THE STUDY OF HEALTH PERCEPTION AND ANXIETY IN PATIENTS WITH CORONARY ARTERY DISEASE UNDERGOING CARDIAC INVESTIGATIONS

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF NURSING SCIENCE
(ADULT NURSING)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
1999

ISBN 974-662-651-5

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THE STUDY OF HEALTH PERCEPTION AND ANXIETY IN PATIENTS WITH CORONARY ARTERY DISEASE UNDERGOING CARDIAC INVESTIGATIONS

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Nursing Science (Adult Nursing)
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Acknowledgements

I would like to express my sincere gratitude and deep appreciation to Associate Professor Sompan Hinjiranan my Major-Advisor for her guidance, invaluable advice, supervision and encouragement throughout. She was never lacking in kindness and support.

I would like to thank Associate Professor Wannee Satayawiwat for her helpful guidance and support with respect to the statistical analysis of the data. I also would like to thank Assistant Professor Penchun Sareewiwatthana for her great assistance in programming, guidance and solving problems.

I would like to thank Associate Professor Dr. Kiertijai Bhuripanyo for his constructive comment, supervision and encouragement. He was always nice and friendly.

I wish to thank the staff of the Division of Cardiology Department of Medicine, Division of Nuclear Medicine Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine Siriraj Hospital, Mahidol University for their co-operation and generous assisstance. In particular I would like to thank the patients were participated this study.

Finally, I am particularly thankful to my parents, my husband and my sons for their great support and understanding throughout my study.

Suchada Raungratanaamporn

4037065 NSAN/M : MAJOR : ADULT NURSING; M.N.S.(ADULT NURSING)
KEY WORDS : HEALTH PERCEPTION / ANXIETY / CORONARY ARTERY DISEASE / CARDIAC INVESTIGATION

SUCHADA RAUNGRATANAAMPORN : THE STUDY OF HEALTH PERCEPTION AND ANXIETY IN PATIENTS WITH CORONARY ARTERY DISEASE UNDERGOING CARDIAC INVESTIGATIONS. THESIS ADVISORS : SOMPAN HINJIRANAN, M.S., WANNEE SATAYAWIWAT, M.Ed., PENCHUN SAREEWIWATTHANA, M.Sc., 83p. ISBN 974-662-651-5

The purpose of this descriptive research was to determine the relationship between health perception and anxiety in 150 patients with coronary artery disease undergoing cardiac investigations, 75 subjects in each for noninvasive and invasive investigations at the Division of Cardiology, Department of Medicine, Division of Nuclear Medicine, Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital, Mahidol University.

The instruments for data collection were interviewing forms, composed of three parts : demographic data, health perception and anxiety questionnaire. Content validity was assessed by 5 experts. The reliability, analyzed by Cronbach's alpha coefficient, of health perception, state and trait anxiety before investigations and state anxiety after investigation were .72, .88, .82 and .87, respectively. The derived data were analyzed and reported as frequency, percentage, mean, standard deviation, Pearson's correlation coefficient and compared by t-test.

The results of this study showed that before the investigations the patients had a fair level of health perception. The state and trait anxiety levels were moderate and mild, respectively. The state anxiety before investigation was correlated to trait anxiety ($p<.01$). Both state and trait anxiety were correlated to health perception ($p<.01$) in both non invasive and invasive patients ($p<.01$). The state anxiety before investigation between noninvasive and invasive investigations was not different. After investigation, the state anxiety was lower than before investigation ($p<.01$). However, 32% of the patients still had a moderate level of state anxiety. Nurses should promote and support the patients to improve their health perceptions and pay attention to patients both before and after noninvasive and invasive investigations in order to decrease their anxiety level.

4037065 NSAN/M : สาขาวิชา : การพยาบาลผู้ใหญ่; พย.ม. (การพยาบาลผู้ใหญ่)

สุชาดา เรืองรัตนอัมพร : ศึกษาการรับรู้ภาวะสุขภาพและความวิตกกังวลในผู้ป่วยโรคหลอดเลือดหัวใจที่มารับการตรวจวินิจฉัยการทำงานของหัวใจ (THE STUDY OF HEALTH PERCEPTION AND ANXIETY IN PATIENTS WITH CORONARY ARTERY DISEASE UNDERGOING CARDIAC INVESTIGATIONS). คณะกรรมการควบคุมวิทยานิพนธ์ : สมพันธ์ หิญชีระนันทน์, M.S., วรรณี สัตยวิวัฒน์, M.Ed., เพ็ญจันทร์ เสรีวิวัฒนา, M.Sc. 83หน้า. ISBN 974-662-651-5

การวิจัยครั้งนี้มุ่งศึกษาความสัมพันธ์ระหว่างการรับรู้ภาวะสุขภาพและความวิตกกังวลในผู้ป่วยโรคหลอดเลือดหัวใจที่มารับการตรวจวินิจฉัยการทำงานของหัวใจจำนวน 150 ราย เป็นผู้ป่วยที่มารับการตรวจแบบนอนอินเวซีฟและอินเวซีฟกลุ่มละ 75 รายที่สาขาหทัยวิทยา ภาควิชาอายุรศาสตร์ สาขาวิชาเวชศาสตร์นิวเคลียร์ ภาควิชารังสีวิทยาและสำนักงานศูนย์โรคหัวใจสมเด็จพระบรมราชินีนาถ คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล

ในการศึกษาใช้แบบสัมภาษณ์ประกอบด้วย แบบบันทึกข้อมูลส่วนบุคคล แบบสัมภาษณ์การรับรู้ภาวะสุขภาพและวัดความวิตกกังวล ความตรงตามเนื้อหาประเมินโดยผู้เชี่ยวชาญ 5 ท่าน ความเชื่อมั่นของแบบสัมภาษณ์การรับรู้ภาวะสุขภาพ ความวิตกกังวลขณะเผชิญและแบบแฝงก่อนตรวจและความวิตกกังวลขณะเผชิญหลังตรวจวิเคราะห์โดยสัมประสิทธิ์สหสัมพันธ์แบบแอลฟาได้ .72, .88, .82 และ 87 ตามลำดับ วิเคราะห์ข้อมูลโดยหาค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน สัมประสิทธิ์สหสัมพันธ์แบบเพียร์สันและเปรียบเทียบทางสถิติแบบ ที-เทส (t-test)

การวิจัยพบว่าก่อนตรวจผู้ป่วยมีการรับรู้ภาวะสุขภาพระดับพอใช้ มีความวิตกกังวลขณะเผชิญและแบบแฝงระดับปานกลางและค่อนข้างต่ำตามลำดับ ความวิตกกังวลขณะเผชิญก่อนตรวจสัมพันธ์กับความวิตกกังวลแบบแฝง($p<.01$) ความวิตกกังวลขณะเผชิญและแบบแฝงสัมพันธ์กับการรับรู้ภาวะสุขภาพ($p<.01$)ทั้งการตรวจแบบนอนอินเวซีฟและอินเวซีฟ ความวิตกกังวลขณะเผชิญก่อนตรวจทั้งสองแบบไม่แตกต่างกัน ($p > .05$) หลังตรวจความวิตกกังวลขณะเผชิญลดลงกว่าก่อนตรวจ($p<.01$) อย่างไรก็ตามผู้ป่วยร้อยละ 32 ยังมีความวิตกกังวลอยู่ในระดับปานกลาง พยาบาลควรส่งเสริมและสนับสนุนผู้ป่วยให้มีการรับรู้ภาวะสุขภาพให้ดียิ่งขึ้นและให้ความสนใจผู้ป่วยทั้งก่อนและหลังตรวจทั้งแบบนอนอินเวซีฟและอินเวซีฟเพื่อช่วยลดความวิตกกังวล

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CHAPTER I

Introduction

Significance of the study

Generally, everyone accepts that the heart is the most important organ of human life. It is the center of life and predicts the efficacy of a productive life. When abnormal heart functions occur, many symptoms of heart disease can produce sensitive feelings, frustration and uncertainty. Among the various heart diseases, coronary artery disease is the most harmful and life threatening, it causes anxiety and brings fear to patients, because it can cause sudden death at anytime.

The prevalence of heart disease in Thailand has a trend to increase, especially coronary artery disease (CAD). Nowadays it is the leading cause of death in Thais. The prevalence increased from 4.5% in 1933-1948 to 14.9% in 1968(Sinthavanon,K., & Kachacheewa,U., 1993:11-12), and increased to 30% in 1987 (Chaithiraphan,S., 1991:25). Recently, it had reported that coronary artery disease was the most common heart disease in adult patients who underwent echocardiography (Raungratanaamporn,S., et al. 1995:26).

Coronary artery disease is the most common cause of death in western countries, especially in the United States of America. One in ten American women between the age of 45 and 65 have some form of coronary artery disease. The incidence increases to one in five in women over 65 (Evanoski, 1997:489).

Lukkarinen & Hentinen (1997:73) studied the quality of life of 280 patients suffering from coronary artery disease. The patients had been treated with medication or cardiac intervention (percutaneous transluminal coronary arterioplasty, PTCA), or surgery (coronary artery bypass graft, CABG). The subjective health problems in six dimensions, (i.e. physical morbidity, pain, sleep, energy, emotional reactions, and social isolation) before the invasive procedures were significantly poor.

Jonsdottir & Baldursdottir (1998:68) who studied the symptoms of these patients waiting for CABG, indicated that the prominent symptoms were fatigue, shortness of breath, chest pain, anxiety and depression. In addition, 86.6% of them experienced stress and 28.4% of them reported serious level of stress.

Because of the rapid development of knowledge and technology, the symptoms of patients who have coronary artery disease can be relieved by medication, cardiac intervention, surgery, or a combination of both. The results of treatment are satisfactory, but the procedures for cardiac investigation to search for the severity of disease are complicated in all steps of management, including instruments/machines, method/process of procedures, result/outcome, cost/benefit and forward treatment.

There are several cardiac investigations available. Each procedure has a different sensitivity/specificity and limitations and selecting of the investigation depends on the clinical indication of each patient.

Cardiac investigations for coronary artery disease can be divided into noninvasive and invasive techniques. Noninvasive techniques, such as an exercise stress test (EST) and nuclear cardiology are commonly used because of their safety. Coronary angiography (CAG) is an invasive technique, and is the gold standard for

the diagnosis of coronary artery disease as it shows detailed anatomy of the coronary arteries. Preparation for this procedure is as significant as surgery.

Although EST, nuclear cardiology or radioactive tracer technique, and CAG are safe, patients who required specialized cardiac investigation feel anxious. There were some studies of patients who had undergone cardiac catheterization. The results of these studies had a moderate level of anxiety before tests and a mild level after tests (Damrongvadha, T., & Tantitham, C. 1996:52). The next study reported that state anxiety of the subjects pre discharge from hospital had a mild level (Degchaiyun,Y., & Tansupasiri,P. 1998:21). In the patients who had undergone their first cardiac catheterization reported that their anxiety were increased because of the fear of the unknown as well as fear of the possible outcomes (Becherman, Grossman & Marques, 1995:213), and other study found that more than 80% reported fear and one-third had more fear after tests (Heikkila, et al.,1998:54).

For the etymologist, fear means sudden danger. The danger is concrete, real, knowable. The fear is appropriate and is useful to avoid harm (Goodwin, 1986:192). Fear is an emotional and perception reaction and relates to a low estimate of one's power to resist the threat. Anxiety and fear are very close in meaning. Anxiety gives a tight feeling in the chest and refers to a fear of the uncertain origin and is disproportionate to the danger. Anxiety is a state of tension and expectation of disaster. Anxiety-ridden individuals are continuously unhappy, worrisome, and pessimistic, irrespective of existing or nonexisting dangers. Anxiety-ridden persons feel weak, inferior, helpless, and do not believe that anyone can save them. Anxiety

can temporarily affect one's intellectual function, especially the memory and the ability to express oneself.

Anxiety can be caused by physical ailments and can cause psychosomatic symptoms. The characteristic of anxiety is individual different. In the patients who are suspected to have coronary artery disease usually have frustration leading to anxiety. From the stress theory, appraisal and coping of Lazarus and Folkman (1984) stated the illness is a situation difficult to avoid. The perception of patients who have had psychologically traumatic events can be defined as an objective experience of a person concerning their own life. Each patient has different basic conditioning factors which make their health perception different too.

Health perception, in general, includes well being and sickness or illness, alternately or continuously and different in each person's representation. Health perception is based on an individual's knowledge and experiences.

The health perception is not always easy to change. The study of health perception in myocardial infarction patients showed that health perception between constructive education and routinely advised by a nurse immediate measurement and at two weeks after discharge from hospital were not statistically different (Hankunakul, W. 1997).

From the previous study, the coronary artery disease patients had a good health perception level. The demographic data of these subjects were similar. Most of them were male, aged more than 56 years and had a primary school education (Pringpurd, S. 1995, Vorana, P. 1998, & Yoswattana, R. 1992).

Health perception communicates by feeling presentation, opinion or cognition to health perception understanding. There are many studies of the relationship between health perception and self-care behavior or health perception and adaption in heart disease patients (Bhavilai, C. 1992, Chuenjairuang, C. 1993, Hankunakul, W. 1997, Pringpurd, S. 1995, Puasiri, S. 1991, Voranan, P. 1998, & Yoswattana, R. 1992). However, to our knowledges, the study of health perception in the patients who had undergone cardiac investigation could not be found in Thailand.

Nowadays cardiac investigations both noninvasive and invasive tests are usually performed with worldwide acceptance. They are important diagnostic tools that have become an integral part of the work up for patients with suspected or established coronary artery disease. The patients in this groups always have frustration and uncertainty which lead to anxiety, in the first experience, especially.

Coronary artery disease itself can provoke anxiety because of symptoms and limitations on the performance of daily activities. The anxiety of the patient with coronary artery disease is a subjective experience, duration and severity of anxiety depends on their perception and interpretation. The anxiety is divided into state and trait anxiety that is related together. The state anxiety of the patients who undergo cardiac investigations have a fear of the unknown, results and possibility of needing cardiac surgery. For the trait anxiety, it is the individual difference that may influence the thinking process.

Because of trait anxiety is a personal character which is an individual difference. The state anxiety of the patients is different too. While the patients are waiting for the cardiac investigations, they are exposed to the suffering of other patients affected by

the same illness. In the case of suspicious coronary artery disease, they are doubtful and uncertain about in their health status that is assessed by their perception.

The health perception of the patient who is undergoing cardiac investigation is based on individual knowledge, both direct and indirect experiences about coronary artery disease and the process of the investigations that are self-assessed. The prior and current health perceptions lead to health perception in the future. The perception of health worries or health concerns and the resistance or susceptibility lead to understand sickness orientation.

The purpose of this study is to determine the health perceptions and anxiety in the patients with coronary artery disease, who were scheduled to have cardiac investigation, as the framework in figure 1.

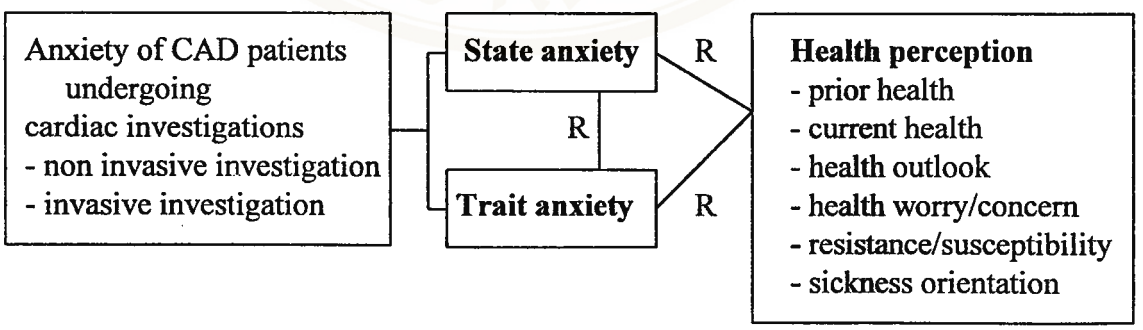

Figure 1. Conceptual framework

R = relationship

Objectives

1. To determine the level of health perception, state anxiety and trait anxiety in patients with coronary artery disease, before their non invasive and invasive investigations.

2. To determine the state anxiety level in patients with coronary artery disease, after their non invasive and invasive investigations.

3. To study the relationship between health perception and state anxiety in patients with coronary artery disease, before their non invasive and invasive investigations.

4. To study the relationship between health perception and trait anxiety in patients with coronary artery disease, before their non invasive and invasive investigations.

5. To study the relationship between the state anxiety and trait anxiety in the patients with coronary artery disease, before their non invasive and invasive investigations.

6. To compare the state anxiety in patients with coronary artery disease between before and after their non invasive and invasive investigations.

7. To compare the state anxiety before the investigation in patients with coronary artery disease between non invasive and invasive investigations.

Hypotheses

1. The health perception of patients before their non invasive and their invasive investigations are correlated to state anxiety.

2. The health perception of patients before their non invasive and their invasive investigations are correlated to trait anxiety.

3. The state anxiety of patients before their non invasive and their invasive investigations are correlated to trait anxiety.

4. The state anxiety of patients after their investigation is lower than before the investigation both non invasive and invasive investigations.

5. The state anxiety of patients underwent non invasive and invasive investigations before their investigations are not different.

Scope of the study

This study emphasizes the health perceptions and anxiety in patients with suspected or established coronary artery disease, who are scheduled to undergo cardiac investigations including EST, nuclear cardiology, and CAG at the Division of Cardiology, Department of Medicine; Division of Nuclear Medicine, Department of Radiology; and Her Majesty's Cardiac Center, Faculty of Medicine, Siriraj Hospital, Mahidol University.

Usefulness

1. As baseline of information for nursing personel to advise patients with coronary artery disease.

2. As a guideline for specific nursing development for patients with coronary artery disease.

3. As a guideline to develop specific nursing roles to take care of patients with coronary artery disease.

4. Nurses will be able to understand the problems of patients with coronary artery disease undergoing cardiac investigations in order to find suitable methods for solving these problems.

Definition of variables

Health perception means the perception of patients with coronary artery disease about self-health and self-illness. The health perception includes six dimensions: prior health, current health, health outlook, health worry/concern, resistance/susceptibility, and sickness orientation.

State anxiety means an emotional reaction of the patients with coronary artery disease undergoing cardiac investigations, non invasive and invasive investigations. The state anxiety consists of feeling of tension, apprehension, nervousness, unhappiness, pessimism, and worry. This emotional response will be assessed before and after investigations.

Trait anxiety means the general daily life feels of patients with coronary artery disease which is a personal-trait and an individual's stability difference . This feeling will be assessed before the investigation.

CHAPTER II

Literature review

The rationale for the study of health perception and anxiety in the patients with coronary artery disease undergoing cardiac investigation is provided by reviewing the theoretical and empirical literature on the following topics:

1. Cardiac investigation for coronary artery disease
2. Health perception and anxiety of patients with coronary artery disease
   - 2.1 concepts of health perception
   - 2.2 health perception of patients with coronary artery disease
   - 2.3 concepts of anxiety
   - 2.4 anxiety of patients with coronary artery disease
   - 2.5 effects of anxiety on perception

1. Cardiac investigation for coronary artery disease

Coronary artery disease is a pathological condition that effects the coronary arteries; particularly those which decrease the flow of oxygen and other nutrients to the myocardium. They may be temporary or permanent. The outstanding symptom of coronary artery disease is chest pain which may be associated with coronary thrombosis and myocardial infarction, and may result in sudden cardiac death.

Cardiac investigation, both noninvasive and invasive techniques are performed to assess cardiac functions emphasis on myocardial function. Physicians always order tests e.g. electrocardiography (ECG), echocardiography, exercise stress test (EST), nuclear cardiology, and cardiac catheterization for patients who are suspected of having coronary artery disease.

Electrocardiography (ECG) and echocardiography are the most common procedures for cardiac investigation because nowadays they are routine investigations, easy to do, non dangerous and can immediately provide the results.

Exercise stress test (EST) is performed to patients who are suspected to have coronary artery disease. The patient exercises on a treadmill with variable speed and slope in order to achieve the target heart rate of 85% of predicted maximal heart rate (calculated by 220 minus patient's age). The test is interpreted the ST segment change on the surface 12 lead ECG that is obtained from each stage of exercise test, cardiac arrhythmia (especially ventricular tachycardia), symptoms and signs of ischemia or heart failure. The level of exercise is calculated by the double product (maximal systolic blood pressure multiply by maximal heart rate). The preparation for the test is very important for reliability and acceptibility of the result.

Nuclear cardiology or radioactive tracer techniques is being used with increasing frequency in cardiovascular diagnosis. Small amounts of radioactive material are injected intravenously during peak exercise, and a variety of tracers and recording techniques are used to record radioactivity in the heart.

Myocardial perfusion scan or thallium imaging involves injection of a radioactive tracer (thallium 201), which is a substituter for ionic potassium. Thallium

201 accumulates in the myocardium in the areas where blood flow are adequate and a viable myocardial cell. When an area is inadequately perfused, the accumulation of thallium 201 is decreased. These areas are cold spots on the scan. Myocardial perfusion scaning enables indirect evidence of coronary artery narrowing or obstruction and detection and location of myocardial infarctions.

Perfusion scaning can also be combined with exercise testing or exercise electrocardiography to assess changes in the coronary blood flow during exercise (thallium stress testing). Injection of thallium during performance of aerobic exercises and scaning after aerobic exercises enable us to evaluate the areas that are adequately perfused at rest and ischemia under stress. Ischemic areas accumulate the tracer normally under restful conditions but lack uptake during exercise. The persistance of flow intake during rest and exercise signals myocardial infarction (Beare & Myers, 1994:782-783).

Nurses explain the procedures to the patients and provides reassurance that the amount of radioactive material is minimal and will be excreated from the body in 6 to 24 hours and will not effect them at all.

Coronary angiography (CAG) is the definitive test for the diagnosis of coronary artery disease. It can obtain some information about cardiac disorders and use to identify the lesion and severity of obstruction in the coronary arteries. Selective coronary angiography is often performed in conjuction with cardiac catheterization, involving the placement of catheters into the femoral artery that are advanced into the heart. Pressures are measured and dye/contrast medium is injected

into the coronary arteries, which are visualized under fluoroscopy to determine the extent of any present narrowings.

The procedure are performed after the patient consent form has been signed and read explaining. The risk/complications, minor and major complications of the procedure including; looping, kinking, or breaking of the catheter; dysrhythmias; allergic reaction to the contrast medium; arterial thrombosis; myocardial infarction; infection; and haemorrage at the insertion site, are also explained to the patient before performing the procedure.

2. Health perception and anxiety of patients with coronary artery disease

2.1 Concepts of health perception

Meaning of health

Health is the state of an individual who enjoys complete physical, mental, and social well-being, not merely the absence of disease or other abnormal condition (Blackwell's Dictionary of Nursing, 1994:315).

Health is defined as dynamic life experiences of a human being, which implies continuous adjustment to the stressors in the internal and external environments through optimum use of one's resources to achieve maximum potential for daily living (King, 1981:5)

Meaning of perception

Perception means the impression of an object obtained through the sense or the mental product of a sensation; a sensation plus memories of similar sensations and their relationships. Perception process is the process of response to

stimuli, process of selecting, organizing and interpreting sensory stimuli into a meaningful and coherent picture of the world.

Because perception focuses on sensory stimuli, each person has a unique perceptual field that includes public opinion, justice, value, love, hate, compassion, and other variables (Kozier & Erb, 1988:145). So one's perceptions are related to past experiences, concept of self, socioeconomic groups, biological inheritance, and educational background (King, 1981:146).

Perception is the basic of psychological process response to the stimuli that support by self-experience, knowledge and momery (Bunting, 1988:168).

Perception is the interpretation of a stimulus and the conscious appreciation of it; the result of activity of cells in the cortex (Roy, 1991:166).

Perceptions are influenced by current interests, needs, and future goals. Human beings are in a continuous state of active participation in perception. Awareness of past events, values, and needs serve as organizing factors in one's perceptions (King, 1981:23).

Health perception bases on an individual knowledge and experiences includes well-being and sickness or illness. It is different in each person's representation.

In the cycle of good health and sickness/illness, the perception of humans has 3 stages: 1) The transition from health to illness. Begins with symptom development which is accompanied by unpleasant sensations, loss of vigor and stamina, and a decrease in the ability to function. 2) The period of "accepted" illness. Accepting the illness, the person recognizes and acknowledges the illness and the need for assisstance from others, especially from medical and nursing staff.

3) The convalescent or resititution period is particularly true if the illness and treatment require major changes in work and family relations.

2.2 Health perception of patients with coronary artery disease

Measures of general health perceptions differ from other measures of health status in that they do not focus on a specific dimension of health status (i.e., physical, physiological, mental or social). Instead, such measures ask responsibility for an assessment or self-rating of their health in general. It has been defined with respect to time (perceptions of prior, current and future health) and to their other constructs indicative of general health perceptions, including resistance or susceptibility to illness, health worry and concern, and sickness orientation (the extent to which people perceive illness to be a part of their lives).

In this study, the health perception will be used the concepts from the General Health Perception Battery by Brook, et al. (1979) because this concept is used to measure the health for adults in the Health Insurance Study which is funded by the U.S. Department of Health, Education, and Welfare. The concepts consist of six aspects.

1. Prior health perception is an individual health acceptance in the past which is based on individual belife, attitude, cognitive, and both direct and indirect experiences. Health perceptions tend to be bad if they have had bad impressions. The patients who were suspected to have coronary artery disease always feel bad, uncertainty and leads them to anxious. The perceptions are distorted from reality. In the otherhand, if they have good impression and experience about their illness, they

always have good perceptions too and they can suitable cope and manage their anxiety.

2. Current health perception is a continuous health acceptance from the past. Health perceptions from the past experience can be changed if one has new a experience and acceptance for his health. Environments such as medical personales, mass media and health informations are factors that influenced the patients'health perception. Patients with coronary artery disease can change their health perceptions and may disagree with their perceptions in the past.

3. Health outlook perception is a health acceptance in the future and is assessed by both prior health and current health. Perceptions to the illness of the others have some influences to the expectation about self health status with both positive and negative results.

4. Health worry/concern perception of patients with coronary artery disease about role functions and life styles always induces anxiety in a higher level and leads to incorrect perceptions.

5. Resistance/susceptibility perception means an expectation in self health status or physical performance. Patients with coronary artery disease accept that they may get sick easier than other people or their bodies may resist the illness quite well.

6. Sickness orientation perception means patients' understanding their health status including their well-being and illness. It developes from life experiences and illness status acceptions. In this state, patients are going to learn and understand

the processes of their diseases and lead them to prepare, adapt, cope and seek medical help.

The signs and symptoms of coronary artery disease lead to anxiety which has an effect on health perception. The malperceptions and higher anxiety level of patients with coronary artery disease make their clinical signs and symptoms worse, both physical and psychological. They feel harmed, frustrated, angry and their perceptions will be changed or distorted from reality. If they have a mild level of anxiety, they tend to change their attitude and believe and they are motivated to increase their self esteem. They can accept the status of their illness and find suitable methods for solving their problems.

The previous study about health perception in cardiac patients who underwent cardiac investigations cannot be found. There was only the study of health perception of patients undergoing coronary artery bypass grafting. The study found that health perception of the coronary artery disease patients had a good level (Pringpurd, S. 1995). The result of health perception study in the patients with coronary artery disease (Yoswattana, R. 1992) and in the coronary artery patients post percutaneous transluminal coronary angiography (Voranan, P. 1998) had good level too. Hankunakul, W. (1995) studied health perception in myocardial infarction patients that were compared between constructive education and routinely advised by nurses which found that health perception scores are measured immediately after education and two weeks after discharge from hospital were not statistically different ($p>.05$).

2.3 Concepts of anxiety

Anxiety is an endogenous feeling of helplessness and adequacy, not a reaction to any particular danger. Anxiety is one of the three major mental disturbances: the others are depression and stress. Almost all mental disorders are accompanied by anxiety symptoms.

Anxiety is the apprehensive tension or uneasiness that stems from the subjective anticipation of imminent or impending danger, in which the source is largely unknown or unrecognized. It is an alarm reaction and the origins are internal and not readily determined (Graham, 1971:113-122).

Anxiety is emotional response to some stimulus and also accompanies the anticipation of some future threat or danger (Narrow & Buschle, 1987:377).

Anxiety-ridden people expect horrible things to happen and doubt their ability to cope with them. Anxiety is a state of apprehension and worry, often associated with inability to cope with true or imaginary hardships. It is continuously unhappy and pessimistic state irrespective of existing or non-existing dangers, and anxiety-ridden people do not believe that anyone can save them.

To understand the phenomenon of anxiety and the nature of anxiety disorders, one should know that anxiety is an emotional response. It has adaptive significance for humans in order to respond to objective danger. The evocation of anxiety in response to mispercieved or exaggerated danger may lead to maladaptation. Individuals with anxiety disorders are prone to precipitate false alarms that create a relatively constant state of emotional tension and subjective distress. The effects of

anxiety involve an individual's cognitive, physiological, motivational, affective, and behavioral systems (Wolkman & Stricker, 1994:77).

The level of anxiety occurs along a continuum from an absence of anxiety that may be unusual or unhealthy to state of severe anxiety or panic that is unhealthy too. Middle level of anxiety can produce behavior which is directed either toward active efforts to relieve and reduce anxiety, or toward escape and avoidance. The levels of anxiety are divided into mild, moderate, severe anxiety, and panic (Narrow & Buschle, 1987:377). From a psychological point of view, the characteristics of anxiety are state and trait anxiety.

State anxiety means a functional and emotional disorder or a condition of disturbed mood and behavior, characterized by feelings of fear, apprehension, nervousness, inadequacy, tension, and dread; usually associated with a real or imaginated threat to one's security.

State anxiety may vary in intensity and fluctuation over time as a function of the stress that impinge on an individual (Spielberger, et al., 1988:241).

Trait anxiety seems to be an individual difference that may influence behavior in highly and moderately stimulating situations.

This trait is usually defined as directly related to individual differences in responsding to certain types of highly stimulating situations, namely threat situations (Spielberger, et al., 1988:103).

2.4 Anxiety of patients with coronary artery disease

The anxiety has both physiologic and psychologic status of the patients. In coronary artery disease patient, majority of them always feel fatique-weakness, and

general malaise, that limit the physical activity. The source of anxiety always originate from either frustration, conflict, stress, uncertainty, or guilt, or a combination. Although the correlation between the central nervous system anatomy and anxiety has not been fully elucidated but it is wildly accepted that the biochemistry change from anxiety especially epinephrine and norepinephrine can induce cardiovascular activity. Cardiovascular responses include palpitation, changing in heart rate and blood pressure and faintness or actual fainting.

Both anxiety and physical limitations make the patient withdraw from other people, and tempolarily effect one's intellectual function, especially memory and ability to express oneself.

At the time that the patient is waiting for the test, the patient is exposed to suffering of other patients affected by the same illness. In the case of suspicious coronary artery disease, the patients are doubtful and uncertain in their health status. They may be of low self-esteem and have feeling of one's weakness, inferriority, and helplessness. Sometimes they may accept that they are just going to be sick but in the same time they may expect to have better health than other in the future. There are several studies about state anxiety before cardiac investigation.

Damrongvadha, T., & Tantitham, C. (1996) studied state anxiety in heart disease patients before cardiac catheterization. The results of their study indicated that subjects experienced moderate level of state anxiety before test, and after test the state anxiety significantly decreased. Peterson (1991:643) studied in patients who underwent cardiac cathterization, found that they experienced much anxiety during the waiting time on the day of test.

Beckerman, Grossman & Marquez (1995:213) studied in the patients who had undergone their first cardiac catheterization. The subjects reported fear and increased fear of the unknown during the test and especially of the outcomes that might affect their future.

There are studies about anxiety in patients who underwent cardiac investigations found that the patients who underwent the first cardiac catheterization had experience anxiety (Davis, et al., 1994:140). The patients reported fears and one-third of them felt an increase in fear after the test (Heikkila, et al., 1998:54-62). Damrongvadha, T. & Tantitham, C. (1996) studied the state and trait anxiety before and after cardiac catheterization and found that the subjects experienced a moderate level of state anxiety before test and state anxiety was significantly decreased after the test. Similar to the study of Damrongvadha, T. & Tantitham, C. (1996), Degchaiyun, Y., & Tansupasiri, P. (1998) found that the subjects after cardiac catheterization had a state anxiety at the time of discharge lower than admission.

Anxiety effects health by trigger the biological processes which leads to the elevatation of blood pressure and increases of the myocardial workload and worsening pathology (Jearsakul, S., 1996:255-260). The severity of anxiety can be classified and measured by the state and trait anxiety questionnaire.

2.5 Effects of anxiety on perception

According to Lazarus and colleague, anxiety and a cognitive appraisal of the situation are mutually dependent (Lazarus, & Averill, 1972:241-283). Anxiety can decrease short-term memory, reduce responses to the environment, and interfere with a variety of cognitive processes. Indirect consequences of anxiety include

deteriorating problem-solving and learning activities (Phillips, Martin, & Meyers, 1972:410-455). In mild level of anxiety, it is more conducive to concentration, learning, and problem-solving. Mild anxiety actually heightens sensory awareness. The patient always increases speech volume and rate and often changes posture, blocking, or loss of train of thought. Moderate or severe anxiety level makes the patient dulls or narrowing perception and leads to distorts perception. Sensory input is reduced and processing of sensory stimuli occurs in a scattered and disorganized manner. The panic level of anxiety, perception becomes grossly distorted. The patient presents an overall picture of extreme emotional discomfort and behavioral disorganization.

The study of health perception and anxiety in cardiac investigations cannot be found, there was only one study on health perception and anxiety in normal primigravida aldolescent (Meesawat, C. 1996). The result of the study found that there was a significant positive correlation between health perception and self-care at .01 level (r = .1673) and a significant negative correlation between anxiety level and self-care at .001 level (r = -.2278).

The effects of anxiety on perception are as follow (Davies & Janosik, 1991:78) : mild level : sound seem louder; irritability, restless, and energy increase, moderate level : concentration, communication, and perception decrease; tension increase, somatic discomforts (sweating, rapid pulse, etc.) occur, severe level: feelings dread, owe, loathing arise, emotional distort increases; physical discomfort increases, panic level:details and occurrences and distorted by being exaggerated or overlooked.

CHAPTER III

Materials and methods

The study design:

This study is a descriptive research. The objective is to study the health perception and anxiety, and the relationship between health perception and anxiety in patients with coronary artery disease, who are planned for cardiac investigation both non invasive and invasive investigations.

The study setting and sample:

The population of this study consist of patients who are suspected to have coronary artery disease and are planned to perform the cardiac investigations, which include exercise stress test (EST), nuclear cardiology, and coronary angiography (CAG) at Division of Cardiology, Department of Medicine, Division of Nuclear Medicine, Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital, Mahidol University.

The sample was selected by purposive sampling. In each group, the subject has never been tested by each of investigation before. The sample size is 150 patients, and is devided equally into non invasive and invasive investigations. Exercise stress test (EST) and nuclear cardiology are non invasive investigation, coronary angiography (CAG) is invasive investigation. In 1998, the number of patients who underwent the number of patients who underwent the first EST and CAG averaged 40

and 55 cases per month, respectively. It differences from nuclear cardiology that performed only 2 - 3 cases per week or averaged 11 cases per month.

Instruments

1. The demographic questionnaire includes sex, age, marital status, educational level, occupation, characteristic of family, family status, previous experience about the investigation from others, economic resourses, cost-responsibility, duration of illness, underlying disease, smoking history and severity of illness.

2. The health perception questionnaire adapted from the General Health Perception Battery of Brook,R.H., et al (1979) was translated into Thai version by Puasiri,S., (1988). The questionnaire consists of 26 items, the investigator adapted and added for more 4 items specifically for heart disease.

The 30 items include

4 items of prior health : 9, 16, 23, 27*

9 items of current health : 1, 3, 7, 10, 14, 18, 22, 25, 26

4 items of health outlook : 4, 8, 15, 19

5 items of health worry/concern : 5, 11, 17, 20, 29*

4 items of resistance/susceptibility : 2, 6, 12, 24.

4 items of sickness orientation : 13, 21, 28*, 30*

(* : investigator added)

There are 20 positive items and 10 negative items. Positive items are 1, 3, 6, 8, 11-14, 16-21, 23, and 26-30. Negative items are 2, 4, 5, 7, 9, 10, 15, 22, 24, and 25.

The items use the 4 point rating scales. And the scoring system was as followed.

	positive item	negative item
definitely false	1	4
mostly false	2	3
mostly true	3	2
definitely true	4	1

The lowest and the hightest possible raw scores in each item range from 30 to 120 and devided into 3 levels equally by arithmetic means. The interpretation of the score is as follow

91 - 120 : good health perception

61 - 90 : fair health perception

30 - 60 : poor health perception

3. For anxiety questionnaire the investigator adapted from State-Trait Anxiety Inventory (STAI) of Spielberger,C.D., at el (1970:20-21), translated into Thai lanuage and developed by Cachapugdee,N., at el (copy,1983) which the investigator allowed already. The STAI consists of self-report scales that measure two distinct anxiety concepts : state and trait anxiety. State anxiety refers to a state of tension and arousal taking place at a given moment. Trait anxiety indicates the predisposition of an individual to react to stress with an increase in state anxity.

The STAI has two 20-item 4 point rating scales. One scale measures state anxiety specific to some situation and the other measures trait anxiety.

3.1 State Form X-I is the State Anxiety. The 10 items are positive and 10items are negative. Positive items are 1, 2, 5, 8, 10, 11, 15, 16, 19,and 20.

3.2 Trait Form X-II is the Trait Anxiety. The 13 items are negative and 7 items are positive. Positive items are 1, 6, 7, 10, 13, 16, and 19.

The reliability of STAI was tested by repeat-testing in freshy student, Faculty of science Mahidol University academic year 1986-1987. By Pearson Product Moment the correlation coefficient(r) of the State Form X-I (r) was 0.27 (from Manual STAI original (r) was 0.16 - 0.54) and Trait Form X-II (r) was 0.83 (from Manual STAI original (r) was 0.73 - 0.86) (Kriadchaiyaphom,B., 1990).

The reliability of State Form X-I were 0.89 and 0.88, and Trait Form X-II were 0.71 and 0.89 respectively as studied by Kitisup,C., (1994) and Kriadchaiyaphom,B., (1990).

The items use the 4 point rating scales. And the scoring system was as followed.

	positive item	negative item
not at all	1	4
somewhat	2	3
moderately so	3	2
very much so	4	1

The lowest and the hightest possible raw scores in each item range from 20 to 80 and devided into 3 levels equally by arithmetic means. The interpretation of the score is as follow

20 - 40 : mild anxiety

41 - 60 : moderate anxiety

61 - 80 : severe anxiety

Validity and reliability of instruments

1. Health perception questionnaire

1.1 Content validity

The questionnaire was validated by 5 experts who were instructor of mental health and psychaitric nursing, instructor of cardio-medical nursing, expert clinician nursing:cardiology, cardiologist and clinical psychologist test the applicability of the questionnaire, and the investigator improved the questionnaire by their recommendations. (The experts'name : appendix A)

1.2 Reliability

The 26 items of health perception questionnaire used by Puasiri, S. (1988) yielded 0.71. After 4 items was added by the investigator the reliability was retested in 10 coronary artery disease patients for each investigations given alpha coeffient by Cronbach of 0.68, and total total of sample was 0.72.

2. Anxiety questionnaire

2.1 Validity

The anxiety questionnaire is the STAI of Spielberger,C.D., et al (1970), into Thai version by Cachapugdee,N., et al. (1983). The questionnaire was wildly accepted and well known.

2.2 Reliability

The Anxiety questionnaire used by Kittisup, C. (1993) and Kriadchaiyaphom, B. (1990) for state anxiety questionnaire yielded 0.89 and 0.88 and trait anxiety questionnaire yielded 0.71 and 0.89, respectively. The reliability was retested by the investigator in 10 coronary artery disease patients for each investigations given alpha

coefficient by Cronbach. The reliability of the state anxiety questionnaire before and after the investigations are .90 and .92, respectively. The reliability of the trait anxiety questionnaire before the investigation are .83. The total samples, reliability of the state anxiety questionnaires before and after the investigation are .88 and .87, respectively and trait anxiety questionnaire are .82.

Collection of the data

The investigator presented this project to the committe on human rights related to research involving human for documentary proof of ethical clearance, the Faculty of Medicine, Siriraj Hospital, Mahidol University.

The investigator followed the Recommendation of Dean of Faculty of Nursing and was allowed to collect the data from Faculty of Graduate Studies to Dean of Faculty of Medicine and Director of Siriraj Hospital for collecting data at Division of Cardiology Department of Medicine, Division of Nuclear Medicine Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital, Mahidol University. The data collection is operated every official work days, from 8:00 am. to 4:00 pm.

1. The investigator studies the patient's records of the Division of Cardiology Division of Nuclear Medicine, and Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital Mahidol University, and the patient with coronary artery disease who are planned to perform the cardiac investigation will be chosen for study.

2. The investigator introduces herself, informs the objectives of this study and asks for informed consent to participate in research which explaned their rights to withdraw at any time and gave an assurance of confidentiality.

3. The data were collected by interview, the subjects answer the questionnaires which include demographic, health perception, and state-trait anxiety questionnaires before the investigation.

4. And the subjects will answer only the state anxiety questionnaires again after the investigation.

Data analyses

The analyses were done by program computer SPSS for windows:

1. Measuring frequency and percentage of demographic data.

2. Measuring frequency and percentage of health perception, state anxiety and trait anxiety before the investigation.

3. Measuring frequency and percentage of state anxiety after the investigation.

4. Measuring arithmetic mean and standard deviation (S.D.) of health perception, state anxiety before the investigation.

5. Measuring arithmetic mean and standard deviation (S.D.) of state anxiety after the investigation.

6. The Pearson's product moment correlation (r) :

6.1 Between health perception and state anxiety, before the investigation.

6.2 Between health perception and trait anxiety, before the investigation.

6.3 Between trait anxiety and state anxiety, before the investigation.

6.4 Between trait anxiety and state anxiety, after the investigation.

7. To compare the state anxiety between before and after the investigations by t-test.

8. To compare the state anxiety before the investigation between non invasive and invasive investigations by t-test.

CHAPTER IV

Results

A descriptive correlational study was used to identify the level of health perception and state-trait anxiety in patients who were suspected to have coronary artery disease and were scheduled to undergo cardiac investigations, including non invasive investigation; exercise stress test (EST), nuclear cardiology, and invasive investigation; coronary angiography (CAG) at the Division of Cardiology, Department of Medicine, Division of Nuclear Medicine, Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital, Mahidol University.

Results

The results of this study were presented in 7 parts:

1. Characteristic of subjects;
2. Health perception of subjects before the investigation;
3. State-trait anxiety of subjects before the investigation;
4. State anxiety of subjects after the investigation;
5. The relationship between health perception and state-trait anxiety before the investigation;
6. The relationship between state anxiety and trait anxiety before the investigation; and

7. Comparison of state anxiety before and after the investigation.

Part 1. Characteristic of subjects;

One hundred and fifty patients who were suspected to have coronary artery disease participated in this study and all of them underwent cardiac investigations. They were divided equally into non invasive and invasive investigations, with seventy-five subjects in each group. The characteristics of patients e.g. sex, age, and education level, were presented in table 1. Duration of illness and severity of illness were presented in table 2. Underlying disease, smoking history and previous experience about the investigation from others were presented in table 3. Marital status, family characteristic and status, economic status and cost-responsibility were presented in table 4, and occupation and characteristic of occupation are presented in table 5.

The age was compared by the t-test. The mean score and the S.D. score are presented in table 6.

Table 1 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by sex, age and educational level. (n = 75)

characteristics		noninvasive		invasive	
		n	percentage	n	percentage
sex	male	41	54.7	40	53.3
	female	34	45.3	35	46.7
age (yrs.)	21-30	1	1.3	0	0.0
	31-40	4	5.3	3	4.0
	41-50	10	13.3	6	8.0
	51-60	23	30.7	19	25.3
	61-70	21	28.0	31	41.3
	71-80	15	20.0	14	18.7
	81-90	1	1.3	2	2.7
education level	none	6	8.0	5	6.7
	primary	36	48.0	45	60.0
	secondary	10	13.3	13	17.3
	certificate, diploma	6	8.0	5	6.7
	bachelor degree	11	14.7	6	8.0
	more than bachelor degree	6	8.0	1	1.3

As shown in table 1, forty-one subjects of the non invasive group (54.7%) and forty subjects of the invasive group (53.3%) were male. Twenty-three subjects of the noninvasive group (30.7%) and thirty-one of subjects in the invasive group had age (41.3%) ranged from 51 to 60 years and 61 to 70 years, respectively. Most of them, thirty-six of the noninvasive subjects (48%) and forty-five of the invasive subjects (60%) had education up to primary level.

Table 2 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by duration and severity of illness (FC). (n = 75)

characteristics		noninvasive		invasive	
		n	percentage	n	percentage
duration of illness					
less than 1 month		9	12.0	10	13.3
1 to 3 months		17	22.7	17	22.7
more than 3 to 6 months		5	6.7	8	10.7
more than 6 to 12 months		10	13.3	8	10.7
more than 1 to 1 and a half years		1	1.3	2	2.7
more than 1 and a half years		33	44.0	30	40.0
severity of illness	FC I	41	54.7	26	34.7
	FC II	32	42.7	36	48.0
	FC III	2	2.7	12	16.0
	FC IV	0	0.0	1	1.3

As shown in table 2, for duration of illness, thirty-three subjects of the non invasive group (44%) and thirty subjects of the invasive group (40%) had symptoms for more than 1 and a half years. For severity of illness, forty-one subjects of the non invasive group (54.7%) were in functional class I. Thirty-six subjects of the invasive group (48%) were in functional class II. No one in the non invasive subject and only one in the invasive subject had functional class IV.

Table 3 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by underlying disease, smoking history and previous experience about the investigation from others. (n = 75)

characteristics	noninvasive		invasive	
	n	percentage	n	percentage
underlying disease				
diabetes	9	12.0	6	8.0
hyperlipidemia	17	22.7	9	12.0
hypertension	6	8.0	11	14.7
diabetes and hyperlipidemia	3	4.0	6	8.0
diabetes and hypertension	5	6.7	3	4.0
hyperlipidemia and hypertension	7	9.3	14	18.7
diabetes, hyperlipidemia, and hypertension	6	8.0	11	14.7
no underlying disease	15	20.0	14	18.7
unknown	7	9.3	1	1.3
smoking history				
non smoking	45	60.0	42	56.0
ex-smoking	26	34.7	28	37.3
still smoking	4	5.3	5	6.7

Table 3 (cont.).

characteristics	noninvasive		invasive	
	n	percentage	n	percentage
previous experience about the investigation from others				
yes	12	16.0	16	21.3
no	63	84.0	59	78.7

As shown in table 3, for underlying disease, seventeen subjects of the noninvasive group (22.7%) had hyperlipidemia. Fourteen subjects of the invasive group (18.7%) had hyperlipidemia associated with hypertension and no underlying disease in each. For smoking, forty-five subjects of the noninvasive group (60%) and forty-two subjects of the invasive group (56%) were non smokers. Sixty-three subjects of the noninvasive group (84%) and fifty-nine subjects of the invasive group (78.7%) never had any experience about the investigation before their tests.

Table 4 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by marital status, characteristic of family, family status, economic status and cost- responsibility. (n = 75)

characteristics	noninvasive		invasive	
	n	percentage	n	percentage
marital status;				
married	57	76.0	51	68.0
single	4	5.3	7	9.3
widow, divorced, separated	14	18.7	17	22.7
family characteristic;				
single	48	64.0	49	65.3
extended	27	36.0	26	34.7
family status;				
leadership	42	56.0	47	62.7
membership	32	42.7	25	33.3
resident	1	1.3	3	4.0
economic status;				
not enough income for family needs	13	17.3	15	20.0
adequate income	44	58.7	43	57.3
adequate income and some saving	18	24.0	17	22.7

Table 4 (cont.).

characteristics	noninvasive		invasive	
	n	percentage	n	percentage
cost-responsibility;				
totally reimbursed	40	53.3	38	50.7
partially reimbursed	7	9.3	14	18.7
totally self paid	28	37.3	23	30.7

As shown in table 4, most subjects, fifty-seven subjects of the noninvasive group (76%) and fifty-one subjects of the invasive group (68%) were married. Forty-eight subjects of the noninvasive group (64%) and forty-nine subjects of the invasive group (65.3%) were from a single family. Forty-two subjects of the noninvasive group (56%) and forty-seven subjects of the invasive group (62.7%) were the family leader. For economic status, forty-four subjects of the noninvasive group (58.7%) and forty-three subjects of the invasive group (57.3%) had adequate income for family needs. Forty subjects of the noninvasive group (53.3%) and thirty-eight subjects of the invasive group (50.7%) received total reimbursement for hospital expenses or social welfare.

Table 5 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by current occupation, occupation before illness and characteristic of occupation. (n = 75)

characteristics	noninvasive		invasive	
	n	percentage	n	percentage
current occupation;				
employee	5	6.7	10	13.3
agriculture	4	5.3	5	6.7
merchant	10	13.3	9	12.0
business	6	8.0	1	1.3
private officer/government officer	10	13.3	7	9.3
housework	38	50.7	42	56.0
other (priest/priestess)	2	2.7	1	1.3
characteristic of occupation;				
sedentary work	68	90.7	60	80.0
non sedentary work	7	9.3	15	20.0

Table 5 (cont.).

characteristics	noninvasive n	noninvasive percentage	invasive n	invasive percentage
occupation before illness;				
employee	7	9.3	20	26.7
agriculture	7	9.3	6	8.0
merchant	14	18.7	14	18.7
business	7	9.3	2	2.7
private officer/government officer	18	24.0	18	24.0
housework	20	26.7	14	18.7
other (priest/priestess)	2	2.7	1	1.3
characteristic of occupation				
sedentary work	59	78.7	52	69.3
non sedentary work	16	21.3	23	30.7

As shown in table 5, thirty-eight subjects of the noninvasive group (50.7%) and forty-two subjects of the invasive group (56%) did housework. Most of them, sixty-eight subjects of the noninvasive group (90.7%) and sixty subjects of the invasive group (80%) were sedentary workers. For occupation before illness, twenty subjects of the noninvasive group (26.7%) did housework and fifty-nine subjects (78.7%) were sedentary workers. Twenty subjects of the invasive group (26.7%) were employees and fifty-two subjects (69.3%) were sedentary workers.

Table 6 Comparison of the age of subjects who underwent noninvasive and invasive investigations by t-test.

investigation	age (yrs.) range	mean	S.D.	p-value
noninvasive (n=75)	28 - 84	60.81	10.95	.268 ns
invasive (n=75)	35 -89	62.71	9.89	

ns = not significant, p>.05

As shown in table 6, for the age of the subjects, seventy-five subjects of the noninvasive group were in the range 28 to 84 years. The mean score of age was 60.81 with the S.D. score of 10.95. For invasive investigation, seventy-five subjects were in the range 35 to 89 years. The mean score of age was 62.31 with the S.D. score of 10.39. There were no significant differences in the age of subjects between noninvasive and invasive investigations. (p>.05).

Part 2. Health perception of subjects before the investigation;

To describe health perception before investigation of the subjects in this study, health perception scores were obtained from the subjects' perception. A descriptive analysis of health perception scores was performed. The results are shown in table 7 and 8.

Table 7 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by health perception level before the investigation. (n = 75)

health perception level	non invasive		invasive	
	n	percentage	n	percentage
good (91-120)	7	9.33	7	9.33
fair (61-90)	68	90.67	68	90.67
poor (30-60)	0	0.00	0	0.00

As shown in table 7, before investigation, most of the subjects in both investigations, noninvasive and invasive, sixty-eight subjects (90.67%) in each, had a fair level of health perception.

Table 8 Arithmetic mean and standard deviation (S.D.) stratified by categories of health perception score before investigation of subjects who underwent noninvasive and invasive investigations. (n = 75)

variable	noninvasive mean	noninvasive S.D.	invasive mean	invasive S.D.	p-value
Health perception	80.92	8.45	80.33	7.01	.656 ns
prior health	11.77	2.86	12.19	2.37	.353 ns
current health	22.24	3.96	21.99	3.28	.633 ns
health outlook	10.44	1.56	10.60	1.92	.572 ns
health worry/concern	13.87	1.73	13.45	1.45	.127 ns
resistance/susceptibility	11.05	2.23	10.81	1.89	.496 ns
sickness orientation	11.55	1.76	11.29	1.47	.377 ns

ns = not significant, $p>.05$

As shown in table 8, the mean score of health perception of noninvasive and invasive subjects were 80.92 and 80.33 with the S.D. score of 8.45 and 7.01, respectively. The mean scores and the S.D. scores of each category of health perception in noninvasive and invasive subjects were similar to the total health perception scores. There was no significant difference in total scores or in category scores of health perception between noninvasive and invasive subjects. ($p>.05$).

Part 3. State-trait anxiety of subjects before the investigation;

To describe the state anxiety and trait anxiety before investigation of the subjects in this study, the anxiety scores were obtained from the subjects' responses. The descriptive analysis of State-Trait Anxiety Inventory (STAI) scores was performed. The results are shown in table 9 and 10.

Table 9 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by state anxiety level before the investigation. (n = 75)

state anxiety level		noninvasive		invasive	
		n	percentage	n	percentage
mild	(20-40)	36	48.00	29	38.67
moderate	(41-60)	39	52.00	45	60.00
severe	(61-80)	0	0.00	1	1.33

As shown in table 9, before investigation, thirty-nine subjects of the noninvasive group (52%) and forty-five subjects of the invasive group (60%) had a moderate anxiety level. Thirty-six subjects of the noninvasive group (48%) and twenty-nine subjects of the invasive group (38.67%) had a mild level. Only one subject of invasive group (1.33%) had a severe level.

Table 10 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by trait anxiety level before the investigation. (n = 75)

trait anxiety level		noninvasive		invasive	
		n	percentage	n	percentage
mild	(20-40)	39	52.00	39	52.00
moderate	(41-60)	36	48.00	36	48.00
severe	(61-80)	0	0.00	0	0.00

As shown in table 10, before investigation, thirty-nine subjects (52%) of both noninvasive and invasive groups had a mild level of trait anxiety equally. Thirty-six subjects or 48% of both noninvasive and invasive groups had a moderate level.

Part 4. State anxiety of subjects after the investigation;

To describe state anxiety after investigation of the subjects in this study, the scores of anxiety were obtained from the subjects' responses. The descriptive analysis of State Anxiety Inventory (SAI) score was performed. The results are shown in table 11.

Table 11 Number and percentage of subjects who underwent noninvasive and invasive investigations, stratified by state anxiety level after the investigation. (n = 75)

state anxiety level		noninvasive		invasive	
		n	percentage	n	percentage
mild	(20-40)	50	66.67	51	68.00
moderate	(41-60)	24	32.00	24	32.00
severe	(61-80)	1	1.33	0	0.00

As shown in table 11, after investigation, fifty subjects (66.67%) of the noninvasive group had a mild level of state anxiety, compared to fifty-one subjects (68%) of the invasive group. Only one subject (1.33%) of the noninvasive group was at a severe level.

Part 5. The relationship between health perception and state-trait anxiety before the investigation;

To determine the relationship between health perception and state-trait anxiety before investigation of the subjects in this study, the Pearson product moment correlation was performed and the results are shown in table 12.

Table 12 Pearson correlation coefficients between health perception and state-trait anxiety of subjects who underwent noninvasive and invasive investigations, before the investigation.

Variables	Correlation Coefficient (r)	
	noninvasive	invasive
health perception and state anxiety	- .453**	- .504**
health perception and trait anxiety	- .386**	- .399**

**p < 0.01

As shown in table 12, before the investigation, there was a significant negatively correlation between health perception and state anxiety in both noninvasive and invasive group (r = -.453 and .-504, respectively). There was a significant negatively correlation between health perception and trait anxiety in both noninvasive and invasive investigations (r = -.386 and -.399, respectively).

Part 6. The relationship between state anxiety and trait anxiety before the investigation;

To determine the relationship between state and trait anxiety before and after investigation of the subjects of this study, the Pearson product moment correlation was performed and the results are shown in table 13.

Table 13 Pearson correlation coefficients between state and trait anxiety of the subjects who underwent noninvasive and invasive investigations, before the investigation.

variable	Correlation Coefficient (r)	
	noninvasive	invasive
before the investigation		
state and trait anxiety	.480**	.624**

**p < 0.01

As shown in table 13, before investigation there was a significant positive correlation between state anxiety and trait anxiety in both noninvasive and invasive group (p<.01).

Part 7. Comparison of state anxiety before and after investigation.

To describe state anxiety before and after investigation of the subjects in this study, the scores of state anxiety were obtained from the subjects' responses. The results are shown in table 14 and 15.

Table 14 Arithmetic mean and standard deviation (S.D.) of differential anxiety score before and after investigations of subjects who underwent noninvasive and invasive investigations.

	noninvasive			invasive		
State Anxiety	mean	S.D.	t-value	mean	S.D.	t-value
before investigation	42.32	7.87		42.72	7.29	
			3.916**			4.966**
after investigation	38.43	7.73		38.85	5.78	

** p<.001

As shown in table 14, before investigation, the mean scores of state anxiety of noninvasive and invasive groups were 42.32 and 42.72 with S.D. score of 7.87 and 7.29, respectively. After investigation, the mean scores of state anxiety of noninvasive and invasive groups were 38.43 and 38.85 with S.D. score of 7.73 and 5.78, respectively. After investigation, the state anxiety score of noninvasive subjects was lower than before investigation ($p < .001$). Similarly, the invasive group state anxiety scores after investigation were lower than before investigation ($p < .001$).

Table 15 Comparison of state anxiety before and after investigations between noninvasive and invasive investigations by t-test.

Investigations	state anxiety/before			state anxiety/after		
	mean	S.D.	p-value	mean	S.D.	p-value
noninvasive	42.29	7.88	0.854 ns	38.31	7.79	0.634 ns
invasive	42.52	7.16		38.84	5.77	

ns = not significant, p>.05

As shown in table 15, for noninvasive investigation, the mean scores of state anxiety before and after investigation were 42.29 and 38.31 with the S.D. score of 7.88 and 7.79, respectively. For invasive group, the mean scores of state anxiety before and after investigations were 42.52 and 38.84 with the S.D. score of 7.16 and 5.77, respectively. Before and after investigation, state anxiety scores of noninvasive and invasive groups were no statistically significant difference (p> .05).

CHAPTER V

Discussion

The purpose of this descriptive research was to determine the health perception, anxiety and the relationship between health perception and anxiety. The subject was 150 patients with coronary artery disease who underwent cardiac investigations, divided equally into noninvasive and invasive investigations. The subjects have never been tested before.

Hypotheses 1 and 2 The health perception of patients before their noninvasive and their invasive investigations are correlated to state and trait anxiety. The results of this study: both noninvasive and invasive investigations revealed that, there was significant negatively correlation between health perception and state anxiety as same as health perception and trait anxiety ($p<.01$).

Hypothesis 3 The state anxiety of patients before their non invasive and their invasive investigations are correlated to trait anxiety. The results of this study: before noninvasive and invasive investigations, there was significant positive correlation between state anxiety and trait anxiety ($p<.01$).

Hypothesis 4 The state anxiety of patients after their investigation is lower than before the investigation both noninvasive and invasive investigations. The results of this study: both noninvasive and invasive investigations, the mean score of state anxiety after the investigation was significant lower than before the investigation ($p <.01$).

Hypothesis 5 The state anxiety of patients underwent noninvasive and invasive investigations before their investigations are not different. The results of this study: before the investigations, the mean scores of state anxiety was not significantly different between noninvasive and invasive investigations ($p>.05$).

In this study, demographic data of noninvasive and invasive subjects were similar. The results of health perception and state-trait anxiety before investigations and state anxiety after investigations were also similar. Therefore the relationship and comparison of variables may be discussed as follows.

Koizer and Erb (1998:75-6) described that health perception is the acceptation of someone on his or her health and based on the individual's knowledge and experiences. The perception of humans has three stages: transitional period, period of acceptation and restitution period. Besides, health perception is an adaptive processe of health acceptation. Good adaptation leads to good health and maladaptation leads to illness or sickness. There are many factors that effect health perception such as the development status, social and culture influences, previous experiences and expectation of themselves.

Moreover, social elements such as social status, marital status, interactions with other people, education, occupation, major life alterations and risk of coronary artery disease modification are impacted on health perception. In this study, most of noninvasive and invasive subjects (90.67%) had a fair level of health perception and no one had poor health perception (table 8). Most of them were male, married, family leader and had fair to good socioeconomic status. The mean age was 60.81 of noninvasive and 62.71 of invasive subjects and also finished their education at primary to secondary school (61.3% of noninvasive and 77.3% of invasive subjects).

As to this study, the findings were similar to previous studies that coronary artery disease patients had good health perception (Pringpurd, S.1995, Voranan, P.1998, Yoswattana, R.1992). Most subjects in these three studies were male, age over 56 years and had a primary school education.

Experiences, both direct and indirect, of the subjects about coronary artery disease help them to take care of their health and able them to understand the usefulness and necessity of their investigations. The two groups in this study were suspected to have coronary artery disease and were scheduled to have cardiac investigations. They had never been tested by any investigation and also had no knowledge about this investigation. All of these subjects were routinely informed before receiving the investigation. However, before the appointed date, the subjects may gain some information or experience that would help them in adjusting to a new perception. Health perception was assessed by the patietns themselves that needed time to change. The duration of two weeks were not enough to change their health perception because the previous study of health perception in myocardial infarction patients found that health perception score between constructive education and routinely advised was not statistically significant. In the same study health perception score immediately after constructive education and two weeks after discharged from the hospital was not different (Hankunakul, W. 1995).

Unlike the previous study our patients had enough time to change their perception. Most of the subjects had duration of their illness more than 1 and a half years and the appointed date for these investigations in our institute they had a period of time 3-6 weeks.

Wolkman & Stricker (1994:77) described that the level of anxiety would also effect health perception. Anxiety involves an individual's cognitive, physiological motivational, affective and behavior systems. Mild anxiety actually heightens sensory awareness. Moderate or severe anxiety level leads to distort health perception.

The characteristics of anxiety can be divided into state and trait anxiety. Trait anxiety is an individual's stability difference responding to certain types of highly stimulating situations (Spielberger, et al., 1988:103). State anxiety is a functional and emotional disorder and may vary in intensity and fluctuation over the time. Trait anxiety influences on state anxiety (Spielberger, et al., 1988:241).

In the patients who underwent cardiac catheterization had much anxiety during the waiting time on the day of test (Peterson, 1991:643). In the first cardiac catheterization subjects had experienced anxiety before and after investigations (Davis, et al., 1994:140) and they had a fear of the unknown and outcomes that might affect their future (Beckerman, Grossman, & Marquez, 1995:213).

In this study, health perception of the subjects before the investigation, both noninvasive and invasive groups, were negative correlated to state and trait anxiety (table 13). The study of health perception and anxiety in cardiac investigations can not be found, there was only one study on health perception and anxiety in normal primigravida aldolescent (Meesawat, C. 1996) found that there was a significant positive correlation between health perception and self-care ($p<.01$) but the correlation between anxiety level and self-care was negatively significant ($p<.001$).

In this study, before the investigations, most of the subjects had moderate level of both state and trait anxiety (table 10 and 11, respectively) and the state anxiety was positively correlated to trait anxiety (table 13).

There were few studies about state and trait anxiety in pre-operative patients and found that most of the subjects had mild to moderate anxiety (Kamwicha,P.1991, Kriadchaiyaphom,B.1990, Naka,K.1991). There was a positive significant correlation between state and trait anxiety (Naka,K.1991).

This study found that state anxiety was significantly decreased after investigation, both noninvasive and invasive groups ($p<.001$). The results of the investigations were informed and discussed to the majority of the patients immediately after investigations. At first they may be frightened and afraid but they should get better later after they felt that everything that was performed was suitable and useful for their health and they also perceived that every medical personal tried to help them. Although, their conditions were severe but they felt that they had a chance to survive. The perception of the patients in each step made them awear to prepare the patients to face unexpected thing and being awear of their future and empowered them to face their illness. After investigation, the diagnosis and further mangement of treatment were clear cut, so they got better. It was supported by the study of Damrongvadha, T., & Tantitham, C. (1996) that the subjects experienced a moderate level of state anxiety before cardiac catheterization and significantly decreased after cardiac catheterization. This was also supported by the study of Degchaiyun, Y., & Tansupasiri, P. (1998) that the state anxiety of the patients undergone cardiac catheterization at the time of dicharge was lower than admission. However, 32% of noninvasive and invasive patients in our study still had a moderate level of state anxiety after investigations.

This study shows that state anxiety before the investigation between noninvasive and invasive groups were not statistically significant (table15). This may be due to

the patients in both groups fear of the results, complications and further mangement of treatment. For noninvasive investigation, they may fear the diagnosis of coronary artery disease that could cause them sudden cardiac death and change their behaviors. As shown in table 5, sedentary work subjects were increased after their illness. For invasive patients, they fear the severity of disease and cardiac surgery or cardiac intervention. However, if they have good perception the level of anxiety may not be high.

CHAPTER VI

Conclusion

This study is a descriptive research to study the health perception, anxiety and relationship between health perception and anxiety in patients with coronary artery disease who were planned for cardiac investigations. The purposive sampling method was used and the sample consisted of patients who were suspected to have coronary artery disease and were scheduled to have cardiac investigations including non invasive investigation, exercise stress test (EST) and nuclear cardiology, and invasive investigation, coronary angiography (CAG) at the Division of Cardiology, Department of Medicine; Division of Nuclear Medicine, Department of Radiology and Her Majesty's Cardiac Centre, Faculty of Medicine, Mahidol University.

The instruments in this study include;

1. The demographic questionnaire.

2. The health perception questionnaire which was developed from the General Health Perception Battery of Brook, et al (1979) translated into Thai language by Puasiri, S (1988) and was adapted by the investigator.

3. The state-trait anxiety questionnaire were adapted from State-Trait Anxiety Inventory (STAI) of Spielberger, et al (1970) which was translated into Thai language and developed by Cachapugdee, et al (1983) with permission.

Collection of the data

The investigator presented this project to the committee on human rights related to research involving humans for documentary proof of ethical clearance, the Faculty of Medicine, Mahidol University. Then the investigator was allowed to collect data from the Dean of the Faculty of Medicine, Mahidol University. Data collection is operated every official work day. The investigator studied the patients' records and they were then selected for this study. The subjects were informed of the objectives of the study and asked to participate and were then told of their right to withdraw at anytime and given an assurance of confidentiality. The data were collected by the investigators interviews. The subjects answered the demographic, health perception, state and trait anxiety questionnaire before the investigations and answered the state anxiety questionnaire again after the investigations.

The data analyses were done by computer program SPSS for Windows. Category variables were counted and presented as frequency and percentage. Continuous variables, e.g. age, health perception and anxiety scores, were presented as mean ± S.D. and compared by using Pearson's product moment.

Results

1. Before noninvasive and invasive investigations, there was significant negative correlation between health perception and state anxiety ($p < .01$).

2. Before noninvasive and invasive investigations, there was significant negative correlation between health perception and trait anxiety ($p < .01$).

3. Before noninvasive and invasive investigations, there was significant positive correlation between state anxiety and trait anxiety ($p < .01$).

4. For both noninvasive and invasive investigations, the mean score of state anxiety after the investigation was significant lower than before the investigation ($p < .001$).

5. Before the investigations, the mean score of state anxiety were not significantly different between noninvasive and invasive investigations ($p > .05$).

Limitations of the study

1. This study was not conclude all psychological variables which influnce the perception and anxiety such as the uncertainty and personality type of the subjects.

2. The study setting was only at Siriraj Hospital.

3. This study was limited by time, only 3 months for data collection and studied in the first cardiac catheterization patients. The samples were selected by purposive sampling so they might not be representative of all coronary artery disease patients.

Recommendations for further study

1. The other psychological variables that influence the perception and anxiety such as uncertainty and personality type of subjects should be study.

2. The population of the study should be collected from various hospitals that perform the same cardiac investigations as this study.

3. The sampling technique should be use the randomized sampling technique.

4. Further studies should be conducted both in first and previous cardiac investigations patients and compared health perception and anxiety between these two groups.

Implications of the findings

The results of this study showed that health perception and anxiety are negatively correlated. The cardiac nursing role should therefore promote the health perception of patients with coronary artery disease. The patients should be advised to look after themselves, including practical knowledge about coronary artery disease, risk factors and how to prevent risk factors, health promoting factors and how to improve health behavior.

In the new era, nurses should try to improve the health providers' attitude and try to understand the patients'problems and help to solve them. An information advice service staff by nursing personal should be available, to offer counseling every noon on official days, and a hot line for serious problems.

The trait anxiety is commonly unchanged but state anxiety is vary over the time. Patients undergoing cardiac investigations reported state anxiety at mild and moderate levels. While waiting for the investigation, their surroundings should be able to motivate them at all times. Nurse should try to decrease the patients' anxiety. Suspected coronary artery disease patients and patients with coronary artery disease should be introduced to each other so they may share experiences and their perceptions. While they are waiting for their investigation, nurses must correct their perceptions and advise them of practical knowledge that they should know.

Although the investigations are finished and results are obtained; the patients still need some help, especially in decreasing their anxiety levels. Cardiac nurses should aware that the cardiac investigation itself can induce anxiety in both noninvasive and invasive subjects and both before and after investigations. Therefore, cardiac nurses should concern with all the patients and in every investigation. On the way to doing that, nurses should give practical knowledge and take care to be sympathetic. These are important roles of nursing which are the indirect ways to keep patients well being.

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Appendix

Appendix A

The expert name

Expert clinician names are validators the instruments.

1. Asst. Prof. Dr. Yajai Sitthimongkol
   Department of mental health and psychiatric nursing.
   Faculty of nursing. Mahidol University.

2. Assoc. Prof. Suavaluck Lekutai
   Department of medical nursing.
   Faculty of nursing. Mahidol University.

3. Mrs. Boobpa Sedpo
   Siriraj Hospital
   Faculty of medicine. Mahidol University.

4. Prof. Dr. Yongyuth Sahasakul
   Division of cardiology. Department of medicine.
   Faculty of medicine. Mahidol University.

5. Lect. Dr. Wajjanin Rohitsuk
   Department of psychiatry.
   Faculty of medicine. Mahidol University.

Appendix B

The questionnaire

- Inform consent note.
- Demographic data.
- Health perception.
- State-Trait Anxiety.

Consent form

To whom it may be concern.

My name is Suchada Raungratanaamporn. I am a master student at the Faculty of Graduate Studies, Mahidol University. My research is "The Study of Health Perception and Anxiety in Patients with Coronary Artery Disease Undergoing Cardiac Investigations". I need your help in this study.

If you decide to participate, please answer the questionnaires 2 times, before and after the investigation.

Your decision to participate in the study is absolutely voluntary and you may withdraw from the 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,

S. Raungratanaamporn

Code ...../.....

Demographic questionnaire

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1. HN .....
2. Age ..... 1( )( )
3. Sex. 2( )

( ) male ( ) female

4. Marital status. 3( )

( ) married ( ) single, never married

( ) widowed /divorced /separated

5. Educational status. (check highest level completed) 4( )

( ) none ( ) primary school

( ) secondary school ( ) certificate, diplomate

( ) bachelor degree ( ) more than bachelor degree

6. Current occupation 5( )

( ) employee ( ) agriculture

( ) merchant ( ) business

( ) private officer/government officer

( ) housework

Characteristic of occupation 6( )

( ) sedentary work ( ) non sedentary work

7. Occupation before illness was ..... 7( )

Characteristic of occupation 8( )

( ) sedentary work ( ) non sedentary work

Code ...../.....

8. Family characteristic 9( )

( ) single family ( ) extended family

9. Family status 10( )

( ) leader ( ) member

( ) resident

10. Has anybody in your family or anyone you know been tested by the same cardiac investigation as you? 11( )

( ) yes ( ) no

11. Economic resourses 12( )

( ) not enough income for family needs

( ) adequate income

( ) adequate income and some saving

12. The person who is responsible for your payment 13( )

( ) totally reimbursed or insurance

( ) partially reimbursed

( ) totally self paid

13. Length of time that you have had cardial symptoms 14( )

( ) less than 1 month

( ) 1 to 3 month

( ) more than 3 month to 6 month

( ) more than 6 month to 12 month

( ) more than 1 year to 1 and half years

( ) more than 1 and half years

Code ...../.....

14. Have you previously had any disease or symptom like this? 15( )

(can give more than one answer)

( ) diabetes

( ) hyperlipidemia

( ) hypertension

( ) not at all

( ) unknown

15. Smoking history 16( )

( ) none

( ) ex-smoker

( ) smoker

Investigator form

Date ...../...../.....

FC .... 17( )

Test .....

Indication ..... 18( )

Results ..... 19( )

Plan management ..... 20( )

Complication ..... 21( )

Remarks .....

Health Perception Questionnaire

Please choose the answer that is closest to your opinion of your health status. Do not worry about the answer because these sentences have no true or false answer.

Criteria to choose the answer.

1 means definitely false
2 means mostly false
3 means mostly true
4 means definitely true

Code ...../.....

Health perception	definitely true	mostly true	mostly false	definitely false

1. According to the doctors I've seen, my health is now excellent. ..... ( )
2. I seem to get sick a little easier than other people. ..... ( )
3. I feel better now than I ever have before. ..... ( )
4. I will probably be sick a lot in the future. ..... ( )
5. I never worry about my health. ..... ( )
6. Most people get sick a little easier than I do. ..... ( )
7. I am somewhat ill. ..... ( )
8. In the future, I expect to have better health than other people I know. ..... ( )
9. I was so sick once I thought I might die. ..... ( )
10. I'm not as healthy now as I used to be. ..... ( )
11. I worry about my health more than other people worry about their health. ..... ( )
12. My body seems to resist illness very well. ..... ( )
13. Getting sick once in a while is a part of my life. ..... ( )
14. I'm as healthy as anybody I know. ..... ( )
15. I think my health will be worse in the future than it is now. ..... ( )

Code ...../.....

Health perception	definitely true	mostly true	mostly false	definitely false
16. I've never had an illness that lasted a long period of time.				( )
17. Others seem more concerned about their health than I am about mine.				( )
18. My health is excellent.				( )
19. I expect to have a very healthy life.				( )
20. My health is a concern in my life.				( )
21. I accept that sometimes I'm just going to be sick.				( )
22. I have been feeling bad lately.				( )
23. I have never been seriously ill.				( )
24. When there is something going around, I usually catch it.				( )
25. Doctors say that I am now in poor health.				( )
26. I feel about as good now as I ever have.				( )
27. I never expected I would get heart disease.				( )
28. Heart disease is common at my age.				( )
29. If I am more concerned with my health, then my sickness will not be as serious.				( )
30. If I follow the suggestion of the doctors and nurses, the sickness can be controlled.				( )

Remarks .....

Code ...../.....

State Anxiety Questionnaire

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then choose the answer that the right of the statement to indicate how you feel right now, that is, **at this moment.** There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seem to describe your present feeling best.

1 means not at all
2 means somewhat
3 means moderately so
4 means very much so

1. I feel calm .....
2. I feel secure .....
3. I am tense .....
4. I feel strained .....
5. I feel at ease .....
6. I feel upset .....
7. I am presently worrying .....
8. I

...

...

...

17. I
18. I feel confused .....
19. I feel steady .....
20. I feel pleasant .....

Code ...../.....

Trait Anxiety Questionnaire

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then choose the answer that the right of the statement to indicate how you feel ..... There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seem to describe your ..... feeling best.

1 means not at all
2 means somewhat
3 means moderately so
4 means very much so

1. I feel .....
2. I feel .....
3.
4.
...
...
...
17.
18.
19. I feel .....
20. I feel .....

BIOGRAPHY

NAME	Mrs. Suchada Raungratanaamporn
DATE OF BIRTH	6 October 1956
PLACE OF BIRTH	Pathom thani, Thailand
INSTITUTIONS ATTENDED	Chulalongkorn University, 1980 - 1982: Bachelor Education(Nursing Education) Sukothai thammathirat Open University, 1988 - 1990: Bachelor of Education (Early Chilhood Education) Mahidol University, 1997 - 1999: Master of Nursing Science (Adult Nursing)
POSITION & OFFICE	1978 - 1988, Division of Nursing, Siriraj Hospital, 1988 - Present, Division of Cardiology, Department of Medicine, Siriraj Hospital, Faculty of Medicine, Mahidol University Position : Clinical Nurse Spectialist (CNS), Non invasive Cardiology