and the symptoms during the month of Ramadan, and to compare the plasma lipid levels before and after the fasting.

The samples were the CHD Muslim patients who had been treated at the heart clinic at Sungai-Golok Hospital, Narathiwat Province. There are 70 subjects who gave full cooperation in data collection. The investigator collected the data a week before and a week after the month of Ramadan. There are five parts of the research instruments, which is an interview protocol. The data collected were analyzed with the SPSS program and presented in the forms of frequency distribution, the percentage, while the data concerning plasma lipid level between before and after the month of Ramadan are compared with the t-test. The results are as follows:

1. Most of the samples (37.14%) were between 51-60 years old, with the mean age of 60.54 years old. Sixty-one point forty percent were males and thirty-eight point sixty were female. Most of them were married (80%), had an extended family (61.40%), and were the leader of the family (58.6%). Most finished primary school (38.6%), and the percentage was equal to non study. Generally, the subjects did not work. There are 48.6

percent of the subjects whose income was lower than 4,000 Baht per month, and 77.1 percent had adequate incomes. Most of them (35.7%) paid for the treatment by government health assurance.

Most of the subjects (84.3%) did not know which family member had CHD. Most of them had CHD for more than 1-5 years. Most of them (97.2%) had been treated at a hospital or a physician's clinic. There are 39.2 percent of them had not been other diseases with CHD and hypertension is the diseases that subjectss (22.9%) have accompanied with CHD. There are 58.5 percent who rated their health with the scores 6-7.

2. The eating behavior score was significantly different (p< .01) before and during the month of Ramadan, but the mean score before fasting (X=61.84, S.D.=5.22) was higher than that during fasting (X=59.67, S.D.=4.48). However, they are consiered suitable eating behaviors.

3. The plasma lipid levels that have increased after fasting are TC, HDL-C, and LDL-C. An important cause for this probably is the fact that they ate special diet and larger quantity of food. One of the lipid that significantly increased is HDL-C (p<0.05) before and after the month of Ramadan. It may be because they had more religious practice, which increased their activity and relaxation that can increase HDL-C.

4. The subjects still had a daily activity during fasting as they did before fasting. However, they increased the time that they spent resting and sleeping during the day because they did not want to get tired during fasting. So, most of them increased their exercise. Moreover, they increased their religious practice all day such as going to pray at the mosque and reading the Koran. More religious practices during this time had some

effects on the body --having more activities and decreasing their stress while they were fasting. So, they could relax when they had their religious practice.

5. The samples had fewer CHD symptoms during fasting in the month of Ramadan than they did before fasting, and the blood pressure and pulse rate decreased during fasting as well. It may be due to more rest and more relaxation in the fasting time.

Implication and Recommendations

There are three topics that are implication to nursing practice and nursing education

1. The implication and recommendation for nursing practice

1.1 The findings reveal that the plasma lipid levels increase during fasting, so the nurses should take signs and symptoms after the fasting period, into consideration. Besides, nurses may give health education to the patients who fast, by working cooperatively with the religious leader in the area. The education should be about health promotion during fasting. Nurses may also give the details and the adjustment of the health during fasting, the details of food selection, and the details of exercises during fasting that benefit these people. Most importantly, the information concerning factors that have effects on the plasma lipid levels should be provided, especially exercise that can increase HDL-C and decrease TG. In addition, praying performed in the evening, which increases exercise as well as mental concentration should also be promoted.

As such, nurses and the health care team may visit Muslim patients with CHD at their home during fasting to follow up on their practice after giving the education.

Moreover, nurses may join the CHD patients to find the way that is good for their health when they fast by having the patients as the center.   For example, they can find some time to exercise when they fast. The Muslims may exercise after the morning pray before they fast, or exercise after the last pray when they come back home before they go to bed or two hours after dinner.

1.2   Nurses and physicians in the vicinity area may have to share the strategies with the Muslims that have the same life style to promote health and prevent the risk factors of CHD. They may invite adults that have no CHD to join the health care team to come up with a strategy to use fasting to give more benefits to their health, while at the same time not doing anything against religious practice, and disseminate the information to the people who fast in the month of Ramadan.

1.3   They should set up a consulting clinic on health problems, especially those occurring during the fasting period for Muslim patients. Moreover, the hospital may have direct telephone services for this purpose.

1.4   The health care team may use the fasting technique with the other groups of patients who fast before the fasting begins. Besides that, it may use the same technique with the hypertension patients because this study as found that the blood pressure decreases after fasting. However, this benefit of fasting should be carefully studied and reviewed before it is applied to a large number of patients.

1.5   They should find the early cases of patients who have the sings and symptoms during fasting. After that, the physician can treat them at the early stage.

1.7   They should let the subjects and the Muslim groups know the results of this study concerning fasting in the month of Ramadan so that they would understand what is beneficial to their health and what is not.

1.8   Moreover, when providing education to the other groups of patients or other people, the nurses and health care team should not forget to give the details that are important about how to choose the exercises that suit their life style such as how effective each exercise is, how often they should exercise, the type of exercise suitable to their health needs, and the safety in their life when they exercise. Moreover, the health care team must promote exercise in every group that they contact because Thai people do not exercise in their everyday life.

1.9   Nurses should provide education to relatives who have to take care of CHD patients about health promotion, especially eating behavior during the month of Ramadan.

2 Implication for nursing education

2.1   The gist of this study may become a cause for nursing students in a vicinity area to take the differences of various groups of patients they are caring into consideration. These differences include culture and life style that have effects on health. Moreover, this understanding may help raise the quality of nursing as well as quality of health in different cultures.

2.2   Nursing students should be concerned with the importance and sensitivity among different cultures, because they have to work with patients with different backgrounds, cultures, and characteristics.

Implication for future studies

This study is applicable for future studies that place their focus on the same group of subjects, the same conditions of the other groups of subjects as well as studies of the other topics that are related to health behaviors in the month of Ramadan.

1. The nursing research of same group of subjects

1.1 To follow up on the lipid levels in the CHD Muslim patients after fasting month. The change in plasma lipid levels should be studied so as to provide early prevention for patients who have risk of hyperlipidemea, which can treat with eating programs, exercise, and medicine at the early stages.

1.2 To study the differences in health behaviors of the CHD Muslim patients who receive health education program before fasting and those who do not receive the education.

2. The nursing research of the same condition in other groups

2.1 To study the eating behaviors related to other diseases that can be affected by eating during fasting such as hypertension, obesity, and diabetes. After that, the strategies to educate the patients should be found if there is any problem occurrs during this period. Moreover, risk factors of CHD in different groups of subjects such as healthy subjects, female subjects and elderly subjects who are Muslims and fast should also be studied.

2.2 To study the symptoms of other diseases and to find the differences of the symptoms especially during the fasting.

2.3   To discover the mortality rate of the people and patients who die during fasting, and after that, to study what is related to the cause of the death.

2.4   To apply the religious practice with the patients' life style.   This is because religious practice can increase relaxation and eating in other groups of patients, patients with other religions, and healthy people as well.   The health benefit that they receive after they have adopted religious practices should also be studies.

3.   To study the characteristics of special food that is in the southern provinces of Thailand and to analyze the effects of such food on health.   This can be the basic of education to be given to the patients who have the same life style.

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APPENDIX

Appendix A : List of experts who validated the instrument

Appendix B : The consent letter form and the data collecting instrument

Appendix C : The nutrient composition

Appendix D : The compendium of physical activity

Appendix E : Lipid Measurement

Appendix F : The tables showing other values presented in Chapter V

List of experts who validated the instrument

1. Assoc.Prof.Dr.Venus Leelahakul

    Department of Fundamental Nursing, Faculty of Nursing, Mahidol University.

2. Dr.Chanokporn Jitpanya

    Faculty of Nursing, Chulalongkorn University.

3. Dr.Suthep Hayeesalaeh

    Medicine department, Narathiwatrajchanakarindhra Hospital.

4. Asst.Prof.Pichet Kalamkasait

    Department of Humanisties, Faculty of Social Sciences and Humanities, Mahidol University.

5. Asst.Prof.Preamjitra Jarernkul

    Department of physical therapy, Faculty of Medicine, Siriraj Hospital, Mahidol University.

6. Asst.Prof.Dr.Ongkan Raungratanaamporn

    Her Majesty's Cardiac Center, Faculty of Medicine, Siriraj Hospital, Mahidol University.

7. Dr.Rungroj Krittayaphong

    Her Majesty's Cardiac Center, Faculty of Medicine, Siriraj hospital, Mahidol University.

8. Mrs.Suchada Raungratanaamporn

    Division of Nursing, Faculty of Medicine, Siriraj Hospital, Mahidol University.

The Consent Letter Form

My name is Sudanun Sang-gassanee. I am a master's degree student at the Faculty of Nursing, Mahidol University. My research is entitled "The study of health behaviors and plasma lipid levels in the Muslim patients with coronary heart disease in fasting period during the month of Ramadan in Narathiwat Province." I would like you to provide the answers by agreeing to be interviewed. The answers will not affect the treatment you are receiving in any way. Your data is very important for the success of this study. It is expected that the resources from this study will help you, other patients, and the society at large in the future.

If you have any question regarding this study, please discuss it with me. The length of this interview is about 30 minutes and you will be interviewed twice-- before and after the month of Ramadan. Your decision to participate in the study is absolutely voluntary and you may withdraw from this study at any time. Your refusal will in no way affect the services you receive from the hospital.

Thank you for considering my request.

Sincerely,
Sudanun Sanggasanee

For the participant

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

....
(Signature of the patient)

The instrument form to collect data

Date......................
Code....................
HN. ....

This form use for the Muslim with CHD patients who is fasting during the month of Ramadan and receive the services at heart clinic in Sungai- Golok hospital. There are 5 part as follow:

1. The personal data record
2. The recording of personal health database
3. The interview protocol of the food and the frequency of the having food in one week ago
4. The interview form of daily life behavior of the CHD Islamic patients before and during the month of Ramadan
5. The interview form of the symptoms of the CHD Muslim patients a mouth

PART 1 The personal data record

1.Sex.   ( ) Male   ( ) Female

2.Age .... years old

3.Marital Status   ( ) Singer   ( ) Married   ( ) Widowed   ( ) Divorced

4.Familly Characteristic   ( ) Single family   ( ) Extended family

5.Family status   ( ) Leader   ( ) Member

6. Education level

    ( ) Primary school   ( ) secondary school   ( ) Certificate, Dipomate

    ( ) Bachelor Degree   ( ) More than Bachelor Degree ( ) other............

7.The Income....................... Baht per month

    The Adequeate of income   ( ) Adequiate   ( ) Inadequeate

8.Occupation

    ( ) Agriculture   ( ) Government officer   ( ) Merchant

    ( ) Labor   ( ) other………………

    ( ) Not work   ( ) House work   ( ) The religious fraternity

Characteristeristic

    ( ) Sedentary work   ( ) non sedentary work

9.Type of the payment for treatment

    ( )Private insurance   ( ) Government funds ( )Government Health assurance

    ( )Social support   ( ) Older card   ( ) Other……………

10.Who has CHD history in your family

    ( ) Father   ( ) Mother

    ( ) Old brother/sister   ( ) Young brother/ sister   ( ) Other……………

11. Duration of CHD diagnosis

    ( ) Less than 1 year   ( ) 1-5 years   ( ) 5-10 years   ( ) More than 10 years

12.Type of the treatment that you choose to treat the CHD.

    ( )In clinic / hospital   ( ) Herbal and in clinic / hospital

    ( )Black Magic and in clinic / hospital( ) other…………………….

13.Have you any disease or any symptoms like

    ( ) Diabetes   ( ) Hypertension   ( ) Arthitis

    ( ) Asthma   ( )Manopluse   ( ) Other…………… ( ) No disease

14.Now, How are your health status?

1	2	3	4	5	6	7	8	9	10

Poor   Good

PART 2 The recording of personal health database

1.Height ....cm. (date...............)

2.Body weight

        Before the fasting period .... Kg   (date...............)

        After the fasting period .... Kg   (date...............)

3.BMI   Before the fasting period .... Kg/m^2 (date...............)

        After the fasting period .... Kg/m^2 (date...............)

4.Pulse rate   Before the fasting period .... beats / min (date...............)

        After the fasting period .... beats / min (date...............)

5.The blood pressure

        Before the fasting period .... mmHg   (date...............)

        After the fasting period .... mmHg   (date...............)

6.The plasma lipid levels

    6.1 Total Cholesterol

        Before the fasting period .... mg/dl   (date...............)

        After the fasting period .... mg/dl   (date...............)

    6.2 Triglyceride

        Before the fasting period .... mg/dl   (date...............)

        After the fasting period .... mg/dl   (date...............)

    6.3 HDL-C

        Before the fasting period ....mg/dl   (date...............)

        After the fasting period ....mg/dl   (date...............)

    6.4 LDL-C

        Before the fasting period .... mg/dl   (date...............)

        After the fasting period .... mg/dl   (date...............)

PART 3 The interview form of the food and the frequency of the having food in one
week ago

( ) Before the fasting   ( ) After the fasting

The kind and quality of food that eating	The Frequency of the eating in 1 week				The Quality of the kind of food that is eating in a meal
	Do not eating	1-7 meals	7-13 meals	More than 13 meals	
1. Fry rice, fry noodle, Kow-mok-kai, Kow- mok-kai					
2. Peeji-aryea, Peeji- eekea (Fish or chicken with fry and cook with curry and coconut milk)					
3. Soup					
………………					
……………					
………………					
19.Tong-yib, Tong yoat					
20. Softdrinks					
Other……………………					
…………………………….					

Note: The quantity of the kind of food is teaspoon, tablespoon, bowl, and plate.

PART 4 The interview form of daily life behavior of the CHD Islamic patients before
and during the Ramadan month

Before the fasting period

1. How many meals do you have in one day? ....

2. What do you usually do in your everyday life...

3. Do you usually exercise?...

....

....

....

During the fasting period

6. Do you fast allthough the month of Ramadan?...

   How many meal in one day that you skip during fasting?...

....

....

....

11. What activity that you have especially during the month of Ramadan?

....

12.How are the effects for your health during the fasting in the month of Ramadan ?

1	2	3	4	5	6	7	8	9	10

    Less   More

PART 5 The interview form of the symptoms of the CHD Muslim patients a mouth

( ) Before the fasting   ( ) After the fasting

Symptoms	Experience		The frequancy
	Have	Not have	of the symptoms
1.Chest pain or angina pain 2.To lost the angina pain after you rest 3. To be rided angina pain by 1 tablet of sublingual drug ………………………… ………………………… ………………………… 10.The other symptoms …………………… ……………………			

The nutrient composition and the kind of the local foods in Narathiwat

Table 12 Nutrient composition per 100 grams elible portion

Kind of food	Energy	Protein	Fat	Carbohydrate	Crude fiber and dietary fiber
1. Cereal andgrain products					
-Rice, unpolished	352	7.8	3.4	72.6	3.4
-Rice, polished	354	6.2	1.1	79.8	0.6
-Glutinous rice, steanied	230	4.1	0.6	52.2	0.1
-Rice noodle, dried	347	6.6	0.2	79.7	0.4
-Rice noodle	135	2.5	0.8	49.4	0.1
-Rice noodle	217	4.4	0.6	29.4	0.2
2.Marine product, meat, milk					
-Giant tiger prawn, body	92	20.1	1.3	0	0
-shimp, dried	225	46.4	2.9	10.9	1.9
-Fresh-water catfish	114	23.0	2.4	0	0.1
-Short-body mackerl	140	20.0	6.7	0	0
-Striped catfish	256	15.5	21.5	0	0.1
-Splendid squid	67	15.2	0.7	0	0.2
-Serrated mud crub	116	17.2	4.5	1.7	0.1
-Blue swimming creb	78	16.2	1.5	0	0.1
-Cockel, ark shell	80	12.9	1.3	4.1	0.2
-Green mussel	53	8.1	0.9	3.0	0.1
-Hen egg, whole	160	12.3	11.7	1.4	0
-Duck egg, whole	186	12.3	14.3	2.1	0
-milk	447	13.2	20.4	60.2	0
3.vegetable and friuts					
-Cabbage	11	1.6	0.1	1.0	1.7
-Corn, maize,young	91.8	2.3	0.3	3.2	2.7
-Ginger, mature rhizome	52	0.4	0.6	4.4	0.8
- Ginger, young rhizome	12	0.5	0.3	1.9	0.6
-Cucumber	12	0.8	0.1	2.0	1.1
-Irygourd, leaves and tip	35	3.3	0.4	4.5	1.0
-Mung bean sprout	36	2.8	0.1	5.9	0.7
-String beans or yard long bean	29	2.8	0.3	3.9	3.3
-Angled gourd	17	0.7	0.2	3.0	0.3
-Chinese cabbag	8	1.5	0.2	0	2.2
-Chinese white cabbage	9	1.5	0.1	0.6	0.5
-Ork fern	19	1.7	0.4	2.2	1.4
-Chinese kile	24	2.7	0.5	2.2	1.6

Table 12 (cont.)

Kind of food	Energy	Protein	Fat	Carbohydrate	Crude fiber and dietary fiber
-Fennel, common leaves	32	2.4	0.4	4.6	1.7
-Swamp cabbage(white)	22	2.6	0.2	2.5	1.1
-Swamp cabbage(red)	15	1.5	0.2	1.9	0.8
-Chili pepper	44	0.4	1.2	7.8	4.5
-pepper, young friute	94	4.4	2.6	13.2	6.1
-Waxgourd, ashgourd	11	0.4	0	2.4	0.5
-pumpkin, with skin	43	1.9	0.2	8.5	1.7
-tomato	22	1.1	0.3	3.6	1.2
-Bilercucumber,Chinese	28	1.0	0.2	5.6	0.7
-Parbia, speciassa	130	8.0	4.0	15.5	0.5
-Meem tree	76	5.4	0.5	12.5	2.2
-Stram mushroom	43	3.0	1.8	3.8	1.4
-Jew's ear mushroom	43	1.4	0.1	9.1	1.8
-Banana	140	1.5	0.2	32.9	2.3
-Banana	139	1.1	0.2	33.1	2.6
-Rambutan	63	0.9	0.1	14.5	1.1
-water melon	6	0.3	0	1.3	0.1
-Durian	139	2.5	4.6	22.3	2.4
-Durian	156	2.1	3.3	29.6	1.4
-Papaya	51	0.8	0.3	11.3	0.5
-suger palm	47	0.5	1.0	9.0	0.5
-orange	37	0.6	0.4	7.8	1.8
4.Condiment					
-Shrimp or fish paste	137	23.8	2.8	4.2	1.7
-Garlic, dried bulb	140	5.6	0.1	29.1	0.9
-Lemon grass	126	1.2	2.1	25.5	4.2
-Coriander, seed	166	3.6	0.6	26.6	29.7
-capricum annum	267	14.4	11.8	25.7	24.3
-Critrus hystrix	138	6.8	3.1	20.8	8.2
-Allium ascalonicum. Linn.	61	2.7	0.2	12.0	0.6
-Allium cepa, Linn.	26	1.4	0.1	5.0	1.8
-Chlli paste	95	4.2	24.3	7.8	3.7
-Curry power	274	7.1	7.0	48.7	6.3

From :Neutrition Diviation, Departmant of Health, Ministry of Public Health (2535:1-73)

The compendium of physical activity

Table13 The compendium of physical activity

Activity	Cal/Kg/hr	METs
Sitting	0.4	2.0
Standing, standing work	0.6	2.0-5.0
Driving car	0.9	2.5
To iron the clothes, Washing the plates	1.0	2.5
Washing the floor	1.2	3.5
Washing the clothes	1.3	5.0
Sweeping the floor	1.4	4.0-5.5
Cooking	-	2.5
Playing goft	1.5	2.0-5.5
Slowly walk (3 miles per hour)	2.0	2.4
Ride the bicycle	2.5	4.0
Quiecly walk (4 mile per hour)	3.4	4.0
Playing table tennis	4.4	4.0
Playing tennis	5.0	6.0-8.0
Aerobic dance	7.7	4.5-6.0
Running	7.7	3.0-18.0
Quickly ride the bicycle	7.6	6.0-16.0
Swimming (2 miles per hour)	7.9	6.0-10.0
Very quickly walk (5.3miles per hour)	8.3	6.0
Child care	-	3.0-3.5
Farming	-	2.5-8.0
Up stairs	-	8.0
Carring the thing up stairs	-	3.5-10.0
Down stairs	-	3.0

From: Jitrpituk,S. (2532: 125-126)

   Ainsworth (1993) cited by Heyward (1998:291-302)

The lipids measurement

The measurement of plasma lipids and lipoprotiens is essential for the diagnosis of lipid abnormalities and for the identification of the risk factor for coronary heart disease. The most common lipid analysis includes measurement of total cholesterol (TC), triglyceride (TG), and HDL cholesterol. LDL cholesterol calculation use the following equation: LDL-C = TC- (TG/)-HDL-C. This indirect assesment can be used if TG is less than 400 mg/dL. If it is above 400 mg-dL , it must be directly measured using the more complex and costly ultracentrifugation procedure.

The NCEP recommends the following laboratory standard of practice measure and to prepare cases for plasma lipids measurement:

1. Blood collection procedure should include a 12 hour fast (except for water and usual medication) prior to sampling if lipid measurement other than TC are to be performed.

2. Stable lifestyle, including health, diet, medication, and acivity level, for at least 2 weeks prior to measurement.

3. The patient should sit quietly for 5 minutes prior to vein puncture.

4. Obtained sample within 1 minute of tourniquet application.

5. Cholesterol measures should be made no sooner than 8 weeks after a myocardial infarction, surgical procedure, trauma, or an acute bacterial or viral infection.

6. Standardized procedures for processing and transporting samples should be followed.

The tables showing other values presented in Chapter V

Table 14 The score of eating behavior before and during the month of Ramadan between male and female

group	Before the fasting in Ramadan		During the fasting in the Ramadan	
	Mean	S.D	Mean	S.D.
Male	61.58	5.9	59.60	4.5
Female	62.26	4.0	59.78	4.5
Elderly	60.86	4.7	58.70	3.7

Table 15 The ratio of TC / HDL-C and LAL-C/HDL-C

Ratio	Before the fasting in Ramadan	During the fasting in the Ramadan
TC / HDL-C (3.5)	4.40	4.28
LDL-C / HDL-C (2.5)	2.80	2.77

Table 16 Mean and t-value of HDL-C in exercise and non exercise subjects, and the subjects that ate 2 meals and more than 2 meals in a day

Group	HDL-C					
	Before the month of Ramadan		After the month of Ramadan			
	Mean	S.D.	Mean	S.D.	t	p
Exercise	51.82	7.6	58.38	9.6	2.37	.028[*]
Non exercise	58.03	16.96	60.95	14.81	1.12	.268
2 Meals	54.77	13.68	59.22	11.97	2.78	.007[**]
More than 2 meal	63.68	19.85	62.51	5.91	0.19	.860

[*] $p < .05$, [**] $p < .01$

Table 17 Mean and S.D. of symptoms before and during the month of Ramadan

group	Before the fasting in Ramadan		During the fasting in the Ramadan	
	Mean	S.D	Mean	S.D.
occupation group	6.33	2.4	7.2	2.9
non occupation group	6.00	1.9	7.0	2.5

BIOGRAPHY

NAME	Miss Sudanun Sang-gassanee
DATE OF BIRTH	July 1969
PLACE OF BIRTH	Narathiwat, Thailand
INSTTUTION ATTENDED	College of Nursing Songkhla, (1990-1993)
	Diploma of Nursing science
	Sukhothai Thummathirat Open University, (1994-1996)
	Bachelor of Communication Art
	Sukhothai Thummathirat Open University, (1997-1998)
	Bachelor of Public Health Science
	Mahidol University, (1998-1999)
	Master of Nursing Science (Adult Nursing)
POSITION&OFFICE	1994 – Present : Staff Nurse
	Intensive Care Unit, Division of Nursing
	Sungai Golok Hospital: Narathiwat, Thailand.