FACTORS INFLUENCING ADAPTATION IN HEART FAILURE PATIENTS

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ABSTRACT

This study was a predictive research which aimed at examining factors that influence the ability for adaptation of heart failure patients. The sample was composed of 109 patients with heart failure of stage B or stage C who followed up at heart clinic of outpatient department, Chest Disease Institute. They were 18 years old and older. The instrument for collecting data consisted of 3 parts:
1) a demographic data questionnaire; 2) the Center for Epidemiologic Studies Depression (CES-D) questionnaire of which the alpha value scale was 0.88; and
3) an adaptation questionnaire of which the alpha value scale was 0.79. Data were collected from October to November 2007. The obtained data were analyzed using descriptive statistics, the Pearson's Product Moment correlation coefficient and the enter type of multiple regression analysis.

The findings showed that the adaptation of the sample was at a fair level (mean= 71.50, S.D. = 10.19), and there was no depression (mean = 7.22 S.D. = 7.67). Depression was significantly and negatively related to adaptation ($r = -.397$, $p<.01$). Income and educational level were significantly and positively related to adaptation ($r = .269$, $p<.01$; $r = .207$, $p<.05$). The factors which could significantly predict the adaptation of the sample included depression, income, and educational level with a p-value of .000, .021, and .033, respectively. The β of depression, income, and education were -.453, .205, and .203, respectively. Certain factors comprising gender, age, marital status, education, income, duration of illness, stage of heart failure and depression could simultaneously explain the variance of the adaptation by 29.2 % (Adjusted R square = .235, R square = .292) with a statistical level of .05.

This study suggested that nurses need to assess depression in young patients with heart failure, especially in low income patients with various stages of heart failure. Nursing intervention for the prevention of depression in heart failure patients should be emphasized in order to gain more adaptive health behavior.

KEY WORDS: ADAPTATION / DEPRESSION / HEART FAILURE

147 pp.

ปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว (FACTORS INFLUENCING ADAPTATION IN HEART FAILURE PATIENTS)

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บทคัดย่อ

การศึกษาครั้งนี้เป็นการศึกษาวิจัยเชิงทำนาย เพื่อศึกษาปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว กลุ่มตัวอย่าง คือ ผู้ป่วยโรคหัวใจที่ยังไม่มีอาการภาวะหัวใจล้มเหลว และเคยมีอาการภาวะหัวใจ ล้มเหลว ที่เข้ารับการตรวจรักษาในแผนกผู้ป่วยนอกอายุรกรรมหัวใจ สถาบันโรคทรวงอก จังหวัดนนทบุรี จำนวน 109 ราย เก็บข้อมูลด้วยแบบสอบถามในระหว่าง เดือนตุลาคม ถึง เดือนพฤศจิกายน พ.ศ. 2550 เครื่องมือที่ใช้ คือ ข้อมูลส่วนบุคคล แบบสอบถามภาวะซึมเศร้า และแบบสอบถามการปรับตัว วิเคราะห์ข้อมูล โดยใช้สถิติเชิงพรรณนา ค่าสัมประสิทธิ์สหสัมพันธ์ของเพียร์สัน และการวิเคราะห์ถดถอยเชิงพหุแบบปกติ

ผลการศึกษา พบว่า กลุ่มตัวอย่างมีการปรับตัวระดับปานกลาง (mean = 71.50, S.D. =10.19) และไม่มีภาวะซึมเศร้า (mean = 7.22, S.D. = 7.67) โดยภาวะซึมเศร้ามีความสัมพันธ์ทางลบกับการปรับตัวอย่างมีนัยสำคัญทางสถิติ (r = -.397, p, .01) รายได้ และระดับการศึกษามีความสัมพันธ์ทางบวกกับการปรับตัวอย่างมีนัยสำคัญทางสถิติ (r = .269, p<.01; r =.207, p<.05) ตามลำดับ และเมื่อวิเคราะห์ถดถอยพหุคูณ พบว่า ภาวะซึมเศร้า รายได้และระดับการศึกษาสามารถทำนายการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลวอย่างมีนัยสำคัญที่ระดับ .001, .021, และ .033 ตามลำดับ ซึ่งภาวะซึมเศร้า รายได้และระดับการศึกษามีอำนาจการทำนายการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลวอย่างมีนัยสำคัญทางสถิติ (β = -.453, .205 และ .203; p < .05) ตามลำดับ ซึ่งปัจจัยบางประการ ได้แก่ เพศ อายุ รายได้ สถานภาพสมรสระดับการศึกษา ระยะเวลาในการเจ็บป่วยและภาวะซึมเศร้าสามารถร่วมกันทำนายการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลวได้ร้อยละ 29.2 (R square = .292, p < .05)

ข้อเสนอแนะจากการศึกษาครั้งนี้ คือ พยาบาลควรประเมินภาวะซึมเศร้าในผู้ป่วยภาวะหัวใจล้มเหลวอย่างสม่ำเสมอ โดยเฉพาะผู้ป่วยอายุน้อยที่มารับการรักษาในโรงพยาบาล และการวางแผนปฏิบัติการพยาบาลที่ครอบคลุมปัญหาของผู้ป่วยรวมทั้งป้องกันภาวะซึมเศร้าและส่งเสริมให้ผู้ป่วยปรับตัวได้อย่างเหมาะสมต่อไป

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CHAPTER I
INTRODUCTION

Background and Significance of the Study

Heart failure is a chronic illness that tends to develop to severe condition eventually. In the United States of America, the number of new patients with heart failure has risen from 400,000 annually to 550,000 (American Heart Association (AHA), 2001; 2005). The incidences of heart failure are associated with advancing age and increased number of aging population. It is reported that approximately 80% of hospitalized patients with heart failure are older than 65 years (Masoudi, Havranek, & Krumholz, 2002). A cohort study in Scotland in 12,640 patients whose average age was 74 years and were newly diagnosed with heart failure, reported that 23% of these patients died during the hospitalization and 50% died within three years after the diagnosis (Khand, Gemmell, Rankin, & Cleland, 2001). The risk of heart failure is related to the advancing age as it is found that the risk of having the illness is 0.9% during 55-64 years of age, 4% in 65-74 years of age, 9.7% in 75-84 years of age, and 17.4% in people older than 85 years (Bleumink et al., 2004). Regarding epidemiology, the incidences of heart failure can be categorized by gender. For adults patients aged 50- 59 years, the prevalence of heart failure is 0.8% in both men and women. At older age, however, the incidences of heart failure in women are 10.9 / 1000 whereas the incidences in men are 10.5 / 1000; in other words, the illness is found in one out of every six women and in one out of every nine men (Lloy-Jones et al., 2002). The higher incidences of heart failure in women, in comparison with men, is particularly apparent at the age of 80 – 89 years, as the incidences rate in women increase to 7.9% whereas the rate of heart failure in men is 6.6% (Ho, Pinsky, Kannel, & Levy, 1993).

According to the statistical record of the Ministry of Public Health, Thailand, the mortality rate from cardiovascular disease was 56.2 per 100,000 persons in 2001; and this number increased to 59.1 in 2005. The death rate from heart failure in 1997 was 71.1 per 100,000 persons; and in 2005 the rate was 24.5 per 100,000

persons (Public Health Record, Ministry of Public Health, 2005). Medical Record from the Chest Diseases Institute reported that the number of patients with heart disease was 4,260 in the year 2000, and this number increased to 7,398 in 2005 (Medical Record Division, Chest Diseases Institute, 2005). It is evident that the morbidity rate of heart failure has been increasing whereas the mortality rate tends to decrease. This is because of the advancement in modern medical technology contributes to effective care and treatment thus prolonging the patients' life. Nevertheless, the development of illness causes reduction in efficiency of heart contraction, leading to poor prognosis. Patients with heart disease may receive supportive and symptomatic treatments but they remain at high risk of heart failure recurrences with increasingly severe symptoms (Hunt et al., 2005). Because of these factors, heart failure has substantial impact on the physical, mental, social, and economic aspects of the patients. Therefore, the conditions should be brought under control and continuous treatment is essential.

It is evident that heart failure is a national health problem with substantial economic impact in many countries. In 1995, the AHA/ACC developed the first guideline for medical assessment and treatment of patients with heart failure (ACC / AHA, 1995). The guideline was later amended in 2001 and in 2005. In this guideline, heart failure is classified into four stages (Hunt et al., 2005). They are as follows:

Stage A: Patient is at risk for developing heart failure because of hypertension, atherosclerotic disease, dyslipidemia, diabetes, obesity, smoking, history of cardiotoxic drug use, or family history; but at this point, the patient doesn't have cardiac structural disorder or any signs and symptoms of heart failure.

Stage B: Patient has no heart failure symptoms, but has structural heart disease, such as abnormal left ventricular function, left ventricular hypertrophy, myocardial infraction or valvular disease, and the patient is at risk for progression to heart failure.

Stage C: Patient has past or current heart failure symptoms associated with structural cardiac disease such as advanced ventricular remodeling including shortness of breath and fatigue. The patient also has reduced exercise tolerance.

Stage D: Patient has advanced refractory heart failure and symptomatic at rest or with minimal exertion despite maximal medical therapy e.g. those who are recurrently hospitalized or cannot be safely discharged from the hospital without specialized intervention.

The above classification is aimed to identify the risk factors contributing to heart failure so that patients in each stage receive appropriate treatment and the progression of illness is prevented before the occurrence of left ventricular dysfunction (LVD). It is different from functional classification by the New York Heart Association (NYHA), in which the stages of heart failure are classified according to the severity of illness as evaluated from exercise tolerance (Hunt et al., 2005). In the NYHA classification, heart failure class I is equal to the stage B of illness, in which the patient already has pathological condition; heart failure at stage C is classified as class II and III; and stage D is classified as class IV (Woods, Froelicher, Mostzer, & Bridges, 2005). Most of the previous studies investigated patients with heart failure on the basis of the functional classification of NYHA. There is no any study that used the stage of heart failure as a variable on the adaptation of patients with heart failure.

Heart failure not only has impacts on patients' physical adaptation but it also has impacts on psychological and social adaptation (self-concept). It is difficult to determine whether the present symptoms result from physical or psychological factors because of the interrelation of body and mind (Moser & Worster, 2000). In stage A of heart failure, patients do not have any symptoms of illness because there is no structural disorder and no cardiac dysfunction, thus there is no adjustment to heart failure. In stage B, the patients still have no signs and symptoms of heart failure but the structural disorder and cardiac dysfunction have already occurred and the patients need to adapt to prevent heart failure. However, the condition rarely has impact on the patients. In stage C of heart failure, the patients have symptoms of illness and they

suffer from shortness of breath, fatigue, palpitation, and edema. They cannot enjoy their lives to the full potential like other people and they feel that their lives are confined or restricted and out of control. They feel insecure and uncertain about their future. Such feeling of losing power over their life leads to problems in adaptation regarding self-concept (Pattananimarn, 1989). If the patients refuse to accept that they are ill and do not accept the required treatment, they also suffer from adaptation problems. A study has shown that patients with no perceived risk, severity and benefits of treatment demonstrate poor health behavior and decreased compliance with the treatment (Krervanichakit, 1988). Patients in stage D of heart failure are hospitalized of severe conditions and they require constant medical treatment, both from medicines and equipments thus the adaptation is not noticeable though they may already have adaptation failure.

Patients with heart disease need to adjust their lifestyle and accept a number of restrictions such as limited sodium and water intake, monitoring and assessment of edema, resting, performance of daily activities at level suitable to their capacity, and compliance with drug treatments, medical advices and follow-up appointments (Van Der Wal, Jaarsma, & Velldhuisen, 2005). This is because the patients may have to live with heart failure for the rest of their life, thus they may have to comply regularly with the new lifestyle. Non-compliance may lead to exacerbation of symptoms and the recurrence of illness may be so critical to the extent of death. Moreover, the patients need to be aware of their conditions so that they can live with high level of quality of life and well-being (Cleland et al., 2003; Horowitz, Rein, & Leventhal, 2004).

Heart failure constantly progresses, causing patients to feel uncertain about their future. They live with fear of death that may happen at anytime. The treatment can relieve symptoms but the patients may realize that the condition is incurable and the symptoms may become increasingly severe. Thus, they feel discouraged and dispirited; and, consequently, they do not perform their functions or maintain their roles. The patients may also become dependent on family members or other people. For the adaptation to develop balance in their performance of family and social roles, the patients need support and help from close and intimate people. Spouses, in particular, have significant role in the adjustment of married patients because a couple’s mutual love and respect can compensate the sense of loss and changes in

daily life (Joung, 1997). Patients' spouses are also significant sources of support in encouraging the patients to develop self-care behavior. The patients are not lonely and they feel the warmth, care, and mentally supported. On the other hand, patients who do not have support from the spouses they may react with rejection, withdrawal, isolation, or aggression; and they may have the sense of self-worthlessness or low self-esteem. These psychological impacts have effect on the body and cardiac functions, causing progression of illness to severer condition. It is found that patients with myocardial infarction who receive low level of support from their spouses demonstrated less exercise performance and non-compliance with treatment, thus having decreased adjustment (Vongsvivut, 1993) and low quality of life (Chai-aree, 1990).

Heart failure also has economic impact on the life of the patients because the treatment involves various advanced technology in combinations with several medications, especially when the patients are admitted for hospital treatment. Some medications and medical equipments are expensive, thus the patients and their family are burdened with high medical expenses. Moreover, when they are discharged from the hospital, continuous treatment is required for the rest their lives. Therefore, the medical expenses continually increase. A study in the US in 2005 reported that total medical expense for hospitalized patients with heart failure is approximately 27.9 million US dollar (1,116,000,000 baht). The only cost of medications is estimated at 2.9 millions US dollar per year (AHA, 2005). However, there is no any definite record on the cost of treatment of heart failure patients in Thailand. Apart from medical expenses, patients with heart failure also have other expenses for the basic needs that are necessary for their conditions, including the search for appropriate self-care resources and the opportunity to receive appropriate medical care. A study in patients with myocardial infarction found that the patients have substantial expense from the costs of medications, medical care and transportation for medical appointment and emergency visits. It is also found that the patients with low income demonstrate lower level of adjustment (Panidchakul, 1993).

Long-term illness with heart failure also has social impact on the patients because they cannot fully work of their potentials or may not be able to return to work. Moreover, the patients need to take sick leave when they have exacerbations of symptoms and follow-up appointments. In addition, they may need to be excused from

some responsibilities because they are not able to perform their work efficiently. The impact on regular work leads to lack of income, followed by family problems. Some patients with heart failure need to change their careers or leave personal business to avoid the stress that has impact on the recurrence of myocardial infarction (Vongsvivut, 1993). The illness not only affects the patients' work and social role, as well as their income; but it also affects their roles in family. Thus the patients have to adjust to maintain balance between themselves and their families. The patients who realize their illness with heart disease do not only lose confidence in their physical strength but also lose self-esteem and interests in various activities, including sexual activities. It is found that about 50% of the patients with heart disease have family problems, including sex problems, with their spouses because they are afraid that sexual activities could be life-threatening (Sinthu, 1983). Moreover, the patients experience decrease in physical strength and become increasingly dependent on other people, thus being burden on their families. They feel insecure, incapable, and lack the self-pride. These feelings lead to the sense of reduced self-worth and the patients become stressed, worried, and depressed eventually (Pratt et al., 1996).

Patients with heart failure are likely to have depression mood constantly. This is common in patients with chronic physical illness and this may occur for a brief period in any stage of illness (Thomas, Friedmann, Khatta, Cook, & Lann, 2003). The occurrence of depression, in combination with heart failure, has impact on adaptation mechanism as it stimulates the neurohormonal system and the automatic nervous system (Fedhder, 1999), causing cardiac arrhythmia (Huikuri & Makikallio, 2001; Remme, 1998). It also stimulates the biochemical mechanism related to inflammation of intravascular tissue (Mann, 2002). This mechanism is associated with the formation of fibrin and coagulation disorder (Kanel, Mills, Fainman, & Dimsdale, 2001). As a result, the blood pressure and circulatory system are disturbed and the blood circulation to various body cells decreases, leading to chronic hypoxemia and insufficient blood supply to the brain, causing damage to nerve cells and dysfunction of the nervous system (Rains, 2002). Serotonin, which is neurotransmitter controlling human behavior, may be particularly affected. Insufficient serotonin leads to emotional problems such as depression, unhappiness, boredom, sleeping problems, lack of appetite, disinterest in the environment and cognitive deficits (Bennett &

Sauve, 2003). The patients may present with psychological and emotional disturbances, become confused, pessimist, indifferent, and lethargic. They may cry or feel distressed, fear, and worried. These mood disorders contribute to the failure of adaptation and increasingly severe illness.

Previous studies have shown that depression could occur in patients with heart failure by 13.9 – 77.5% (Jiang et al., 2001; Vaccanrono, Kasl, Abramson, & Krumholz, 2001) whereas the occurrence of depression in general patients is only 13 – 48% (Gottlieb et al., 2004; Skotzko et al., 2000). A study in hospitalized patients with heart failure, at an average age of 86 years, found that 56.5% of the patients had depression. In comparison with, patients at the average age of 68.5 years who did not have heart failure had depression only 29.5%. It is also found that patients with higher level of heart failure tend to have severer depression (De Geest et al., 2003). Moreover, depression is easily developed when patients with heart failure are at older age. Depression is also found associated with impairments in thoughts, memories and moods, leading to decreased perception of health status and increased fatigue, which interfere the patients' adaptation (Sabate, 2003; Yu, Lee, Woo, & Thompson, 2004). Therefore, the patients have to stay in the hospital for a longer time, and the medical expenses increase (Sullivan, Simon, Spertus, & Russo, 2002). The patients may also have complications in various systems in the body and it is difficult to improve their conditions thus increasing mortality risk (Guck, Elasser, Kavan, & Barone, 2003).

Depression results from failure of psychological mechanism. Patients may have negative feelings and thoughts towards various situations and environments that stimulate them both internally and externally. It is found that patients with acute myocardial infarction who suffer from high level of fatigue and become ill for a long period and they are able to perform fewer activities because they are worried and stressed. These conditions cause mental distress and are associated with depression (Buran, 2005). Patients who are hospitalized and have depression also demonstrate reduction in the performance of activities for daily living and for rehabilitation, as well as having decreased personal interactions (Vichittragoonthavorn, 2002). In patients with chronic heart failure, the illness may develop to critical condition at anytime. Therefore, the patients who also have depression may feel discouraged and hopeless, thus having limitations in understanding the progress of illness, the recommended

approach for self-adjustment, and long-term treatment plan (Horowitz et al., 2004). It is found that patients also have adaptation problems concerning diet restrictions and medication compliance (DiMatteo, Lepper, & Croghan, 2000) or they may not be interested in adjusting their lifestyle as the illness develops (Ziegelstein et al., 2000). Therefore, it is difficult to restore cardiac function and then the symptoms are worsen and easily recur.

Another factor affecting the adaptation of patients with heart failure is age, which is associated with the development of illness. Delayed improvement of patients with heart failure is usually found in relation with advancing age. Elderly patients have impaired cardiac function and their heart conditions may coexist with other chronic diseases thus they are at risk of complications (Naylor, 2003). Moreover, heart failure causes chronic hypoxia and insufficient blood supply to the brain; therefore, the patients are frequently dizzy, forgetful and indifferent to the environment. They also lack the learning and managing abilities and have slow body movements, leading to poorer quality of life (Bennett, Sauve, & Shaw, 2005).

Gender determines a person's primary role that differs in male and female. The appropriate behavior of men and women are defined through social cultivation, leading to differences in behavior, role, expectations, emotional and intellectual development, and emotional expression between the two genders. In Thai society, women can speak out about their sufferings and distress and the have roles in taking household responsibilities whereas men's prominent roles are producer, leader, and decision-maker, as well as being the person with strength in the family (Jirawatkul, 2003). When they are ill, men and women use different technique for problem-solving and adaptation. A study with controlled variables regarding age, ejection fraction (EF), and NYHA classification found that women demonstrate poorer adaptation in aspect of activities of daily living, physical and general health, quality of life, and social activities and functions, in comparison with men (Riedinger et al., 2001). However, it is found that the health perception and psychosocial adjustment in women is better than men (Evangelista, Kagawa-singer, & Dracup, 2001).

Level of education also influences the adaptation of patients with heart failure. Patients with high level of education and good career tend to seek information and learn about the illness. They apply their abilities and use reasons to make decisions.

Previous studies of myocardial infarction patients have shown that low level of education is associated with lower level of adaptation (Panidchakul, 1993).

Duration of illness is also associated with patients' adaptation. Short duration of illness is associated with decreased level of adaptation (Panidchakul, 1993). On the other hand, long development of illness allows patients to experience the condition, learn the reality of illness, and constantly adjust in physical and psychological balance; thus the patients can accept their illness and gain self-esteem over the period of time.

Certain factors such as gender, age, income, marital status, education level, duration of illness, and depression are contextual stimuli, which do not have direct impact on patients' adaptation. However, the coexistence of these contextual stimuli with the stage of heart failure, which is a focal stimulus, is likely to have effect on the severity of symptoms. The patients need to apply the regulator and cognator mechanism to adjust the balance in the body. The adjustment is expressed in four behavioral modes: physiological mode, self-concept mode, role-function mode, and interdependence mode. Appropriate adjustment in patients with heart failure facilitates restoration of patients' heart and physical condition, thus reducing risks of possible complications and decreasing mortality rate. Therefore, the study of factors influent the adaptation of patients with heart failure comprises gender, age, income, marital status, education level, duration of illness, and depression is interesting. The results of this study could be additional information for health care professionals to be aware of the influence of these factors on the adaptation of patients with heart failure. The information could be used as guidelines for screening depression in patients with heart failure so that they receive care for depression management. As a result, the heart failure patients are able to live with well-being and with quality of life.

Research Questions

1. How is the adaptation of heart failure patients?

2. Can the adaptation of patients with heart failure be predicted with certain factors such as gender, age, marital status, education level, income, duration of illness, stage of heart failure, and depression? And how do these factors predict the patients' adaptation?

Research Objectives

1. To study the adaptation of heart failure patients.

2. To investigate the relations and predictive power of factors such as gender, age, marital status, education level income, duration of illness, stage of heart failure, and depression on the adaptation of patients with heart failure.

Research Hypothesis

1. Certain factors such as gender, age, marital status, education level income, duration of illness, stage of heart failure, and depression are associated with the adaptation of patients with heart failure.

2. Certain factors such as gender, age, marital status, education level, income, duration of illness, stage of heart failure and depression can co-predict the adaptation of patients with heart failure.

Research Framework

Roy's Adaptation Model (Andrews & Roy, 1991) is applied in the explanation of relations between the adaptation of patients with heart failure and certain factors such as gender, age, marital status, education level, income, duration of illness, stage of heart failure, and depression in this research. People confront various circumstances in their lives and they have to adjust in order to maintain physical, psychological, and social stability. This is because a person is a whole being whose body and mind is inseparable and the change in one part has effect on the whole system. To maintain the state of well-being, a person needs mechanism for the adjustment to the stimuli or input, which could be focal, contextual or residual. In patients with heart failure, focal stimuli are the four different stages of heart failure, which have effect on the patients' adjustment. The second type of stimuli-contextual stimuli includes age, gender, marital status, education level, income, duration of illness, and depression. These contextual stimuli are associated with the patients' adjustment. The last stimuli are residual stimuli comprised of belief, attitude, and personality. They influence adaptation of people. The last type of stimuli is not included in this research. Patients involuntarily receive these stimuli through the control process. The regulator and cognator mechanism subsequently lead to effectors, which are present in four modes

of adaptation behavior: physiological, self-concept, role function, and interdependence mode. The output of this process can be either adaptation or ineffective response and it is put through the feedback mechanism to be an input for the following adaptation cycle.

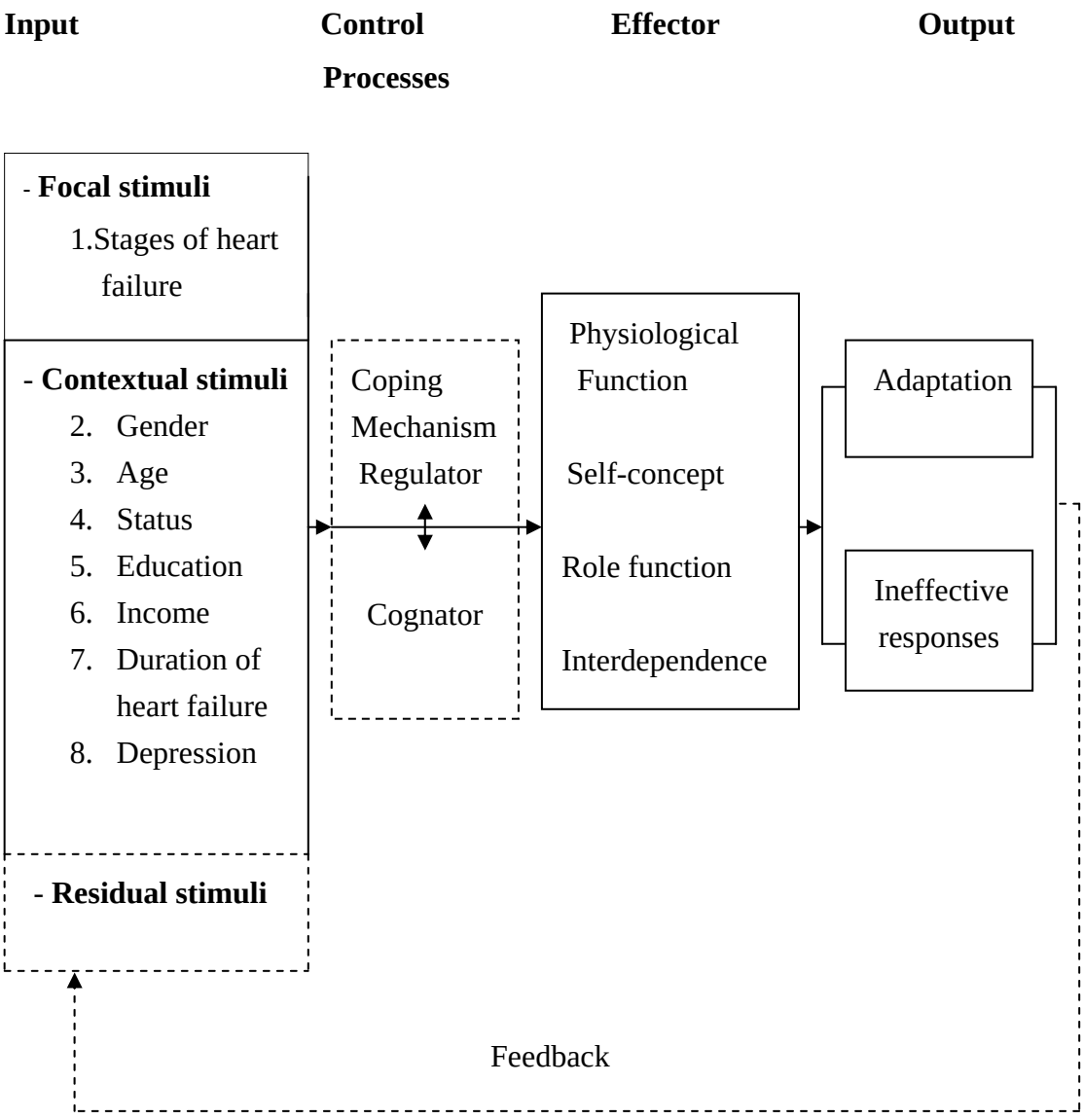

Figure 1 Conceptual Framework of the study

Scope of the Study

This research is a study of factors influencing the adaptation of patients with heart failure. It investigates the predictive power of focal stimuli–stages of heart failure, and contextual stimuli such as gender, age, marital status, education level, income, duration of illness, and depression. The study is conducted with heart disease patients who receive medial care at the outpatient clinic of the department of medical cardiology, Chest Diseases Institute, Nonthaburi Province.

Definition of Terms

1. Certain factors refer to demographic data of patients with heart failure related to gender, age, marital status, education level, income, duration of illness, and stage of heart failure. The definition for each factor is listed below.

1.1 Gender means male or female.

1.2 Age means the age of patients with heart failure in years, counting from the birth date to the day of the study. The extra age of longer than six months is counted as an additional year.

1.3 Marital status refers to the status of patients with heart failure regarding marriage, divided into married, single, divorced, widowed, and separated.

1.4 Educational level refers to the number of years the patients received formal education, counting from the beginning to the highest level.

1.5 Income refers to an average monthly income of patients with heart failure who are single. For married patients, income refers to monthly income and sufficiency of the patients and their spouse. The term also includes incomes from various sources apart from work.

1.6 Duration of illness refers to the number of months since the patients had been diagnosed with heart failure at stage B and C until the day of the study.

1.7 Stage of heart failure refers to the Stage B and C of heart failure defined by the ACC and AHA, as quoted below (ACC / AHA, 2005).

Stage B heart failure: left ventricular hypertrophy, left ventricular hypokinesia, positive regional wall motion abnormality (RWMA), ventricular dysfunction (EF< 40%), valvular heart disease.

Stage C heart failure: patients having current or prior signs and symptoms of heart failure.

The stage and functional class of heart failure are determined according to the ACC/AHA guideline and NYHA, respectively. These are confirmed by a cardiologist of Chest Disease Institute, Nonthaburi Province.

1.8 Depression refers to patients' emotional disturbances expressed as feelings of distress, sadness, despair, and hopelessness. The patients also demonstrate negative thought about themselves, the environment and the future. They become pessimistic and have low self-esteem. These feelings have effect on their health and social participations. Depression is evaluated with the questionnaire of Center for Epidemiologic Studies –Depression Scale (CES–D) (Radloff, 1977). The Thai version of this scale was translated by Wilai Kupniratisaikul and Panom Kateman (1997).

2. Adaptation refers to the behavior of patients with heart failure that reflects their abilities in response to both external and internal changes of the environment in order to maintain life stability regarding physical requirements, self-concept identity, role function, and interdependence. The patients' adaptation is measured with the questionnaire developed by the researcher on the basis of the Roy's Adaptation Model (1991). The inquiries in this questionnaire are concerned with adaptation behavior in four domains. They are as follows:

2.1 Physiological mode refers to the behavior conducted in response to basic physical requirements due to the coordinated function of endocrinology and nervous systems to maintain body balance. The requirements include oxygenation, nutrition, elimination, activity and rest, fluid and electrolytes, acid-base balance; neurological function, and endocrine function contribute to physiological adaptation.

2.2 Self-concept mode refers to the behavioral response regarding thoughts, feelings, and attitudes that the patients have toward themselves in aspects of identity, value, capabilities, and limitations. The self-concept concerning physical self involves body image, which is one's opinion about his or her appearance and function. Self-concept concerning personal self is consist of self-consistency, self-ideal and expectation, moral-ethical self, and self-esteem and self-worth (Andrews & Roy, 1999).

2.3 Role function mode refers to the expected social behavior, which has effect on the functions of various people in a society. They are classified as follows:

2.3.1 Primary role, defined by age and gender;

2.3.2 Secondary role, defined by family and occupation;

2.3.3 Tertiary role or the role of patients.

2.4 Interdependence mode refers to the patients' behavior that reflects their dependence on other people or vice versa, as well as the behavior reflecting self-dependence.

Expected Benefits of the Study

1. It is expected that the result of the study will be used by healthcare professionals to develop a plan for providing health care education and advice to the patients and their relatives with an awareness of certain factors that are influential to the patients' adaptation.

2. It is also expected that the results of this study will raise awareness of the importance of certain factors influential to the adaptation of patients with heart failure among healthcare professionals. The results will be used in the assessment of problems, provision of nursing care, and promotion of patients' appropriate adaptation to the illness.

3. The results of this study will be used for further study aiming to promote the adaptation of patients with heart failure.

4. The patients will receive indirect benefits from this study; however, their participation in giving information to the researcher will give them opportunities to talk or ask questions about the progress of illness, the treatment, and self-care practice. Thus they will appropriate advice during the study.

CHAPTER II
LITERATURE REVIEW

This study is a predictive research aiming to investigate factors which influence the adaptation of patients with heart failure. Related literatures are reviewed in details under the following topics:

1. Heart failure
    1.1 Causes of heart failure
    1.2 Mechanism of heart failure
    1.3 Physical impact of heart failure
    1.4 Psychosocial impact of heart failure
2. Adaptation of patients with heart failure
    2.1 Roy's Adaptation Model
    2.2 Adaptation of patients with heart failure in various modes according to Roy's Adaptation Model
    2.3 Some factors related to the adaptation of patients with heart failure
3. Summary

1. Heart failure

Heart failure is a complex condition resulting from disorders in cardiac structure and function that decrease ventricular efficiency, causing cardiac output reduction. Consequently, various parts of the body receive inadequate blood supply and suffer from insufficient oxygenation. The patients then present with shortness of breath, fatigue and exhaustion on exertion. They also have fluid volume excess, and this the condition may advance to pulmonary congestion, causing generalized edema (Hunt et al., 2005).

1.1 Causes of heart failure

Heart failure is a complex condition. Its major causes can be divided into two groups: cardiac and non-cardiac causes. Heart failure from cardiac causes result from disorders in cardiac structure and function that lead to alterations in cardiac structure, e.g. dilatation and / or hypertrophy of cardiac muscle causing shape alterations (Hunt et al., 2005). The risk factors of heart failure from cardiac causes include the coronary artery disease, pericardial tamponad, cardiomyopathy, hypertension, and valvular diseases. Non-cardiac causes of heart failure include the conditions not concerning with cardiac structure and function but concerning increased oxygen requirement of the body. As a result the heart works harder in response to the increased requirement to the extent that it cannot adjust to the overload of work, leading to heart failure; for example severe anemia, pregnancy, thyrotoxicosis, cardiac arrhythmia, and renal failure. In addition, the heart may also work harder because of other factors inducing increased metabolism, such as physical and mental stress, diabetes mellitus, smoking of cigarette, and obesity. Studies on heart failure in the elderly found that the most common causes are hypertension, diabetes mellitus, chronic obstructive pulmonary disease, hyperlipidaemia, and myocardial infarction (Braunstein et al., 2003; Lloyd-Jones et al., 2002; Masoudi et al., 2002).

1.2 Mechanism of heart failure

Heart function is normally depend on four factors, they are: preload, after-load, contractility, and heart rate. Preload is the ventricular end-diastolic volume, which depends on the volume of venous return. It has effect on myocardial dilatation for the enhancement of cardiac contraction efficacy and the maintenance of blood volume in blood circulation (Katz, 2000). The second factor-afterload, is the force from cardiac

contraction to emit blood out of the heart chamber. In order to open the aortic valve the pressure from this contraction must be higher than vascular resistance. The third factor is contractility which refers to the contraction of cardiac muscle which mainly depends on the function of the sympathetic nervous system. Heart rate - the last factor in heart function, has effect on the cardiac output volume in one minute: increased or decreased heart rate leads to an increase or decrease in minute volume of cardiac output, respectively. However, increased heart rate may cause decrease in the ventricular end-diastolic volume because of the reduced filling time. Therefore, heart rate higher than 180 bpm leads to decreased cardiac output, according to the Starling law. These four factors for cardiac function constantly adjust according to the blood supply requirement of various organs and tissues of the body. The adjustment usually results in sufficient cardiac output for body requirements.

Heart failure is the response to stress on the heart as various body mechanisms induce compensatory reaction to support cardiac function in order to maintain sufficient cardiac output. The heart itself has an autoregulation system. Whenever the cardiac autoregulation impairs, the preload increases and the cardiac muscle is extended thus the tension intensifies, leading to more cardiac output. If the impaired condition remains for a longer period, the heart has compensatory mechanisms to compensate and that involves reactions from various body systems. Systole is the first compensatory mechanism that instantly functions in response to acute heart failure, when the ventricle cannot pump all the blood out thus having residual blood in the chamber at the end. This residual blood then adds with the new blood from the atrium during the diastole; as a result, the ventricular end-diastolic volume is higher than usual, causing cardiac dilatation. Consequently, the force of heart contraction and stroke volume increase, as stated in Frank-Starling law of the heart (Francis, Gassler, & Sonneblick, 2001; Katz, 2000).

However, if this compensatory mechanism fails and the overload on the heart is beyond its capacity, the patient finally has heart failure. Another compensatory mechanism that automatically responds to decreased blood circulation is the baroreceptor reflex in the sympathetic nervous system (Colucci, 2000). The baroreceptor reflex reacts to decreased blood pressure as the baroreceptor cells in carotid sinus and aortic arch transmit signals to the vasomotor center in the brain,

which stimulates vasoconstriction in response. The vasoconstriction leads to increased total peripheral resistance (TPR), raising blood pressure, venous return, contractility and heart rate, thus increasing cardiac output.

The aforementioned responses occur at the same time as the compensatory mechanism from the renal and endocrine systems (Abraham & Schrier, 2000). A decrease in cardiac output causes reduction of renal blood flow as the renal artery constricts in response to the sympathetic nervous system function. The juxtaglomerular cells in the kidneys are stimulated to release rennin, which changes angiotensinogen into angiotensin-I and angiotensin-II in the liver and the lungs, respectively. These changes cause peripheral vasoconstriction to maintain normal blood pressure. Angiotensin II also stimulates the thirst center in the brain, thus increasing water consumption. Moreover, it induces the release of aldosterone thus increasing the reabsorption of sodium and water in the distal tubule and the collecting duct, leading to higher volume in the circulation system.

It is also found that noreepinephrine is released increasingly from nerve endings as a result the heart contracts harder. Other hormones are also released; for instance, vasopressin, which is an antidiuratic hormone, released from pituitary gland and has effect on reducing fluid excretion and inducing peripheral artery constriction. The changes in these hormonal releases are compensatory mechanisms for the maintenance of normal cardiac function. However, long-term increase of angiotensin II and excessive peripheral vasoconstriction may lead to excessive vascular resistance (Cody, 2000). This induces cardiac muscle dilatation and inefficient contraction. Moreover, the elevated level of aldosterone may lead to constant reabsorption of water and sodium, causing body fluid excess.

The adjustments to chronic cardiac stress also lead to myocardial hypertrophy without cell multiplication (Drexler & Hasenfuss, 2001; Francis & Pathak, 2001). Myocardial hypertrophy may occur in the atrium or the ventricle or both. It is a compensatory mechanism to increase the efficiency of heart contraction. Nevertheless, the enlarged heart requires more blood supply to cardiac muscle thus the ventricular compliance is reduced, affecting cardiac function and increasing cardiac burden if the blood supply is insufficient. These compensatory mechanisms have limitations at a certain level and long-term compensation leads to alterations in the

cardiac structure and function, as well as changes in myocardial cells (Hein et al., 2003). As heart failure progresses, myocardial contraction becomes weaker and cardiac tension increases, leading to increased oxygen requirement and premature death of myocyte. If this disorder spreads over cardiac muscle, the patient may have cardiac myopathy and, finally, heart failure. The severity of heart failure is subjective as people are different in physical and mental background. Moreover, the causes of illness, medical treatment, and self-care practice also differ in each patient.

1.3 Physical impact of heart failure

Pathology of heart failure can be found in dysfunction of the three layers of cardiac muscle, i.e. pericardium, myocardium and endocardium, as well as in the great vessels (Hunt et al., 2005). The condition mostly causes an impairment of left ventricular myocardial function, leading to physiological changes in the heart. The changes include left ventricular systolic dysfunction and left ventricular diastolic dysfunction. Cardiovascular system is closely related to other body systems thus the impairment has significant impact on other body organs. They are described below:

1.3.1 Cardiovascular system. Continuous disorder in cardiac structure and function has effect on the heart itself due to the changes in cardiac muscle, including ventricular remodeling which leads to alterations in shape, cavity size, and wall thickness. These changes cause impaired ejection and impaired filling; and the cardiac output is subsequently reduced. Other concerning organs then have reactions to raise the volume in the circulation system. Systemic edema may happen if this condition persists for a long period (Katz, 2000).

1.3.2 Respiratory system. The patients may have problems in pulmonary gas exchanges due to pulmonary hypertension, which induces increased pressure in peripheral blood vessels. The peripheral pressure beyond 28 mmHg is higher than the vascular osmotic pressure and that induces pleural effusion and imbalanced oxygen-carbon dioxide exchanges between the alveoli and capillaries. As a result, oxygen cannot mix with hemoglobin, causing hypoxemia. (Givertz, Colucci, & Braunwald, 2001; LeJemtel, Sonneblick, & Frishman, 2001)

1.3.3 Urinary system. The reduction in cardiac output leads to hypotension and renal blood flow subsequently the filtration rate decreases. As a result, urine output reduces to less than 0.5 – 1 ml per 1 kg body weight per hour or

less than 30 ml per hour (Bajar, 1999). This condition, in addition to prolonged hypotension, induces renal ischemia and necrosis. Renal function in filtration and excretion of waste product is impaired, followed by retention of fluid, electrolytes, BUN and creatinine. When urine output is less than 100 ml per day, the patient may have renal failure (Copstead & Lee-Ellen, 1995).

1.3.4 Nervous system. Decreased cardiac output leads to hypotension, and subsequently cerebral blood flow is reduced. Nerve cells then suffer from hypoxia, followed by cell damages and dysfunction of nervous system (Rains, 2002), including the dysfunction of neurotransmitters, especially serotonin – a key substance in behavior control. Low level of serotonin causes impaired memory and sleep disorder (Bennett & Sauve, 2003; Bennett et al., 2005).

1.3.5 Neurohormonal system. The reduction of cardiac output stimulates increase in functioning of the autonomic sympathetic nervous system, causing vasoconstriction and increased heart rate. Cardiac muscle contracts with harder force and in higher frequency. Prolonged stimulation from the autonomic sympathetic nervous system on the heart leads to increased total peripheral resistance and, finally, injuries of cardiac muscle (Blum & Miller, 2001). This mechanism stimulates the hormonal system as the adrenal medulla is secreted aldosterone for reabsorption of fluid and sodium, causing systemic edema (Cody, 2000; Kate, 2000).

1.3.6 Liver. When the blood cannot flow into the atrium, it returns to blood vessels in the liver and the spleen, causing atrophy of hepatic tissue which may become necrosis due to prolonged fluid retention (Givertz et al., 2001; LeJemtel et al., 2001; Patel & Konstam, 2001).

1.3.7 Generalizes appearance. When the blood from various parts of the body cannot return to the right atrium, it returns to the superior vena cava and the inferior vena cava and goes back to various body organs. This condition causes blood retention, followed by increased hydrostatic pressure. Then the fluid in the blood vessels leaks to the interstitial space causing fluid retention or generalized edema (Givertz et al., 2001; LeJemtel et al., 2001; Patel & Konstam, 2001).

1.3.8 Gastrointestinal system. The gastrointestinal blood flow is reduced because of decreased cardiac output. As a result, the gastrointestinal tract is swollen.

1.3.9 Muscular system. Decreased cardiac output causes reduction in blood flow to body organs and peripheral tissues. In a long term, this condition has effects on muscle tone. If the condition is chronic, the muscle suffers from lack of blood supply and nutrient, leading to weakness and muscle atrophy (Drexler & Hasenfuss, 2001; Kate, 2000).

The physical impacts of heart failure are reflected in physical signs and symptoms. Most patients with left-ventricle heart failure and pulmonary congestion show the following symptoms: dyspnea on exertion (DOE), orthopnea, paroxysmal nocturnal dyspnea (PND), productive cough with blood-stained sputum in some cases, cyanosis, and pulmonary edema, a critical condition that may cause death. If the patients do not receive proper treatment, the condition progresses to right heart failure, or systemic congestion, of which the pressure in the right ventricle continually increases. The symptoms of right heart failure include jugular vein distention, generalized edema, hepatosplenomegaly, ascites, flatulence, indigestion, loss of appetite, nausea, fatigue, decreased muscle tone, and muscle atrophy. The patients may also have angina pain, dizziness, confusion, diaphoresis and/or loss of consciousness. These symptoms affect their daily living or their work performance (Maneesilp, 2000).

In 1928, the Heart Disease Association proposed the classification of heart failure according to exercise tolerance The classification was based on NYHA Functional Classification, which divides the condition into 4 classes. (Lochaya, Pongpanit, & Sakonpan, 1981). They are as follows:

Class I: No limitation of physical activity. Ordinary activity doesn’t cause the patient undue fatigue, dyspnea, palpitations, or angina pain.

Class II: Slight limitation of physical activity. The patient is comfortable at rest, but ordinary physical activity causes heart failure symptoms, including fatigue, dyspnea, palpitations, or angina pain.

Class III: Marked limitation of physical activity. The patient is comfortable at rest, but less-than-ordinary physical activity causes heart failure symptoms.

Class IV: Severe limitation of physical activity. The patient has symptoms of heart failure at rest. Any physical activity increases this discomfort.

The American Heart Association proposed guidelines for the classification of the stage of heart failure in 1995. Further amendments of the guidelines were made in 2001 and 2005. This classification emphasizes cardiac risks from structural and functional disorders so that proper care and treatment can be given to the patients. (Hunt et al., 2001; 2005). Thsese guidelines also help screening new patients for the prevention of severe heart failure. The stage of heart failure classification is generally used in combination with the NYHA functional classification in clinical practice for more effective evaluation of treatment outcome. This classification divides heart failure into 4 stages, as listed below (Hunt et al., 2005):

Stage A: Patient is at risk of developing heart failure because of hypertension, atherosclerotic disease, dyslipidemia, diabetes, obesity, smoking, history of cardiotoxic drug use, or family history; but at this point, the patient doesn't have cardiac structural disorder or any signs and symptoms of heart failure.

Stage B: Patient has no heart failure symptoms, but has structural heart disease, such as abnormal left ventricular function, left ventricular hypertrophy, myocardial infraction or valvular disease, and he is at risk for progression to heart failure.

Stage C: Patient has past or current heart failure symptoms associated with structural cardiac disease such as advanced ventricular remodeling including shortness of breath and fatigue, reduced exercise tolerance.

Stage D: Patient has advanced refractory heart failure and symptomatic at rest or with minimal exertion despite maximal medical therapy; for example, the patients who are recurrently hospitalized or cannot be safely discharged from the hospital without specialized intervention.

1.4 Psychosocial impact of heart failure

Psychological impacts of heart failure differ in each stage of illness. For patients who do not have symptoms of heart failure, i.e. Class I or Stage A and B, they do not have limitations in performing daily activities and they have activities of daily living, as well as working, as usual. The patients who are at risk or those in Stage A of heart failure should have modification in lifestyle, which may not have physical or psychological impacts. When the illness progresses to chronic condition and the patients start to have symptoms or have experience of heart failure (Class II and III or Stage C), the reduction of cardiac efficiency causes dyspnea on exertion and the patients are not able to perform activities as usual. Therefore, they are dependent on other people and become a burden to other family members. At the beginning of illness, the patients may not be able to accept their physical changes and have the senses of loss and sadness. They may refuse the condition and do not admit that they are ill. These may contribute to non-compliance with treatment (Krervanichkij, 1988). The patients, therefore, are at risks of readmission for medical treatment (Sullivan et al., 2002).

For patients whose illness has reached to the final stage, i.e. Class IV or Stage D of heart failure, the condition is likely to be incurable and the patients have little hope of recovery as they constantly suffer from dyspnea. Some patients may have frequent recurrences of symptoms or have experiences of severe or critical condition; thus they are worried and continually fear of sudden death. The patients may be concerned that they may not receive medical help in time. These feelings strongly have impact on the sense of security as the patients feel uncertain about their lives thus, feeling stressed and depressed.

Patients who have depression in addition to other illnesses can develop into severe medical illness and may have severe functional impairments (Ekman, Fagerberg, & Lundman, 2002). The patients suffer from their illness because of the reduction in cardiac efficiency. When they have to perform activities requiring cardiac output beyond their cardiac capacity, dyspnea, palpitation, and edema may develop. As the patients recognize the heart as the most vital organ and frequent exacerbations contribute to restrictions of physical activities, they become depressed and afraid of being incompetent and dead when the heart failure progresses with aggravating

symptoms. The patients may then refuse the reality and become obstinate to the extent that they do not comply with medical treatment plan, causing difficulties in illness control and prevention of recurrence.

Some patients need close care in hospitals or clinics as they are at constant risk of volume excess. Patients who need medical equipments to support cardiac function continuously and have limitations for physical activities or have to be bed-ridden may feel powerless and unable to control their lives (Mahoney & Mathews, 2001). Consequently, these patients have the feelings of self-worthlessness, despair, and low self-esteem. Some patients may become demanding, irritable, angry, self-centered, depressed, or isolated. It is found that patients at this stage of heart failure are likely to have severer depression (Skala, Freedland, & Carney, 1995).

The prevalence of depression in patients of Class I of functional classification, or Stage B of heart failure, is found at 8%; whereas among patients with the functional Class IV or Stage D of heart failure, the prevalence of depression is as high as 40% (Freedland et al., 2003). Patients with severe symptoms are also at higher risk of depression, as the aggravating symptoms lead to lack of motivation and willpower for self-care thus worsening illness progress (Friedman & Griffin, 2002). The rate of hospital re-admission is found to be higher (Van der Wal et al., 2005). Finally, mortality rate is increased (Bennett et al., 2003; Freedland et al., 2003; Jiang et al., 2001; Moser & Steveson, 2001; Riegel et al., 2002).

2. Adaptation of patients with heart failure

2.1 Roy's adaptation model

Roy's adaptation model is based on the belief that a person is a biopsychosocial being. And the constituents function in unity and are inseparable in human beings. A human being has a large system consisting of subsystems that coordinate and relate to each other. If a subsystem is disturbed or affected by any causes, the disturbance has impact on the whole system. A person is an open system that constantly interacts with both internal and external environments (Andrews & Roy, 1999). Patients need to adapt or respond to the stimuli in order to maintain balanced condition. Those who can adapt, have stability in their lives, i.e. being healthy (Andrews & Roy, 1991a). They also accept reality, and they are satisfied with

their lives. On the other hand, patients who cannot adapt or have adaptation failure faces health problems, not accept reality, and become depressed.

A person's adaptation system consists of input, control process, effectors, output, and feedback mechanism, as shown in Figure 2.

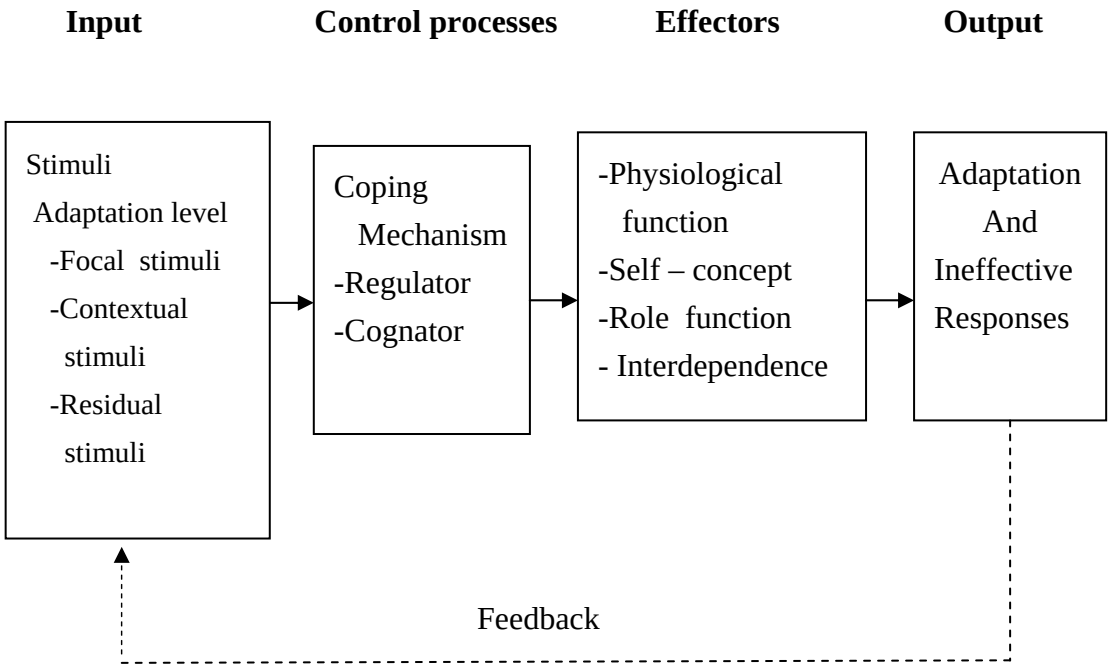

Figure 2 Adaptation system

Source: Introduction to nursing: An adaptation model (Roy, 1984)

A person's adaptation is the reaction to the input, which may be internal or external stimuli inducing behavioral response. Adaptation is one's ability to appropriately cope and manage the changed environment (Andrews & Roy, 1999). It is an outcome of response to stimuli, which can be divided into three types as follows:

1. Focal stimuli - the stimuli that directly confront the person and are presently important or threatening, thus requiring one's adaptation.

2. Contextual stimuli are other stimuli that coexist with focal stimuli and also induce adaptation.

3. Residual stimuli are the stimuli that may relate or connect to the causes of adaptation; for example, belief, attitude, habits, prior experience, value, and lifestyle.

These stimuli may relate to or may have effect on the outcome but they may be indistinct for the assessment.

When the input or stimuli enter a person's system, which is an open system, they stimulate the patients' response for the maintenance of balanced being. Therefore, a patient's system has mechanism for adaptation to both internal and external stimuli called coping process or control process. Coping process is a patient's reaction to changed environment, which may be developed internally or from the person's learning. It is composed of two mechanisms as follows:

1. Regulator mechanism, a key mechanism for adaptation. This mechanically automatically functions as a person subconsciously has physical adjustment through the co-function of neural system, chemical system and endocrine system with the coordination of receptive and responsive processes in order to maintain normal function of body systems. External and internal stimuli may enter the body through blood circulation or through receptive sensory to the central nervous system, spinal nerves, brainstem, and reflexes. Nerve impulses are transmitted to all related organs, stimulating autonomic responses. The impulses also have effects on endocrine function, causing hormonal releases affecting the organs corresponding to the mechanism.

2. Cognator mechanism. This mechanism is reaction of both external and internal stimuli like regulator mechanism; however, it is related to emotion and thinking process and mostly involves psychosocial adaptation with a few involvements in physical adaptation. When people are confronted with stimuli, either external or internal, they go through process of perception, learning, decision making, and emotional response. This process helps people in making choices to remember only things of their interest, imitating, and developing awareness concerning that particular subject. The people also make decisions to seek ways for problem-solving and to apply psychological approach in order to improve their feelings.

Regulator and cognator mechanisms are related to each other and always coexist, either in physical, psychological or social adaptation, for the sake of balance of human basic requirements and life stability. These two mechanisms function invisibly. However, their functions are expressed in adaptation behavior, which is an outcome of the reactions of these two mechanisms to the stimuli. The adaptation

behavior is expressed in 4 modes. They are as follows:

1. Physiologic mode. The adaptation behavior in physiologic mode is the behavior in response to basic primary needs for physiological integrity. The basic primary needs are oxygenation, nutrition, elimination, activity and rest, and control of body temperature. The needs also include complex process such as sensory control, fluid-electrolyte balance, acid-base balance, neurologic function, and endocrine function. The adaptation is required in order to maintain well-being or balanced condition. A human adjusts to stabilize life integrity.

2. Self-concept Mode. The adaptation in self-concept mode is to maintain psychic and spiritual integrity, which is concerned with opinion toward one's self. It involves self assessment in every aspect such as figure, appearance, ability, attitude, belief, opinion, thoughts, feeling and background. Self-perception has direct influence on one's personality, behavior, and performance. Self-concept is not congenital but it is developed from personal interaction with the close people, such as family members. Family is the first social unit that brings a person up to have interaction with other people and to perceive opinion of other people. Experience from social feedback raises the person's self awareness and his or her self-concept constantly changes. The person may adjust towards positive direction; for example, having higher self-esteem, being more open, being aware of self-worth, and adaptable to all circumstances. On the contrary, some people may have adaptation failure in self-concept mode. For instance, they may lack self-esteem, become sensitive, feel worried, have inferiority complex and sense of self-worthlessness. Adaptation problems in this mode depend on the people's reaction to certain situations. Self-concept is divided into two parts, as follows:

2.1 Physical self refers to one's opinion toward his or her body, such as body figure, appearance, look, beauty, organ efficiency, health condition, and sexual competence. Perceived self-appearance is influential to people' behavior and expressions. Any causes of negative changes in a person's body and appearance may be unacceptable to a person, thus leading to the sense of loss and distress. The responsive behavior of each person differs, depending on personal value and the meaning given to such loss.

2.2 Personal self refers to all feelings and opinions that constitute a person's personality. It is divided into the following components:

2.2.1 Self-consistency is people's consistency in behavior performance or adjustment in certain circumstances with the belief in good outcome of that behavior. People learn to adapt from prior experience and their performance is individually unique, depending on feelings, attitude, and belief that constitute their personality. When people feel under threat in any circumstances, they get develop the senses of uncertainty, worry, and insecurity. These feelings lead to adaptation.

2.2.2 Self-ideal or expectation is people's aim or expectation that is the basis of their performance to achieve the desired goal. People who are not successful in meeting the expectation and cannot adapt develop the sense of powerlessness in controlling their life. The failure leads to senses of low self-esteem, despair, and loss of interest in their life.

2.2.3 Moral-ethical self refers to people's moral and ethics that they use as criteria for consideration or making judgment on people's action. People's decisions on good or bad, right or wrong, and fair or unfair are influenced by their upbringing, tradition, culture, social value and religious belief. When people feel that they violate rules and regulation or their moral and ethical norm, they feel guilty and criticize themselves or blame it on other people.

2.2.4 Self-esteem is related to the aforementioned domains of self-concept, i.e. physical self, self-consistency, self-ideal and moral-ethical self. People with good development of these constituents have well perceived self-esteem. On the contrary, people who are highly worried feel threatened, thus having sense of suspicion, low spirit, loss or guilty, and powerlessness. These feelings lead to low self-esteem, which contribute to the development of inferiority complex, lack of self-confidence, pessimism, mistrust, demanding behavior, irritability, selfishness and social withdrawal in some case.

3. Role function mode. People need to adapt in their role function to maintain social integrity. One's well-being and normal living depends on interpersonal interactions and acceptance from other people (Andrews & Roy, 1991a). Therefore, people have to perform and adapt to their role function appropriately according to social expectation. Role function is defined in three aspects (Andrews & Roy, 1991).

They are as follows:

3.1.1 Primary role refers to the role according to gender, age, and developmental stage. This role determines appropriate behavior of the people at certain age during their lifetime.

3.1.2 Secondary role refers to the role according to one's development in life and occupation. For example, the family role such as father-mother or husband-wife; or occupational role such as teacher, doctor, nurse, etc.

3.1.3 Tertiary role refers to a person's temporary role such as patients, club members, etc.

Role performance is considered appropriate when the people's behavior meet social expectations. They should also have positive attitude towards their roles. Problems of poor adaptation in role function mode can be categorized into 4 types. They are as follows:

1. Ineffective role transition. People may have positive attitude towards their roles but they cannot perform the role effectively due to lack of role model and/ or lack of knowledge and understanding about that role.

2. Role distance. People may appropriately perform their roles with accurate expressive behavior and good attitude toward the roles; however, their roles performance is contradicted to or may cover their real feelings.

3. Role conflict. People may not be able to perform several roles at the same time. They may have conflict over their expectations, or intra-role conflict; or they may have conflicts over other people's expectations, or inter-role conflict.

4. Role failure. People with role failure are those who can not perform their roles at all.

4. Interdependence Mode. People living together are naturally interdependent, as they need close and loving people for support and help, either through giving love, respect, praise or honor to each other (Andrews & Roy, 1991a). A married couple should willingly have reciprocal relationship.

For a sound social life, two factors are required (Andrew & Roy, 1991). They are detailed below:

1. Significant other refers to the person who is perceived as the most important or most meaningful to one's life. The significant other is usually person who is closely

related and bonded with each other. They have mutual love and care with concerns and best wishes, for having been through good and bad times together; for instance, the relationship of father, mother, and children, or husband and wife.

2. Supporting system refers to people or things that are connected or related to one's life. It is similar to significant other but the relationship is not so close. Supporting system may develop from relationship with relatives, friends, and colleagues; or it may come from participation with clubs, associations, or organizations.

Poor adaptation in living together leads to imbalance or problems which could be expressed in two ways: dysfunction dependence and dysfunction independence. Both types may cause problems and harm to one's self.

2.2 Adaptation of patients with heart failure according to Roy's Adaptation Model

Illness with heart failure is an internal stimulus that induces body responses that lead to changes in body, daily living, work, and social and family life. Patients with heart failure need to undergo various procedures to maintain physical, psychological and social stability, thus they need to have adaptations. The detail is given below:

2.2.1 Adaptation in physical self mode of patients with heart failure

Most physical problems result from the pathogenic condition of heart disorder. Severe development of the disease may result from adaptation failure, leading to heart failure and recurrences of symptoms until the condition is chronic and incurable. The treatment is supportive or symptomatic treatment in combination with patient's adaptation or modification of behavior to suit the progress of illness. Adaptation is a significant problem of patients with heart failure (Cline, Bjorck-Linne, Israelsso, Willenheimer, & Erhardt, 1999). It is the response of the patients to environmental stimuli (Andrews & Roy, 1991).

Patients in Stage A of heart failure do not have symptoms of illness because there is no change in cardiac structure and function; thus they may not adapt to heart failure. When the condition develops to structural and functional heart disease, Stage B or Class I of heart failure, the left ventricle is enlarged (LVH) and / or causing

impaired function. Cardiac disorders are focal stimuli that involuntarily induce autonomic mechanism, which is a constant cooperation of neuro-chemical endocrine channels to make compensations for the balance of body system. If the compensatory mechanism is effective, the patients do not have symptoms of heart failure. Patients at this stage of illness have to control and reduce risk factors to inhibit or decelerate the progress of illness for improving survival. They receive heart medications for their conditions. In addition to adaptation for best results of the medication, the patients also need to adjust and follow medical advice in various domains, e.g. observation of medication side effects and fluid imbalance that could occur at anytime. Patients with functional impaired of heart failure are more in need to adapt to the increasingly impaired heart function (Nagy & Wolfe, 1984).

Patients who have physical adaptation failure present with symptoms of heart failure, or having heart failure Stage C or Class II and class III; for example, dyspnea, shortness of breath, cough, insomnia, loss of appetite, reduced urination, water intoxication, and edema. These symptoms usually coexist with complications in other systems. Increased failure of compensatory mechanism leads to frequent recurrences of illness. The treatment at this stage is focused on treatment of cardiac structural disorders and on prevention of illness progress, as well as reduction of heart failure symptoms for increasing survival rate. Patients receive several medications or may be treated with ventricular pacing or implantable defibrillators. They may also undergo other medicals inventions. These patients, therefore, are at risk of various side effects that may lead to cardiac dysfunction and even to death and the adaptation is more difficult at this stage. Any physical activity or exertion may lead to exacerbation of symptoms, but the symptoms are subsided after rest. The patients can take care of themselves but they need to adapt to their cardiac capacity and their conditions; for instance, restriction of sodium intake to 2 – 3 gram per day, having cardiac rehabilitation and exercise training, etc. It is found that patients with heart failure Class II and Class III cannot perform activities of daily living as usual and have difficulties with high-intensity activities, thus they lose confidence in their daily living and tend to have decreased adaptation (Thitapura, 1993).

Patients with heart failure Stage D are in severe condition and need to be under constant care and treatment with medications and medical equipments, thus the

adaptation is not noticeable even though the patients may have adaptation failure. It is found that preoperative patients receiving open-heart surgery and who have cardiac efficiency Class IV, or heart failure Stage D, cannot adapt to the illness and have complications, leading to severe symptoms and aggravating progress of illness (Srisuwattanasakul, 1988).

2.2.2 Adaptation in self-concept mode of patients with heart failure

Adaptation in self-concept mode is the adaptation of mental and spiritual state (Andrews, 1991b; Andrews & Roy, 1991a; Andrews & Roy, 1999). It depends on people's beliefs and feelings that contribute to their perception of external and internal stimuli, which constantly change. The heart is a vital organ and its disorder has strong impact on other organs of the body, thus heart illness induces the sense of meaningful loss to one's life. Self perception is an internal residual stimulus that has effects on people's adaptation behavior for the maintenance of mental stability. Self-concept constantly changes. Patients with heart failure who do not suffer from the symptoms, i.e. patients with heart failure Stage B or Class I, receive treatment for risk control and they have lifestyle modification. They may not have problems in physical and psychological adaptation as they can accept the conditions, perceive risk and severity of the illness, perceive benefits of treatment and perceive barriers of treatment thus having good compliance with medical care (Krervanichkij, 1988; Phasunan, 1986).

However, at stage C or Class III of heart failure when cardiac and body function has worsened with increasingly impaired cardiac function and disorder, the use of medications and other medical inventions is subsequently increased (Gottlieb et al., 2002; Krum, 2003). The treatment may yield good outcome as the pathogenic condition of the heart is not so severe. Nevertheless, the patients may have dyspnea on exertion and they have limitations in performing physical activities. They have to adjust to prevent recurrences of heart failure. These patients are also aware that the illness is incurable. If they cannot accept the changes from this illness, they have the sense of powerlessness and decreased adaptation in self-concept mode (Pattananimarn, 1989). Patients who have experience of frequent recurrences of symptoms are worried and stressed. They become pessimist, demanding, irritable, and self-centered. Hospitalized elderly patients with poor perceived knowledge and understanding about

the illness particularly demonstrate poor psychological adaptation (Pomsemapithal, 1993).

When the illness becomes severer, as in heart failure Stage D or Class IV, the patients feel constant risk of critical condition and mortality. They are not able to care for themselves and suffer from the illness and physical restrictions. The patients are not able to improve their restricted lifestyle. They may blame it on fate or blame themselves, feel inferior, and have the sense of self-worthlessness. When having exacerbations of symptoms, the patients feel despaired and dispirited. They should be dependent on life-saving equipments and on their family. These conditions induce worries and stress; and the patients have strong reactions to pain and feel unconfident in their livings, leading to failure in psychological adaptation (Chuenjairuang, 1993).

2.2.3 Adaptation in role function mode of patients with heart failure

Patients' adaptation in role function mode for the maintenance of stability and normal living in the society is dependent on their personal interactions with other people according to their social role, either primary, secondary or tertiary role, which they presently hold and are expected to perform (Andrews & Roy, 1991a). Patients who are at risk of heart failure, or those with heart failure Stage A, do not have symptoms and can perform their roles effectively. Patients, whose illness develops to cardiac disorder, i.e. heart failure Stage B, can also perform their roles function. Even post-operative patients who have undergone a surgery for valve replacement can resume their previous works although they may not be able to perform to the full potential due to the fear of symptom's exacerbations from exertions. Nevertheless, some patients may have to go back to labor work that is not suitable for their restricted condition, such as construction workers or laborers. Some patients feel that they do not receive important assignment or work requiring high responsibility from their colleagues or their boss because of their lack of potentialities and strength (Laohawiriyakul, 1988).

When the condition develops to heart disorders of Stage C, or Class II and III, the patients have chronic illness which causes recurrences of symptoms. They then have to take a leave or resign from their works and may have to refrain from some exercises or recreational activities that they use to do. It is found that many patients

with myocardial infarction have to change their jobs or leave their personal businesses to avoid the risk of aggravating myocardial infarction (Vongsvivut, 1993). It is also found that patients with atherosclerosis who have regular job tend to work less or change to trading or setting personal businesses after having the illness (Pariyawatee, 1999).

Patients who have experience of heart failure such as having symptoms on exertion need help and care from the family and close people. As their conditions get worse, they have exacerbation more easily while having activities and they become less able to care for themselves; thus these patients are burden on their caregivers, causing impacts on life of family members who may get stressed from caring for the patients (Sareewiwatthana, Ponnuangma, & Tosuksiri, 1997). Some patients may not be able to perform their roles as husbands or wives as they lose confidence in their physical capacity and do not dare to have sexual activity as usual due to the fear of threat to their lives (Sinthu, 1983). Some patients may stop having sexual activities (Vongsvivat, 1993). It is found that 50% of patients with heart disease have sexual problems with their spouses due to the change in their sexual relation (Sinthu, 1983). When the illness reaches final stage, Stage D or Class IV of heart failure, the patients have to resign from their works and have less social life. They become fully dependent on other people. Consequently, they have the sense of loss, guilt, and frustration, followed by having role conflicts. These feelings may disturb their regular works and their social lives, as the patients may withdraw from the society; finally, they have adaptation problems (Laohawiriyakul, 1988).

2.2.4 Adaptation in interdependence mode of patients with heart failure

Adaptation in interdependence mode results from close interpersonal relationship with mutual giving and taking in various aspects, including love, respect, admiration, and honor (Andrews & Roy, 1991a). Patients at risk of heart failure, or at Stage A of the illness, do not have symptoms; thus they do not depend on other people. When cardiac disorder develops to Stage B or class I, the body starts having compensatory mechanisms but the patients can still take care of themselves like general people and ask for help only when necessary, thus not feeling like they need to be cared for. Patients with structural and functional disorders of the heart, or Stage C

or Class II and III of heart failure, have experiences and symptoms of heart failure. They can care for themselves at certain level, such as in performing activities of daily living, but they suffer from dyspnea on exertion and need a rest to get over the symptoms. Patients with heart failure Class II who understand their health conditions and take appropriate self-care in activity performance have effective adaptation (Chuenjairuang, 1993). At the Stage D of heart failure, however, the patients suffer from frequent exacerbations and get tired easily, thus they are burdens on other people. They mostly rely on significant others, i.e. family members such as offspring or spouse, father or mother, sibling, and relatives. These people help caring for the patients according to the medical care plan with concerns, sympathy, and empathy (Panidchakul, 1993). Some patients may become too dependent whereas some may be too considerate and try to help themselves too much to the extent of being harmful in their present conditions.

2.3 Some factors related to the adaptation of patients with heart failure

In addition to the aforementioned adaptation modes, patients' environments, either external or internal, are also associated with their development and behavior. The environments that have effect on one's adaptation, or contextual stimuli, are discussed below.

2.3.1 Gender

Gender is an attribute that defines a person's sexual role and appropriate behavior through social cultivation. Men and women, therefore, are different in behaviors, roles, life expectations, intellectual and emotional developments, and emotional expressions. Gender is an influential factor to one's problem-solving approach. Females tend to use psychological mechanism by talking to relieve the feeling of distress. They differ from males, whose social role is dominant as earners, leaders, and decision makers, as well as having strength (Jirawatkul, 2003). Male patients who cannot perform physical or their usual recreational activities feel insecure and have negative moods more than female patients. Patients with chronic hypoxemia and long-term insufficient blood supply in various body parts develop the symptoms that interrupt their self-care performance such as fatigue, exhaustion, lack of energy, and discomfort. Female patients, whose role involves household

responsibilities, usually have to do housework and care for family members despite their advancing age and illness. The housework activities are likely to cause fatigue and aggravating symptoms in female patients with more severity than the effect on men (Evangelista et al., 2001). It is also found that male patients tend to have better adaptation in the performance of intermediate activities of daily living, self-care and general health, vigor, and social participation, as well as having better quality of life than female patients (Riedinger et al., 2001).

2.3.2 Age

Age is an internal contextual stimulus that reacts to the environment related to past experience affecting one's adaptation to present condition. People at different ages have different responses to stress, different coping and adaptation mechanisms. These mechanisms are internal interactions through the process of thinking, decision-making, and giving meaning to various circumstances. Illness with heart failure is more complicated in people at advanced age as the compensatory mechanisms may be difficult for the body, thus the symptoms can easily worsen. Heart failure tends to affect people at old age who have limitations in performing physical activities, as well as feeling of discomfort. Therefore, the patients can hardly care for themselves, feel worried and uncertain about their illnesses. Patients who cannot conduct self-care may refuse help and not comply with medical treatment (Sankthong, 1997).

2.3.3 Marital status

People living together are naturally interdependent so that they can have proper social lives. Patients' significant others are usually their husbands or wives who can respond to their needs with empathy and profound bonding. Married couple should be both giver and taker with willingness (Andrews & Roy 1986). Support from spouse is a significant contextual stimulus, as it encourages the patients to effectively follow the medical care plan so that the severity of illness could subside. According to a study, patients with valvular disease who are married receive mental support as their spouse accept their unhealthy conditions and express concerns when they experience exacerbations of symptoms. Consequently, the patients are interested in their conditions and regularly take care of themselves. They attend every follow-up appointment and have hope of improving condition. Moreover, these patients do not

feel like they are a burden to other people or constantly dependent on the family, as they still have their roles as family leader and adviser, in addition to being loved by family members. The patients, therefore, feet confident in their roles despite the illness as they are not affected by any role transition; and, as a result, can make appropriate adaptation to their conditions (Thitapura, 1993). On the contrary, married patients who receive little emotional support from their spouses, as the spouses do not express concerns or worries about their illness and are unwilling to help but leaving them alone, are likely to have psychological problems and are not ready to cope with any changes. Consequently, these patients have inappropriate adaptation (Panidchakul, 1993). For patients with heart failure who are single, they tend to have problems adjusting to medical care and monitoring of volume excess (Ni, Burgess, Wise, Crispell, & Hershberger, 1999). They also have problems in the restriction of sodium in their diet and fluid intake and are not interested in complying with continuous treatment (Artinian, Magnan, Sloon, & Lange, 2002).

2.3.4 Education level

Education is a factor determining one's ability for problem solving. Patients with high level of education tend to comply with medical plan in order to control their conditions with understanding about the progress of illness. When these patients are ill, they seek information, learn, and try to understand the cause of disease so that they can make appropriate decisions. It is found that patients with myocardial infarction who have low level of education demonstrate difficulties in understanding the causes of illness, treatment, and self practice (Panidchakul, 1993; Phasunan, 1986; Vongsvivut, 1993). These patients require a long period of time to understand the illness and they may need explanations from other people. They may choose right or wrong approaches according to their prior experience or suggestions of other people. Their practices may be harmful and induce aggravating symptoms. The patients may then ignore medical advice, and subsequently have adaptation problems, leading to poorer quality of life (Chai-aree, 1990).

2.3.5 Income

Patients with heart failure need medical treatment and care for prevention of complications for the rest of their lives. Despite the government health insurance policy, they still have expenses such as transportations and other medical

products. These expenses have impacts on family income, especially when the patients are key earners of the family. These patients may not be able to return to work as before and may have to change or resign from their jobs. Reduction in family income leads to stress and worries, which have negative effects on the patients' symptoms. It is found that patients with heart failure who have good economic status and steady income are not financially dependent on other people, either for personal or medical expenses. These patients, therefore, feel confident in answering to any basic need and can adapt to medical well (Krervanichkit, 1983; Panidchakul, 1993).

2.3.6 Duration of illness

Patients naturally need time for adaptation. When patients are informed about their illness of the heart, which is a vital organ, they refuse the illness due to mental conflict with the illness management and not having enough time to adjust to their changing conditions. Therefore, the patients may not comply with medical treatment at the beginning. Nevertheless, after a period of time, the patients learn to accept reality and gradually adapt to maintain their physical and mental stabilities. Heart failure is an incurable chronic condition. At the beginning of their knowledge of the illness, the patients use psychological mechanism for mental comfort by having emotional responses such as worries, fear, anger, depression, reject; and they may withdraw from accepting the illness. After receiving treatment and when the symptoms are under control, the patients start to comply with medical care plan (Chai-aree, 1990). However, the patients with shorter duration of illness demonstrate lower level of adaptation (Panidchakul, 1993).

2.3.7 Stage of heart failure

In 2001, ACC and AHA created a conceptual framework to help health care providers understand the continuum of disease progression in heart failure. The framework defines disease progression in four stages: A, B, C, and D, beginning with patients who have risk factors for developing heart failure all the way to patients with end-stage disease. The ACC/AHA guidelines were updated in 2005, reflecting a refined evidence base for treating chronic heart failure. The stages differ from the NYHA classification, since the latter describe patient symptoms and limitations in functional status. Incongruous as it may seem, stages A and B of new stage-based scheme don't include severe or symptomatic heart failure but who are at risk for

developing heart failure. For example, patients with coronary artery disease, hypertension, or diabetes mellitus who do not demonstrate impaired left ventricular (LV) function, hypertrophy, or geometric chamber distortion is considered Stage A. Whereas patients who are asymptomatic but demonstrate left ventricular hypertrophy (LVH) and /or impaired LV function is designated as Stage B. Stage C then denotes patients with current or past symptoms of heart failure associated with underlying structural heart disease, and stage D designates patients with truly refractory heart failure who might be eligible for specialized, advanced treatment strategies such as mechanical circulatory support, procedures to facilitated fluid removal, continuous inotropic infusion, or cardiac transplantation, or other innovative or experimental surgical procedures, or for end-of-life care, such as hospice.

According to Roy's adaptation model, stage of heart failure is one of the focal stimuli from internal environment. The above classification is aimed to identify risk factors contributing to heart failure so that patients in each stage receive appropriate treatment and the progression of illness is prevented before the occurrence of left ventricular dysfunction (LVD). Nevertheless, there is not any study on the predictive power of stage of heart failure on patients' adaptation previously. Studies in patients with heart failure, however, report that severity of illness can predict the patients' self-care practice, as patients with severer symptoms demonstrate good adaptation regarding self-care and prevention of symptoms' recurrence (Rockwell & Riegel, 2001; Schwarz & Elman, 2003).

2.3.8 Depression

Concepts of depression

The outcomes of illness with heart failure are internal focal stimuli inducing the adaptation of autonomic control mechanism. The stimuli have impacts on physical adaptation and the perceptive mechanism that chooses and subsequently expresses the responses through psychological process. These mechanisms relate to each other and always co-function either in physical, mental, or social adaptation. They integrate with the function of individual system as a whole and are inseparable. Any change will lead to an appropriate response to maintain the stability of one's life (Andrew & Roy, 1991a). Heart failure is a chronic condition with frequent exacerbations thus it has strong impact on one's thinking, mentality, and feeling,

causing distresse, stress, and depression. (De Geest et al., 2003; Pratt et al., 1996). These negative feelings aggravate the symptoms and vice versa, thus being a vicious cycle in a way. Elderly patients, who already have physical and psychological deterioration, may become too dispirited to conduct health care practice. Depression commonly occurs in patients with chronic illness. People with mild depression present with sadness, sorrow, and despair but they can live normal life. However, if patients cannot adapt themselves or do not receive proper treatment, the symptoms become severer and the patients feel helpless, worthless, pessimistic and have withdrawal behavior. Depression frequently occurs when people are ill or hospitalized. If the patients have depression for longer than two weeks, the condition may develop to depressive illness (American Psychiatric Association, 2000).

Definitions of depression

Depression is defined with various meanings, they are given below:

Depression is the condition of which a person expresses the moods and feelings of loneliness, boredom, despair, discouragement, and helplessness. These emotions may occur occasionally with anybody for a brief period or may occur when a person is confronted with a tragic incident involving loss. It is a natural condition that anyone may experience in a life time and the condition does not always reflect mental disorders. Depression is considered as emotional disorder when the presence of negative feelings, such as feeling bored, discouraged and dispirited, is longer than two weeks and get worse as time passes. The negative moods then become so severe to the extent of behavioral disorders and the affected person demonstrates physical and psychological symptoms (Jirawatthanakul, 2003).

Depression refers to a person's psychological responses to critical or stressful situation that are expressed as deviations of emotion, thought and perception, including physical and behavioral disorders. The person with depression suffers from senses of distress, sadness, hopelessness, loneliness, worthlessness, despair, loss of appetite, insomnia, and negative view of self, the world and the future (Jantrapat, 2000).

Depression refers to the mental condition in which a person feels sad, depressed, dispirited, despaired, hopeless, pessimistic and guilty and has low self-esteem (Institute of Mental Health, Ministry of Public Health, 1993).

Depression is a syndrome of disorders in emotions, thoughts and understanding, as well as physical disorders (Kurlowicz, 1998).

Depression is a kind of feeling that is considered as a mental problem. It is present with symptoms of sadness, dispirit, loneliness, despair, and hopelessness (Beeber, 1998).

From the above definitions, the operational meaning of depression for this study is concluded as patients' emotions and feelings of disturbances that are expressed as sadness, distress, despair, hopelessness, negative view of self, the environment and the future, and low self-esteem. These feelings have negative effects on the patients' health and their participation in social activities.

Causes of depression

Researchers and academic have proposed various explanations and theories about the causes of depression. Common hypothesis can be divided into three major theories. They are reviewed below:

1. Biological theories of depression

1.1 Biochemical theory of depression. It is currently believed that depression is caused by disorders of biological substances in the brain that control neurotransmitters and the function of nervous system. It is found that these biochemical substances, including catecholamines such as acetylcholine, norepinephrine, serotonin, and dopamine, are reduced at the synaptic receptor in the brain (Delgado, 1992). The reduction of these substances is common in people at older age (Hagerty, 1995). Previous studies found evidences that metabolic disorder of neurochemical substances may cause depressive disorder, such as the incidence in patients with hypertension who received reserprine, which have effects reducing catecholamine and 5-th (a deviation of serotonin), in the brain. Studies of some patients with depression who also have complete deficiency of catecholamine (especially norepinephrine) at the synapse in the brain area controlling emotion or depressive disorder also found relation of receptor dysfunction. The receptor appears to have subsensitivity thus it seems like a deficiency of norepinephrine (Schildkraut, 1995). When the patients receive antidepressant, the concentration of norepinephrine and dopamine increases the concentration of norepinephrine and dopamine and it also enhances the effects of both substances that are released to the synaptic cleft to enter

the synaptic terminal, bringing the patients back to the normal condition (Satahl et al., 2004).

Patients with heart failure usually receive several medications. Some medication, such as propanolol (inderal), is fat-soluble thus it is easily absorbed into the brain and can inhibit noradrenaline and serotonin receptors. As a result, the serotonin neurotransmitter cannot function properly, causing depression. Drugs in nifedipine group (adalat) have a side effect as inhibitor of calcium metabolism, thus decreasing norepinephrine release, leading to depression (Tantipalacheva, 1995).

1.2 Neuroendocrinology theory of depression. Depression can coexist with illness involving disorders of several systems. Studies have shown that depression is related to the functioning of hypothalamic-pituitary-adrenal (HPA) axis activity (Sturat, 2001; Sylvalahti, 1994). This HPA axis activity controls a person's sleep, appetite, emotion and sexual desire (O'Toole & Johnson, 1997). Therefore, the disturbance or dysfunction of HPA leads to emotional disorders and physical symptoms such as weight loss, change in sexual desire, irregular menstruation, and sleep disorder (Sturat, 2001; Sylvalahti, 1994). It is found that HPA overwork stimulates the release of corticotrophin, cortisol, and prolactin into blood circulation and reduces the secretion of thyroid-stimulating-hormone (TSH), somatotropin, and lutinizing, causing decreased blood level of these hormones (O'Toole & Johnson, 1997; Sturat, 2001). Therefore, such effects can cause depression.

Heart failure is a chronic illness, which is a stressful condition that constantly has significant impact on the compensatory mechanism of the heart and the body. It also stimulates the sympathetic nervous system and peripheral nerves to release epinephrine and norepinephrine, which have major role in metabolic control and in enhancing cardiovascular function, leading to increased heart rate and blood pressure. Prolonged responses to epinephrine and epinephrine from the compensatory mechanism lead to disorder of coagulation system, causing accumulation of fibrins to the extent of plaque formation on vascular wall (Musselman et al., 1996). The plaque increases risk of vascular obstruction from floating plaque, which can be a cause of acute myocardial infarction, leading to heart failure (Masselman et al., 1996; Markovite & Matthews, 1991).

1.3 Genetic theory. Empirical data supports the theory of genetic cause of depression. It is found that there are impairments in genetic transferal from one generation to another in blood-related lineage (Kasantikul, 1986 khor). People whose family members have depression are at 2 - 3 times higher risk of the disorder than general people. In a family in which either father or mother has depression, the children are also at risk by 27%; however, if both parents have depression, the risk of depression in their children increases to 50 – 75% (Tsuang & Faraone, 1996). A study in monozygotic twins of which one of them has depression found that 46% of the other twin also have depression whereas the incidence in dizygous twin is only 20% (McGuffin, Kate, Watkine, & Rutherford, 1996).

A study on genes related to emotional disorders in the pedigree of patient's families with depression found that the gene related to depression is located on the 11th order of the X-chromosome (Paykel, 1991). Females are found to be at high risk of depression by 44% whereas males are at risk by only 24% (Bierut et al., 1999; Jansson et al., 2004; McGue & Christensen, 1997). A recent scientific study in gene promoter of serotonin neurotransmitter (5-HTT), which is located on the 17th chromosome in the synaptic area of the brain, found short (S) and long (L) genes; and the short (S) gene is related to the decrease in 5-HTT in patients with depression (Lesch, 2004). An experimental study in people experiencing stressful incidents in their lives found that short (S) gene is related to the release of serotoninnergic hormone in response to stress, which reduces the reabsorption of 5-HTT serotonin thus causing depression (Caspi et al., 2003).

2. Psychological theories of depression

2.1 Psychoanalytic theory. The theory of Sigmund Freud is a classic example of psychoanalysis. According to Freud theory depression results from the loss of or separation from the loved ones, significant objects, or loss of organ that affects self-image (Blazer, 1982). The people use introjections mechanism in response to their loss by concentrating on the pictures of the person or thing that they lose and using those pictures to form frustration in combination with their ego. The loss, disappointment, or separation leads to anger and hostility developed from the mental conflicts that people do not dare to express. These feelings cause mental disturbances, sense of guilt, and loss of self-pride. Some people may employ regression mechanism

by having childish manners such as being fussy, self-centered, afraid of being alone, and obsessive.

2.2 Cognitive theory. The idea of cognitive distortions as a cause of depression was proposed (Beck, 1967). People have cognitive distortions from negative views of self, world and future, which induce three types of thoughts comprising automatic thoughts, schemata or assumptions, and cognitive distortions. When people are confronted with threatening situations, they promptly have automatic thoughts as the first instant thoughts without premeditation. The automatic thoughts have effects on the schemata or assumptions on that situation, which may not be consistent with the reality. The negative thoughts may be so severe that they have impact on the people's emotions, behaviors, adaptations, and expressions; for example, magnification, unreal conclusion without clear evidence, and selective abstraction. The people may pay so much attention on some small matter that they forget to think about more important matter. Therefore, schemata form the complex structure of thinking process and are concerned with psychological components. Schemata in patients with depression can be divided into three types. They are as follows:

2.2.1 Negative view of self. Patients perceive themselves as worthless, incompetent, having no pride or having nothing. This perception is on account of the impairments that they feel despaired to fight against and the sense of helplessness. The patients interpret events in negative aspects and always blame themselves for anything wrong, thinking that it is their mistake. Thus they have the sense of low self-esteem which leads to depression.

2.2.2 Negative view of world. The people interpret their interaction with the environment on the basis of loss. They perceive only negative aspects of the society, feel pressured, and feel like they are much expected. The people then feel despaired and dispirited, thinking that life is full of obstacles and have low self-esteem. When they are confronted with any situation, they always have negative thoughts, enhancing negative automatic thoughts which lead to depression.

2.2.3 Negative view of future. This view is the perception of future as being full of difficulties and failure. The people think that present troubles will go on endlessly. They perceive that their future life will be harder and feel

despaired and hopeless about the future. As a consequence, they have depression, which may lead to suicidal attempt in order to escape from the expected problems or sufferings.

3. Social theory

The concept of social theory is similar to psychological concept. Social cause of depression involves the interaction between the person and the environment, which may life threatening incident that can contribute to the development of depression. For instance, the lack of close friends or close person, lack of trusted person, unemployment, loss of loved person, lack of social support. All these factors can lead to depression (Wade & Kendler, 2000).

Signs and symptoms

People with depression demonstrate the following signs and symptoms:

1. Mental symptoms

People with depression usually present with changes in their emotions, thoughts, intellectuality, and perceptions. They express negative emotions and feelings such as loneliness, dullness, boredom, despair, hopelessness, discouragement, lack of creativity, lack of concentration, indecision, lack of motivation, forgetfulness, hypochondria, fear, stress, excitement, sadness, anger, and irritability. The people also show no interest in close friends, feel unsatisfied with their present states, feel guilty and have low self-esteem. These emotions occur occasionally and the people recover in a brief period. People may also have depression when they are confronted with tragic events involving loss. Depression is a natural condition that may occur to anybody in a lifetime and it is not a disorder. Nevertheless, if a person is depressed for a long time with feelings such as boredom, sadness, and despair lasting for longer than two weeks and getting worse as time passes, the condition is too severe to be considered as a natural reaction to an incident. When the negative moods aggravate to the extent of having impact on natural normal living, the depressive feeling is identified as a disorder.

2. Physical symptoms

Most people with depression present with changes in their sleep, either too much or too little. Other symptoms include fatigue, sexual incompetence, changes in dietary habit, decreased or increased appetite, absent mindedness, forgetfulness,

quietness, lack of interest in usual hobbies or recreational activities, avoid meeting with people, and not going out. They may also have symptoms of chronic physical illness that is incurable or has no definite cause, such as headache, muscle pain, discomfort, flatulence, diarrhea, general pain in the body, palpitation and high blood pressure (Jirawatkul, 2003).

3. Social and behavioral symptoms.

People with depression present changes in their manners and interpersonal relations; for example, they are not cheerful as they used to be, or conduct fewer activities. These symptoms can be observed from manners and expressions such as indifference, disinterest in the environment, avoiding eye-contact, decrease in work responsibility, disorganization, irrational behavior, delusion, hallucination, lack of interpersonal communication, and social withdrawal.

Assessment of Depression

Instruments for the assessment of depression are developed according to definitions and causes of depression. The assessment can be divided into two types, as follows:

1. Assessment of depression by observation, comprising Hamilton Rating Scale for Depression (HRS-D) (Lotrakul, Sukanich, & Sukying, 1996).

2. Assessment of depression with interview questionnaire, comprising Beck Depression Inventory (BDI) (Lotrakul & Sukanich, 1999), Zung Self-Rating Depression Scale, Center for Epidemiologic Studies Depression Scale (CED-S) (Kuptniratsaikul & Pekuman, 1997), Geriatric Depression Scale (GDS) (Phuangwairin et al., 1994), and Health–Related Self-Report (HRSR) (Kasantikul et al., 1997).

The widely used instruments are listed in details below:

1. Hamilton Rating Scale for Depression (HRS-D). This instrument was developed in 1967 by Professor Hamilton, a British psychiatrist. It is used for the assessment of depression through the observation of the severity of symptom. HRS-D is commonly used in the evaluation of treatment outcome and in psychiatric research. The scale is composed of 17 items for the assessment of symptoms in psychological and physical domains, and in work efficiency. Each item has a scale for rating the severity of symptoms according to the observation or investigation of history. The first nine items have rating scales ranging from 0 to 4, and the following seven items have

rating scales with the range from 0 to 2. Psychiatrists who perform medical examination give the rating scores according to information from the interview with the patients and from other sources. The total scores higher than 13 are interpreted as good response to the treatment. This instrument was translated into Thai and the examination of instrument quality found high level of both validity and reliability (Lotrakul et al., 1996). The limitations of this instrument is that the examiners should be psychiatrists, clinical psychologists, or professionals who are well trained and experienced in psychology with expertise in observation and judgment of depressive symptoms.

2. Beck Depression Inventory (BDI). This instrument was developed in 1967 on the basis of cognitive-behavioral theory (Beck, 1967). It consists of 20 question items, inquiring about the state of emotions, thoughts, behavior, body system function, and activities. The BDI is a self-report inventory, asking the respondents to explore their lives and feelings in the past month. The scores for each item range from 0 to 3 for the following responses: 0 means not having such feeling or behavior at all; 1 means having such feeling or behavior sometimes but less than once a week; 2 means having such feeling or behavior quite frequently - about 2 -3 times a week; and 3 means having such feeling and behavior almost everyday. The results are interpreted as mild depression, moderate depression and severe depression. The BDI was translated into Thai and the Thai version demonstrated high level of validity and reliability (Lotrakul & Sukanich, 1999). The BDI is useful for making diagnosis of major depressive disorders according to the DSM-IV-TR criteria and it can identify the level of depression severity. However, these qualities do not correspond with the objectives of this study.

3. Zung Self-rating Depression Scale. This instrument was developed by Zung in 1965. It is a questionnaire for the assessment of depression in patients who are diagnosed with depression for the first time with no limitations regarding patients' age. The instrument is designed for the assessment of imbalances in emotion, body and nervous system that control the function of body and mind. It consists of 20 self-report questions, asking the respondents to explore their feelings in the past 2 – 3 days. Each item has rating scale ranging from 1 to 4 points. The scores for each item are 1, 2, 3, 4 representing having that feeling a little, having the feeling sometimes, having

the feeling quite often according to the patients' current assessment of their emotion. The results are interpreted as mild and severe depression depending on the presence of symptoms. This instrument has limitations as most questions are about changes occurring in the elderly thus the assessment may not be sufficiently accurate. Moreover, it does not have questions concerning social and behavioral aspects. Thus there is possibility of some errors in the results.

4. Health-Related Self-Report (HRSR). This instrument was designed for the screening of depression in Thailand by Duangjai Kasarntikul and associates (1997). Psychiatrists from five academic institutes gave this assessment form the name 'Health-Related Self-Report for screening depression in Thai people'. The instrument can be conveniently used and is suitable for Thai people. The result can be easily interpreted and the contents of the questionnaire are simple and easy to understand. It consists of 20 items, divided into vegetative, motivative, cognitive, and psychological symptoms with three items stating positive symptoms (i.e. feeling contented, positive expectation about the future, and self-worth). This self-report questionnaire asks the respondents to explore their feelings toward themselves in the past two weeks. The rating scale for each item ranges from 0 to 3, representing the following meaning: 0 means not having that feeling at all; 1 means having that feeling less than once a week; 2 means having that feeling 2 – 3 times a week; and 3 means having that feeling almost everyday. Results are interpreted as normal state, non-severe depression, and severe depression. The limitation of this instrument lies in sensitive questions, or questions that may rouse the respondents to hide their feelings thus it may not assess actual feelings of the respondents. However, the scores from classification of depression severity do not correspond with the objectives of this study.

5. Geriatric Depression Scale (GDS). This instrument was developed by Yesavage (1983) and was translated for the assessment of depression in Thai elderly by Niphon Puangwarin and associates (1994). It consists of 30 questions, asking the respondents about feelings toward themselves in the past week. The answer choices are "0" for yes and "1" for no. The questions inquire feelings concerning emotion, negative expectations, body movements, cognition, and isolation. The results are interpreted as normal, mild depression, moderate depression, and severe depression. The limitations of this instrument are in questions about physical changes due to old

age thus not reflecting depression from chronic illness. Moreover, the use of this instrument with the elderly who have hidden dementia may lead to false interpretation.

6. Center for Epidemiologic Studies Depression Scale (CED-S). This instrument was developed by Radloff (1977) and has been widely used in a number of studies. It is a self-report inventory for screening depression at early stage in people experiencing life problems. The CED-S is also commonly used for the assessment of patients who have depression following physical illness of various diseases (Hurwicz & Berkanovic, 1993; Romano, Turner & Jensen, 1992). It is also widely used with the elderly (Buran, 2005; Callahan & Wolinsky, 1994). This instrument is simple and convenient for practical uses. It is composed of questions examining various feelings and behavior, including depressed feeling, guilt and self-worthlessness, despair and helplessness, slow reaction, loss of appetite, and insomnia.

The CED-S was translated into Thai by Vorapongsathorn, Pandii, & Traimchaisri (1990). It also has been widely used to assess patients with variety of chronic illness such as patients with heart failure (Lessman-Leegte, Jaarsma, Sanderman, Linssen, & Valdhuisen, 2006), myocardial infraction (Bunran, 2005), visual impairment (Kasornsri, 2006), cancer (Reisine et al., 2005), ischemic heart disease (Jiang et al., 2003), coronary artery bypass surgery (Borowicz et al., 2002), Hypertension (Davidson, Jonas, Dixon, & Markovitz, 2000), and cerebrovascular disease and after stroke (Beekman et al., 1998; Ramasubbu, Robinson, Flint, Kosier, & Price, 1998; Steffens, Helms, Krishnan, & Burke, 1999). The respondents are questioned about their feelings in the past week. This instrument is appropriate for the screening of early depression in Thai people with the reliability as high as 0.9154 (Kuptniratsaikul & Pekuman, 1997). The CES-D is an instrument for assessing depression that is easy and convenient for practical use and requires little time to complete. This instrument is also used to assess cardiac patients such as in 2005, acute myocardial infarction patients aged 46 -65 years were tested and the reliability was found at 0.78 (Buran, 2005). Department of mental health, ministry of public health, Public health of Thailand, recommends this instrument to assess depression in Thai population. Therefore, it is suitable for patients with heart failure.

Relation between depression and adaptation of patients with heart failure

Depression may occur to general people, patients with psychotic disorders, and patients with chronic physical illness who lose physical abilities either permanently or temporarily. Patients with heart failure have chronic illness thus they are sensitive to the sense of loss, which is likely to have negative effects on their health or on the symptoms. The development of heart failure is complex and the patients may experience critical conditions at any time. Moreover, they have to adapt to the illness and may need to be dependent on other people. These changes have substantial impacts in physical, psychological and social aspects; therefore, patients with heart failure are at risk of depression more than general patients.

A study was conducted in 100 outpatients with heart failure at average age of 67 years who were diagnosed with heart failure for longer than three months, had left ventricular systolic dysfunction (EF < 40% by echocardiography), received diuretic drugs., did not receive implantable cardioverter defibrillations (ICDs) and did not have cerebral dementia. The result shows that depression is related to severity of heart failure Class II and III. The worse severity by NYHA classification leads to decreased capacity for activity performance, increased dyspnea, constant symptom changes, and ineffective adaptation mechanism. These conditions have psychological impact, inducing the sense of helplessness and loneliness. Thus it is more difficult for the patients to cope with the illness (Haworth et al., 2005). The patients then have decreased adaptation, thus the rates of illness recurrences and mortality increases (Jiang et al., 2001; Murberg, Tveteras, Aarsland, & Bru, 1999).

In addition, chronic decrease in cardiac output causes insufficient blood supply to the brain (Riegel et al., 2002). Patients at older age are likely to have cognitive impairments from the degeneration of brain cells, thus they may have impaired memory, feel disconcerted, and become confused. A study in hospitalized patients with heart failure who were older than 70 years found that the patients have impairments in hearing, sights, writing, and comprehension thus having problems in communications and information exchanges with health professionals (De Geest et al., 2003). Elderly patients also have problems in self-care practice regarding drug administration, as they misunderstand the dosage and the correct way to use drugs (Gamararian et al., 1999). Therefore, elderly patients can rely on or help themselves

less than usual in various domains. The decrease in self-care ability have psychological impacts, causing the sense of despair, hopelessness, fear, uncertainty, instability, low self-esteem, lack of mental spirit to perform self-care, and negative expectations (Sauve, Blankenbiller, Lewis, & Bennett, 2002). The patients then easily have depression (Nakhapong, 1996) and have decreased adaptation.

Depression is an obstacle to patients' performance of activities of daily living. The patients are also confronted with uncertainty and negative changes of the condition. They also experience failure in role and function performance, lose their participation in family decision or lose their role as family leader, leading to the sense of powerlessness and self-worthlessness; thus the adaptation is affected (Thitapura, 1993). Nevertheless, patients who can follow medical advice and can regularly attend follow-up visits are more likely to have will power to comply with the treatment in order to recover from the illness (Panidchakul, 1993). The patients feel encouraged to comply with medical advice and to have rehabilitation practice. They do not feel tired thus being able to have more exercise without feeling bored or stressed. It is found that good physical function is related to reduced depression (Buran, 2005).

3. Summary

Heart failure is a complex condition that has substantial impacts in physical, psychological and social aspects of people. The Roy's Adaptation Model (1984) is applied to explain the impacts of illness. The input or focal stimuli is the stage of heart failure, which has direct effect on patients' adaptation. Contextual stimuli comprise gender, age, marital status, education level, income, duration of illness, and depression may also have effect on patients' adaptation. When the body receives these stimuli, it responds with coping mechanism through regulator and cognator processes, which automatically collaborate to maintain body balance. The adaptation is then expressed in four modes: physiological function, self-concept, role function, and interdependence. This mechanism functions continuously in cycle. Heart failure is a chronic and incurable illness, thus the patients have to adapt to constant stimuli. When the symptoms worsen and the adaptation is unsuccessful, the stimuli have stronger effect on the symptoms. As the symptoms get worse, the adaptation is more difficult. The patients and their families feel distressed in dealing with the illness, causing

substantial physical, psychological and social impacts. The review of related literature raises awareness and understanding about factors influential to patients' adaptation. The obtained information can be used to enhance patients' adaptation so that they can live their lives in accordance with the progress of illness and can control the stimuli effectively.

CHAPTER III
METHODOLOGY

Research Design

The descriptive study was aimed to examine the factors influencing adaptation in heart failure patients. The conceptual framework of this study was based on Roy's Adaptation Model. The research methodology, instrumentation and statistical analysis of data are discussed in this chapter.

Population and sample of the study

The population of this study was patients receiving medical care at the outpatient department, Chest Disease Institute, Nonthaburi Province. The samples were both male and female; they had been diagnosed stage B and stage C of heart failure.

Inclusion criteria

Patients with heart failure who had the following characteristics were selected for this study:

1. Aged 18 years old and older
2. Diagnosed heart failure of stage B or stage C by the following criteria:

2.1 Stage B of heart failure: the result of echocardiogram indicate one of the following conditions: left ventricular hypertrophy, Left ventricular hypokinesia, positive regional wall motion abnormality (RWMA), ventricular dysfunction (EF < 40%), valvular heart disease.

2.2 Stage C heart failure: Patients have current or prior signs and symptoms of heart failure.

3. Willing to participate in this study and informed consent to participate in the study

4. Readable, writable, no hearing problem, and no visual impairment

Exclusion criteria

1. Diagnosed of psychiatric illness or neurotic disorders
2. Being severe heart failure; as class IV of NYHA or stage D; severe complication such as acute pulmonary edema, shock, and crisis.

Sample size

The sample of this study was composed of 109 patients, as calculated using power analysis for predictability of multiple regression statistical analysis. (Polit & Beck, 2004). Power analysis was determined at medium effect size for correlation descriptive research of heart failure patients (Boonteang, 2002). There were eight independent variables; therefore, it is estimated a moderate effect size ($R^2 = .13$) that achieved a power analysis of .80, and reliability value at $\alpha = .05$. The following formula is applied:

$$\gamma = \frac{R^2}{1 - R^2}$$

Thus:

$$\gamma = \frac{.13}{1-.13}$$

$$= .149$$

Where γ = Estimated Effect size

N = Estimated number of subjects needed

L = tabled value for the desired α (.05) and power (.80) to be 15.02

K = number of predictors (8 variables)

Thus:

$$N = \frac{L}{\gamma} + K+1$$

$$N = \frac{15.02}{.149} + 8 + 1$$

$$= 109.8$$

Thus, 109 subjects were collected in this study.

Setting

This study was conducted at the outpatient department of the Chest Disease Institute, Nonthaburi Provice. It is government hospital under public health ministry of Thailand. The institute is a tertiary care centre of 300 beds for heart and lung disease patients. The service of outpatient department is on Monday to Friday at 09:00 - 12:00 A.M. There are five doctor-service rooms for heart disease patients. According to the report of the institute, there are approximately 4,260, and 7,398 patients in the year 2000 and 2005, respectively. In the year 2006, there are approximately 300 patients per day attended the heart clinic. Routinely, the patients are devided into two groups:

1. Follow up

1.1 Follow up without blood test patients

1.2 Follow up with blood test patients

All of the patients needed to register prior to be records vitals sign and body weight at 08.00 A.M. Then, they wait for doctor services which begin at 09.00 A.M. for the follow up without blood test patients, and 10.30 A.M. for the follow up with blood test group.

2. Walk in or new cases; after registering, vital signs and body weight are recorded. Doctor service will be provide next to the follow up group.

Medical prescriptions and next appointment are offered from doctor service. Waiting time for medicine at pharmacy center nearby is about 30-40 minutes.

Research Instruments

The instrument used in this study consists of three questionnaires as follows:

Part 1: Demographic characteristic questionnaires asking for information such as gender, age, marital status, income, educational level, duration of illness with heart failure, and stage of heart failure.

Part 2: The CES–D questionnaire developed by Radloff (1977) and translated into Thai by Kuptniratsaikul and Pekuman (1997) is used to evaluate depress of the sample. It is tested with myocardial infraction patients giving alpha coefficient of .78 (Buran, 2005). The questionnaire was composed of 20 items, divided into four domains of major depressive symptoms, as follows:

Depressed affect, consisting of 7 items; Item 3, 6, 9, 10, 14, 17, and 18.

Positive affect, consisting of 4 items; Item 4, 8, 12, and 16.

Somatic and retarded activity, consisting of 7 items; Item 1, 2, 5, 7, 11, 13, and 20.

Interpersonal relationship, consisting of 2 items; Item 15 and 19.

Each item is rated on scale of 0 to 3. The scale represented the possible response ranging from 0 (rarely or none of the time) to (most or all of the time), with a possible score range from 0 to 60.

For each of 20 items, respondents rated how often they experienced symptoms in the past week, from rarely or none of the time to most or all of the time. The level of frequency, the meaning, and the score of each level are as follow:

Level of frequency	frequency of the Feeling	Depressive score	
		Positive Statement	Negative Statement
Rarely or None of the time	Less than 1 days	0	3
Some or None of the time	1-2 days	1	2
Occasionally or Moderate amount of the time	3-4 days	2	1
Most or All of the time	5-7 days	3	0

Among the 20 items, there were both positive and negative statements, as listed below.

Sixteen negative statements were no. 1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19, and 20.

Four positive statements were no. 4, 8, 12, and 16.

The score of 20 items were summed to create a total score that ranges from 0 to 60. According to Wilai Kupniratisaikul and Panom Kateman (1997), a score between 0 to 18 is considered “not depressed”; score at or above 19 indicate depressive.

Part 3: Adaptation questionnaire, which was constructed by researcher. The questionnairs are developed and designed to include questions relevant to Roy’s adaptation model and literature review about heart failure. For each of 35 items, respondents rated how often they experienced behavioral in the past month. The questionnaire divided into the measurement of adaptation behavior in four domains:

2.1 Physical of adaptation behavior questionnaire. The questionnaire consisted of 14 items, is associated with the physical and chemical process involved in the function and activities of living organisms. They are identified in the physical relative to the basic need of physiological integrity: oxygenation, nutrition, elimination, activity and rest, fluid and electrolyte, and acid-base balance; neurological function; and endocrine function contribute to physiological adaptation.

The response for each statement are then given in a 4 level Likert scale format. Among the 14 items, there were positive statement and the scoring criteria were the following:

Level of frequency	frequency of the behavior	Adaptation score Positive Statement
Rarely or None of the time	Rarely or never perform	0
Some or None of the time	Sometime perform	1
Occasionally or Moderate amount of the time	Frequently perform	2
Most or All of the time	Regular perform	3

Psychosocial of adaptation questionnaire. The questionnaire consists of 21 items, divided into the measurement of adaptation behavior in three domains:

2.2 Self-concept of adaptation behavior questionnaire. The questionnaire is defined as the composite of beliefs and feelings about one self at a given time and is from internal perceptions and perception of others' reactions. It's components include: the physical self, with involves sensation and body image and the personal self, which is made up of self-consistency, self-ideal or expectancy, and the moral-ethical-spiritual self.

2.3 Role functions of adaptation behavior questionnaire. The questionnaire is defined as the composite of functioning unit of society; as a set of expectations about how a person occupying one position behaves toward a person occupying another position. The basic need underlying the role function has been identified as social integrity, Persons perform primary role determines the majority of behavior engaged in by the person during a particular period of life. It is determined by age, sex, and developmental stage. Secondary roles are those that a person assumes to complete the task associated with a developmental stage and primary role for example, wife,

mother, and teacher. Finally, tertiary roles are related primarily to secondary roles and represent ways in which individuals meet their role associated obligations. Tertiary roles are normally temporary in nature, freely chosen by the individual, such as patients.

2.4 Interdependence of adaptation behavior questionnaire. The questionnaire is focuses on close relationships (individually and collectively) that result in the giving and receiving of love, respect, and value. In general, these contributive and receptive behaviors occur between the person and the most significant other or between the person and his or her support system. Affection adequacy is the goal of the interdependence adaptive mode.

The response for psychosocial of adaptation questionnaire is then given in a 4-level Likert scale format. The scoring criteria were the following:

Level of frequency	frequency of the behavior	Adaptation score	
		Positive Statement	Negative Statement
Rarely or None of the time	Rarely or never perform	0	3
Some or None of the time	Sometime perform	1	2
Occasionally or Moderate amount of the time	Frequently perform	2	1
Most or All of the time	Regular perform	3	0

Among the 21 items, there were both positive and negative statements, as list below.

Eight negative statements were item no 1, 2, 3, 4, 6, 14, 19, and 20.

Thirteen positive statements were item no 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, and 21.

Total possible score ranged from 0 to 105. In this study, the cut point for adaptation level was identified by using adaptation median score of the sample. The interpretation of the score was set at four levels (1-4) as follow:

Less than 66: Poor adaptation

66-73: Fair adaptation

74-78: Good adaptation

More than 78: Very Good adaptation

Validity of the Instruments

Instrument Validity

Content validity of demographic characteristic questionnaire, The CES–D questionnaire, and adaptation questionnaire assessment was given to five experts in the area of cardiovascular disease. There is one cardiologist, one nursing instructor specialized in cardiac nursing, one nursing instructor specialized in psychiatric nursing, and two advance practice nurses in cardiovascular nursing.

Instrument Reliability

After being modified and corrected based on experts' advise, instruments are tested with 30 heart failure patients who had the same characteristics as proposed samples (Cohen & Manion, 1994). The reliability of the instruments is tested using Cronbach's alpha coefficient giving the CES–D questionnaire = 0.88 and adaptation questionnaire = 0.79

Collection of Data

Data were collected by researcher in the following steps as below:

1. The research proposal was submitted for approval from the Ethic Committee of Research in Human Subjects of Mahidol University and the Chest Disease Institute, Nonthaburi Province.

2. An introducting letter from the Faculty of Graduate Studies, Mahidol University was submitted to director of Chest Disease Institute, Nonthaburi Province asking for permission to collect data at the out-patient department form Monday to Friday between 8.00-12.00 P.M.

3. After the research project was certified, the researcher met head nurse and staff nurses of out patient department to introduce research objectives and inform about the study for cooperation. The researcher conducted collection by herself. The procedures were as follows:

3.1 The researcher reviewed medical records to find out patients who meet the inclusion criteria. Aproxinately, 300 records were review each day, and 40-50 records are recruited.

3.2 All recruited records were confirmed for stage B and C of heart failure by a cardiologist of Chest Disease Institute.

3.3 On the day of collecting data, the researcher introduced herself and informed the objectives of the study to clarify the research. This step was carried out with a full awareness of the patient's rights in making decision independently. When they agreed to participate, the informed consent and information sheets for protect human's right were given (Appendix D). The sample and the researcher signed the informed consent forms.

3.4 The sample was invited to answer the questionnaire at a quiet place while they were waiting for doctor service before 09.00 A.M. or after doctor service while they were waiting for medicine of pharmacy center. Each question was read to the sample and replies were noted in the questionnaire by the researcher if the sample have visual problem.

3.5. Researcher collected the data using instruments part 1 to 3 (adaptation questionnaire, CES-D, and personal information). Estimated time used for all instruments was approximately 20-30 minutes.

3.6 The sample could ask any questions and gave responses independently during the process, but they might ask questions if there any doubt. The researcher will give answers to their inquiries without guiding their responses. If the sample did not allow the data collection process to continue, the researcher discontinued the data collection and let them withdraw from the study.

3.7 If the sample had any abnormal sign and symptoms during this time, they would received primary care instantly and would be transferred for further treatment. However, their refusal to give information or to answer any questions would not affect on the services they were receiving from the hospital.

3.8 After completing the questionnaires, the researcher marked on the medical record in order to prevent collecting the same sample. The researcher thanked the sample for their cooperation. There were about 5-6 samples per day completed the questionnaires. All of the patients who were asked to participate in the study were willing to participate and complete the questionnaires.

3.9 The completed questionnaires were subsequently analyzed by using selected statistical methods.

Protection of the Subject's rights

Researcher is fully aware of research ethics therefore samples' dignity, values, and protection of impacts that could happen during data collection and use of data are assured throughout the research process. Before collecting data, the proposal of this research was submitted to the Ethic Committee of Research in Humans of the Mahidol University and Chest Disease Institute, Nonthaburi Province for the examination and approval of the Committee. After receiving approval, the researcher prepared and information sheet to explain the sample about the objectives of the study, Subjects could make decision whether or not to participate in the study. Agreeing or not willing to participate did not affect the way patients were treated. Data obtained from the study were confidential and were used only in this study. Research provided sample opportunities for patients to ask questions or express concerns at any point. The inform consent was signed when the patients agreed to participate in the study. The record of data did not include name or address of the subjects. The obtained data were analyzed as a whole and be used for academic purpose only.

This research did not pose any potential risk to the subjects, as it was conducted with questionnaire method. Nevertheless, the answer took about 20-30 minute and if the sample had any abnormal signs and symptoms during this time, they would received primary care instantly and would be transferred for further treatment.

Data Analysis

Data were analyzed according to the following procedures:

1. Test of instruments; adaptation questionnaire and the CES–D questionnaire are tested for internal consistency reliability in this study is calculated using Cronbach's alpha coefficient.
2. Test of basic statistical; Demographic data are analyzed with the frequency, percentage, range, mean, and standard deviation.
3. Test of hypothesis;

3.1 The relationships between selected factors; gender, age, status, educational level, income, duration of illness with heart failure, stage of heart failure, depressive symptoms, and adaptation in heart failure patients, are tested with the Pearson's Product Moment Correlation Coefficient at significant levels of .05.

3.2 The relationships among selected factors; gender, age, status, educational level, income, duration of illness with heart failure, stage of heart failure, depressive symptoms, and adaptation in heart failure patients, are tested for predictive ability with multiple regression.

CHAPTER IV
RESULTS

The purpose of this study was to examine the factors influencing adaptation of heart failure patients. Data were collected with 109 heart failure patients at outpatient department, Chest Disease Institute, Nonthaburi Province, from October to November 2007. The results in this study were presented into four parts as follows:

Part 1: Demographic data of the sample, presented in percentages as classified by gender, age, status, educational level, income, duration of illness with heart failure, and stage of heart failure, are presented in tables 1.

Part 2: The score of depressive symptoms and adaptation among heart failure patients, presented in percentages, means, and standard deviations, are presented in tables 2 to 7.

Part 3: Predicting power of independent variables on adaptation among heart failure patients are presented in table 8 to 9.

Part 1: Demographic characteristics of patients with heart failure.

Table 1 Demographic characteristics of patients with heart failure. (n=109)

Characteristics	Frequency	Percentage
Gender		
Male	55	50.5
Female	54	49.5
Age (years)		
21-40	17	15.6
41-60	25	22.9
61-70	42	38.5
71-80	18	16.5
81-93	7	6.4
(Mean = 60.43; S.D. = 15.59; Min = 22; Max = 93)		
Marital Status		
Single/widowed/divorced/separate	26	23.9
Married	83	76.1
Educational Level		
None	4	3.7
Primary level	62	56.9
Secondary level	22	20.2
Vocational diploma/Associate degree	9	8.3
Bachelor degree	11	10.1
Higher than Bachelor degree	1	0.9

Table 1 Demographic characteristics of patients with heart failure. (n=109) (Continued)

Characteristics	Frequency	Percentage
Occupation		
Unemployed; House wife or retired	48	44.0
Government service	17	15.6
General hired worker	15	13.8
Merchandise	12	11.0
Agriculturist	10	9.2
Hermit	4	3.7
Student	3	2.8
Average income (bath/month)		
< 5,000	55	50.5
5,001-10,000	22	20.2
10,001-20,000	19	17.4
20,001-30,000	5	4.6
>30,000	8	7.3
(Mean = 18,235.58; Mode = 10,000; Median = 5,000.00; S.D. = 51013.14; Min = 0; Max = 400,000)		
Duration since diagnosed with heart failure (years)		
Less than 1	26	23.9
1- 5	62	56.9
6-10	13	11.9
More than 10	8	7.3
(Mean = 2.03; S.D. = .81; Mode = 2; Min = 1, Max = 4)		
Stage of heart failure		
Stage B	47	43.1
Stage C	62	56.9

Table 1 Demographic characteristics of patients with heart failure. (n=109) (Continued)

Characteristics	Frequency	Percentage
New York Heart Association (NYHA) Functional Classification		
Class 1	77	70.6
Class 2	31	28.4
Class 3	1	0.9
Structural of heart disease *		
Coronary artery disease	64	58.7
Hypertension	47	43.1
Valular heart disease	41	37.6
Dyslipidemia	39	35.8
Diabetic mellitus	30	27.5
Cardiac arrhythmias	1	14.7

* Some patients had more than one disease of illness.

As show in table 1, the findings shows number females of 49.5% and males of 50.5%. More than three quarters (76.1 %) are married. Sixty point four percentages are aged older than 60 years. Average age of the samples are 60.43 (S.D. = 15.59). The maximum age of the sample is 93 years old, while the youngest is 22 years old. Fifty-six point nine percentage of the sample had primary school, half of the sample (50.5%) had income less than 5000 bath/month (Mean = 18,235.58). The sample reported that they had been diagnosed as having stage heart failure for 1-5 years (56.9%) with the mean duration of 2.03 (S.D. = .81). About three quarter of the sample (70.6%) are functional Class I of NYHA and more than half (56.9 %) are stage C, and 43.1% are stage B. The sample had structural of heart diseases including coronary artery disease (58.7%), hypertension (43.1%), valvular heart disease (37.6%), dyslipidemia (35.8%), diabetic mellitus (27.5%), and cardiac arrhythmias (14.7%).

Part 2: Description of depression and adaptation among heart failure patients, presented in range, mean, standard deviation, and percentage.

Table 2 Range, mean, standard deviation of depression and adaptation among heart failure patients (n=109)

Variables	Possible Range	Actual Range	Mean	S.D.	Skewness	
					Statistic	Std. Error
Depression	0 - 60	0 –38	7.22	7.67	1.83	.23
Adaptation	0-105	44 – 93	71.50	10.19	-.33	.23

The descriptive statistics of the variables of interest are presented in table 2. Firstly, the mean score of depression in this study is 7.22 (S.D. = 7.67). The score of 19 are used as cut point for depression; therefore, a depressive symptom of the sample is at a low level. Secondary, the total actual score ranged from 44 to 93, and the mean score of adaptation is 71.50 (S.D. = 10.19).

Table 3 Prevalence of depression of sample. (n=109)

Level	Range	Frequency	Percentage
Not depressed	0-18	101	92.7
Depression	≥19	8	7.3

The descriptive statistics of the variables of interest in table 3. The scores of 19 are used as a cut point for depression; therefore, the level of depression among the samples (n=109) are found mostly (92.7%) in a not depressed, and depression in this study is 7.3%.

Table 4 Prevalence of depression in stage of heart failure. (n=109)

Variables	Number	Percentage	Range	Mean	S.D.
Not depressed	101	92.7	0-18	5.59	4.90
Stage B	46	42.2	0-17	4.70	5.22
Stage C	55	50.5	0-18	6.35	4.54
Depression	8	7.3	20-38	27.75	6.73
Stage B	1	0.9	20-20	20.00	0.00
Stage C	7	6.4	22-38	28.86	6.44

The presence of prevalence of depression in stage of heart failure as demonstrates in table 4. Among the 109 (100%) patients who completed the CES-D, 101 (92.7%) met criteria for no depression, and stage of heart failure show stage B 41.1% (n = 46) and stage C 50.5% (n = 55). Thus, only 7.3% (n = 8) met criteria for depression, are classified stage B 0.9% (n = 1), and Stage C 6.4% (n = 7).

Table 5 Level of adaptation in patients with heart failure. (n=109)

Level of adaptation	Score	Number	Percentage
Very good	more than 79	26	23.9
Good	74 - 79	26	23.9
Fair	66 - 73	27	24.8
Poor	less than 66	30	27.5

According to Table 5 the adaptation level among the subjects (n = 109), nearly number are found in each level. The frequencies from the greatest to the smallest number are as follows; at a poor level (n = 30; 27.5%), a fair level (n =27; 24.8%), a good level (n = 26; 23.9%), and a very good level (n = 26; 23.9%).

Table 6 Means, median score and standard deviations of adaptation mode in patients with heart failure. (n=109)

Adaptation	Possible Range	Actual Range	Median	Mean	S.D.	Percentage
Physical	0 - 42	8 -36	20.00	20.59	5.18	49.02
Self-concept	0 - 30	12-30	25.00	24.42	4.31	81.40
Role function	0 - 24	9 - 24	19.00	19.52	3.27	81.33
Interdependent	0 - 9	1 - 9	7.00	6.81	1.80	75.66
Overall adaptation	0-105	44 -93	73.00	71.50	10.19	68.08

As demonstrates in table 6, the mean of the overall adaptation of the sample in this study was 71.50 (68.08%; S.D. = 10.19). There is no cut point for adaptation. The mean of higher than the median point indicate the high level adaptation. Upon examining each category, the mean score of Physical adaptation is 20.59 (49.02%; S.D. = 5.18), Self-concept adaptation is 24.42 (81.40%; S.D. = 4.31), Role function adaptation is 19.52 (81.33%; S.D. = 3.27), and Interdependent is 6.81 (75.66%; S.D. =1.80).

Table 7 Level of adaptation in patients with heart failure categorized by stage of heart failure. (n =109)

Level of adaptation	Number	Percentage
Vary good	26	23.9
Stage B	13	11.9
Stage C	13	11.9
Good	26	23.9
Stage B	13	11.9
Stage C	13	11.9
Fair	27	24.8
Stage B	12	11.0
Stage C	15	13.8
Poor	30	27.5
Stage B	9	8.3
Stage C	21	19.3

According to table 7, the adaptation levels among the sample (n=109) are found nearly numbers at each level. The frequencies from the smallest to greatest numbers are as follows; at a poor level of stage B (n = 9; 8.3%), and stage C (n = 21; 19.3%), at a fair level of stage B (n = 12, 11.0 %), and stage C (n = 15; 13.8), a vary good level of stage B (n = 13, 11.9 %), and stage C (n = 13; 11.9%), a good level of stage B(n = 13; 11.9 %), and stage C (n = 13; 11.9%).

Part 3: Pearson's Product Moment Correlation Coefficient of the study variables

Table 8 The relationships between gender, age, marital status, educational level, income, duration of illness with heart failure, stage of heart failure, and depression to adaptation in patients with heart failure.(n=109)

Variables	1	2	3	4	5	6	7	8	9
1.Gender	1.000								
2.Age	.004	1.000							
3.Marital Status	-.307**	-.032	1.000						
4.Educational level	-.312**	-.309**	.103	1.000					
5.Income	-.162	.010	.092	.097	1.000				
6.Duration of Illness with heart failure	.018	-.068	.157	.040	-.149	1.000			
7.Stage of heart failure	.122	-.281**	.034	-.014	-.053	.146	1.000		
8. Depression	-.021	-.365**	-.116	.095	-.108	-.126	.251*	1.000	
9.Adaptation	-.009	-.061	.079	.207*	.269*	-.003	-.105	-.397**	1.000

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

The presence a matrix of relationships between dependent and independent variable are presented in table 8, The results revealed that educational level and income had significant positive correlation with adaptation ($r = .207$, $p < .05$; $r = .269$, $p < .05$), respectively and depressive symptoms had significant negative correlation with adaptation ($r = -.397$, $p < .01$).

Part 4: Predictive abilities of independent variables on adaptation among patients with heart failure.

Table 9 Regression analysis summaries between gender, age, marital status, educational level, income, duration of illness with heart failure, stage of heart failure, and depression, to adaptation of patients with heart failure.

Variables	B	SE B	β
Gender	1.787	1.924	.088
Age	-.116	.064	-.177
Marital status	.393	2.162	.017
Educational level	.425	.197	.203*
Income	4.103E-05	.000	.205*
Duration of heart failure	-1.230E-02	.022	-.050
Stage of heart failure	-.638	1.873	-.031
Depressive symptom	-.602	.126	-.453**

Adjusted R^2 = .235, R^2 = .292 (N = 109; ** p< .01,*p< .05)

A multiple regression analysis with enter method is performed to assess the predictive strength of gender, age, marital status, educational level, income, duration of illness with heart failure, stage of heart failure, and depressive symptoms, to adaptation of patients with heart failure. The finding presented in table 9 demonstrate all variables could simultaneously explain the variance of the adaptation at 29.2 % (Adjusted R^2 = .235, R^2 = .292) with the statistical level of .05. The β of depressive symptoms, income, and educational level were -.453, .205, and .203, respectively. This results demonstrated that depressive symptoms the most significant variable influencing adaptation of heart failure. Thus, the regression model would be as follow:

$$Y = 79.184 - .602_{\text{Depression}} + 4.103_{\text{Income}} + .425_{\text{Educational level}}$$

CHAPTER V
DISCUSSION

This research aims to study the factors which influence the adaptation of patients with heart failure. The sample is composed of 109 patients with heart failure who have received treatment at the outpatient clinic of the Department of Medical Cardiology, Chest Diseases Institute, Nonthaburi Province. The results are discussed in reference to demographic data of the sample, depression and the two research questions: 1) how is the adaptation of patients with heart failure? and 2) whether the adaptation of patients with heart failure can be predicted with certain factors such as gender, age, marital status, educational level, income, duration of illness, stage of heart failure, and depression, and how these factors predict the patients' adaptation?

1. Demographic Characteristics

It is found that 49.5% of the subjects are female and 50.5% are male. The sample's ages ranges from 22 to 93 years with the average age at 60.43 years. Most patients are older than 60 years (61.4%). These results are consistent with the report that the prevalence of heart failure increases with advancing ages (Bleumink et al., 2004; Chest Diseases Institute, 2005; Masoudi et al., 2002; Ministry of Public Health, 2005). The majority of the samples are married (76.1%) and they earn monthly income less than 5,000 baht (50.5%). More than half of the patients reported having education at primary level (56.9%) and the duration of illness is mostly 1 – 5 years (56.9%; average = 2.03). Among the whole sample, 58.6% are diagnosed with coronary artery disease; 43.1% with hypertension; 37.6% with valvular heart disease; 35.8% with hyperlipidemia; 27.5% with diabetes mellitus; and 14.7% with arrhythmia. These results are consistent with previous studies, which reported that heart failure in the elderly mostly results from hypertension, diabetes mellitus, and hyperlipidemia (Braunstein et al., 2003; Lloyd-Jones et al., 2002; Masoudi et al., 2002). According to the classification with reference to the ACC and AHA criteria (Hunt et al., 2005), the

43.1% of the sample were in stage B as they can perform activities of daily living. More than half of patients were in Stage C of heart failure (56.9%) or heart failure without symptoms. The Stage C of heart failure is structural heart disease consistent to the Class II, III functional status in the New York Heart Association Functional Class (Hunt et al, 2005). Thus these patients had experienced signs and symptoms of heart failure before. Nevertheless, they were discharged from the hospital without signs and symptoms of heart failure and were routinely scheduled for follow-up visits at the outpatient clinic. Regarding the cardiac function, 70.6% of the patients were in functional class I and 28.4% were in class II and they could perform activities of daily living.

2. Depression

The average of overall score of depression is 7.22 (S.D. = 7.67; Table 2), According to the CES-D questionnaire, a total score at or above 19 indicates depression (Kuptniratsaikul & Pekuman, 1997). Therefore, the results of this study show that 101 patients, or 92.7% of the sample, do not have depressive symptoms. It can be explained that the samples in this study are in stage B and C of heart failure. They can perform daily activities as usual and the heart condition does not have effect of their work or role performance. They come to the clinic to receive treatments. It is possible that after receiving medical treatments the illness has little physical and psychological impact on these patients. This is consistent with a study in patients with myocardial infarction. The study demonstrated functional class I, or mild severity of illness, they were able to perform activities of daily living without dyspnea; thus they felt encouraged to respond physical and mental adaptation for health promotion and could face with possible problems and threats (Tachakalaha, 1997). Reports from previous studies in patients with coronary artery disease post coronary angioplasty stated that after the treatment most of them were in the functional class I, and could perform activities as usual. Therefore, the patients were satisfied with treatment outcomes and demonstrated perceived illness at a good level (Voranan, 1998; Leingkobkij, 1999). The illness may have small psychological impact on the patients, resulting in depression score less than 19.

The analysis for Pearson correlation coefficient found negative correlation between age and depression with statistical significance ($r = -.365$, $p < .01$; Table 8). The study indicates that the older the patients the lesser depression they have. On the other hand who are young, the patients are most likely to have depressive symptoms.

This is probably because physical changes and problems from illness, especially heart disease, are common among elderly people. Thus the patients can accept them and have less depression. Data also shows that 44.0 % (Table 1) of the sample are unemployed or retired from work. They can enjoy their life and do not have to deal with work, which may lead to stress. In addition, about three quarters of the sample (70.6%) have cardiac functional class I that physical activities are not limited (Hunt et al., 2001). Those subjects are able to perform activities as usual. More than three quarters of the sample (76.1%) are married (Table 1). Therefore, they receive tender love and care, as well as mental support, from their spouses when they become ill. Spouses provide help and support them for modification of lifestyle so that they can live well with their illness. They also help the patients relieving and dealing with stress from the illness and treatment (Nakrat, 1990; Rattanamatanon, 1989). However, no relationship between age and depression is found.

Among 109 patients in this study, only 8 of them, or 7.3%, reach score of depressive symptoms higher than 19 points (range 20-38; Average 27.75; S.D. 6.73; Table 4). Among these 8 patients, 7 of them are stage C of heart failure with depressive symptoms range 22-38 (average = 28.86, S.D. = 6.44; Table 4). This result is consistent with a study in cardiac patients by Buran (2005) who used the CES-D questionnaire like this study. It was a study of patients with acute myocardial infarction presented with frequent unstable angina and the patients were in functional class II (stage C of heart failure). These patients had limitations in activity performance and the illness, especially the chest pain symptom, restricted their activities and had constant impact on them, causing anxiety and fear of abnormal symptoms. As a result 25.3% of these patients had depressive symptoms (Buran, 2005).

It is found that among 8 patients (7.3%) presented with depression in this study, only one patient (0.9%) is in heart failure stage B with depression scores of 20 points (Table 4). The patient is a 40 years old single female labor worker. She is

diagnosed with severe coronary artery stenosis with impaired left ventricular ejection fraction (EF = 35%) and is waiting for further investigations before receiving other treatment, either PCI or coronary artery bypass graft surgery, as the provided medical treatment do not fully improve her condition. It is possible that the severity of illness and uncertainty about process of investigation and treatment have psychological impact on this patient. The data from a study of patients with coronary artery disease shows that while waiting for the result of diagnostic test, the patients express worries about the examination result, complications or severity of the examination, and the management of treatment (Raungratanaampron, 1999). If the diagnostic examination shows abnormality which might not be completely cured in each medical visit, the problems constantly disturb the patients, physically and mentally. Such disturbance can be a stimulating factor that aggravates disease progression and increases risk of illness recurrence or acute exacerbation when the patients resume their usual life. This study also found that patients with depressive symptoms are diagnosed with more than one illness, which causes cardiac overwork and leads to left ventricular hypertrophy (LVH) and left ventricular dysfunction (LVD) (Table 1). Thus the patients are at risk of severe signs and symptoms of heart failure (Hosenbud & Greenberg, 2007). In addition, these patients require medical treatment with beta-blocker medications to enhance their cardiac function thus they are already at risk of depression, which is a side effect of medications (Ko et al., 2002, Ko et al., 2004). These factors have impact on physical condition and cardiac function, thus increasing the risk of disease progression to the extent of having signs and symptoms of heart failure. They also affect patients' mentality, causing stress and depression.

Among 109 patients in this study, only 7 patients (6.4%) with heart failure stage C have depression. The depression scores ranges from 22 to 38 (average = 28.86, S.D. = 6.44; Table 4). The data reveals that among these patients six of them are at comparatively younger ages of 21, 28, 37, 38, 41, and 49 years old (average = 35.67). They are diagnosed with severe cardiac pathophysiological conditions, comprised of severe mitral valve regurgitation with severe mitral valve stenosis, atrial fibrillation with mild aortic regurgitation, triple coronary artery stenosis, severe mitral valve regurgitation with left atrium clots, single coronary artery stenosis with dyslipidemia and hypertension, and STEMI with diabetic mellitus, respectively. They all work as

labor workers and are the main earner of the family. The other patient in this group is 63 years old and was diagnosed with triple coronary artery stenosis with 30% ejection fraction. The only choice of treatment for this patient is coronary artery bypass graft (CABG), which is already stated in the plan for his medical management.

The analysis for Pearson correlation coefficient found negative correlation between age and stage of heart failure with statistical significance ($r = -.281$, $p<.01$; Table 8). This indicates that the younger the patients are the severer condition they have. On the contrary, the older the patients are the less severe condition they have.

In addition to, four out of seven of patients with heart failure stage C are single and they have full responsibility of their life, including self-care practice. When they are ill with heart failure stage C, long-term rehabilitation is essential. Nevertheless, they still have problems of cardiac dysfunction, leading to significant limitation in performing labor work and risk of abnormal symptoms. Therefore, the illness have both physical and mental impacts and seemed life-threatening to these patients, resulting in the sense of insecurity. Moreover, they are in stage C of heart failure and receive more than two medications to improve cardiac function and prevent recurrence of signs and symptoms. These medications contribute to the risk of depression from mild to severe levels (Ko et al., 2002; Powell et al., 2005). A study in patients with coronary artery disease in functional class II or heart failure Stage C reports that the patients will have chest pain, dyspnea, and palpitation if they have inappropriate environmental management such as having the bedroom upstairs, using toilets in squatting position, having isometric physical activities of higher than 6 METs such as hand-washing or mopping the floor, digging or lifting object heavier than 20 kilograms. These patients are required readmission from the recurrence of myocardial infarction and heart failure within three weeks after hospital discharge (Phophet, 2001).

In this study, 55 patients with heart failure stage C, or 50.5% of the whole sample, did not have depression with the depression scores ranging from 0 - 18 (average = 6.35, S.D.= 4.54; Table 4). This is probably because even though these patients have lost normal cardiac function, experience signs and symptoms of heart failure and are hospitalized for symptomatic treatment. However, they do not have symptoms of heart failure after hospital discharge and can perform physical activities

as usual. Moreover, the duration of illness in this study is mostly 1 – 5 years (average = 2.03), which is long enough for the patients to develop perceived risk of illness. They experience heart failure and they may be afraid of having symptom recurrence. It is reported that patients with post-acute coronary syndrome with functional class II, they are comfortable at rest but have symptoms from physical activities of daily living which may lead to dyspnea, shortness of breath, or chest pain. However, if the left ventricular ejection fraction (LVEF) is good and the compensatory mechanism is not overloaded, the patients are at low risk of having signs and symptoms of heart failure. The illness, therefore, has non-severe physical impact, and the mental impact is consequently mild. As a result, the patients do not have depression.

A number of theories have been applied to explain the causes of depression. The occurrence of depression is associated with hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis, resulting in over-stimulation of parasympathetic and sympathetic nervous system (Gorman & Sloan, 2000; Huikuri & Makikallio, 2001). This stimulation leads to increased circulating catecholamines (adrenaline and noradrenaline) and serum cortisol (Browm, Varghese, & McEwen, 2004), blood cloting mechanisms (Kanel et al., 2001; Mann, 2002), vascular endothelial dysfunction of the coronary arteries (Broadley, Korazun, Jones, & Frenneaux, 2002; Rajagopalan et al., 2001), dysfunction of immune system activation (Anisman & Merali, 2002; Miller, Stetler, Carney, Freedland, & Banks, 2002; Musselman et al., 2000; Suazrez, Krishnan, & Lewis, 2003), and long-term hypertension (Borowicz et al., 2002; Davidsion et al., 2000). In addition to, insufficient serotonin also causes emotional problems such as depression (Musselman et al., 2000; Rains, 2002; Schins, Horning, Crijins, Baur, & Hamulak, 2003).

A number of studies on depression were conducted in several groups of patients with chronic illness. The examples are given below:

Salaycik and associates (2005) conducted an 8-year follow-up study in patients with stroke / TIA and found that single patients at relatively younger age are more likely to have depression than married patients at older age. This result is consistent with the result found in patients with heart failure stage B some patients with stage C in this study which also found that patients at relatively younger age are more likely to have depression than older patients ($r = -.365$, $p < .001$). However, the results

regarding marital status are different because this study found no relationship between marital status and depression ($r = -.116$, $p > .05$).

A study in female diabetic patients (fasting glucose level ≥ 126 mg%) aged 42 – 52 years (average = 46.4, S.D. = 2.7) who have been diagnosed for longer than three years found that older patients tend to have depression more often than the relatively younger ones (Everson-rose et al., 2004). The result from patients with heart failure stage B and C in this study, however, has shown that older patients are less likely to have depression, in comparison with patients at younger age ($r = -.365$, $p < .001$). This is probably because of the wide age range, 22 – 93 years old, and the high distribution of age among the sample of this study (Average 60.43, S.D. = 15.59).

Kasornsri conducted a study of depression in elderly patients with low level of visual disability or high level of visual impairment in 2006. The researcher used CES-D to measure depression and found the average score at 15.6, or no depression. The aforementioned score, however, is higher than the average score found in this study (7.22). This is probably because the patients with visual disability or visual impairment are dependent on other people and feel lonely, afraid and insecure. As a result, the score of depression is at high level. In this study, 70.6% of the samples are in functional class I and 28.4% are in functional class II. These patients can perform activities of daily living and are not totally dependent on other people, thus they do not feel that they are burden.

Moussas and associates (2007) studied three groups of patients with respiratory disease aged 39 – 70 years. The three groups comprised of groups of patients with bronchial asthma (BA), chronic obstructive pulmonary disease (COPD) and tuberculosis (TB) with the sample size 42, 60 and 30, respectively. It is found that patients with COPD have depression at a higher percentage than patients with BA and TB. This is probably because patients with BA and TB can recover from the illness and they can return to their previous lifestyle (Campbell & Payne, 2001). The study by Moussas and associates also found positive relation between depression and the sample's age and length of time after the diagnosis. However, data shows that patients with COPD are mostly elderly (average = 66.03) and have a long period of illness (Average = 13.46). Patients with COPD suffer from progressive severity of symptoms, which contribute to increased limitations in activity performance over a longer period

of illness (Weaver, Richmond, & Narsavage, 1997; Halpin, 2001). The patients have acute and severe exacerbation in response to stimuli and lose abilities to perform daily activities. As a result, they suffer from disabilities and dependency on other people, as well as dependency on oxygen (American Lung Association, 2002). Therefore, the percentage of patients with COPD with depression in the aforementioned study is as high as 49.2. This study found negative relationship between age and depression ($r = -.365$, $p < .001$) and no relation between period of illness and depression ($r = -.126$, $p > .05$). Even though some patients with heart failure stage C in this study have experienced signs and symptoms of heart failure and have been hospitalized because of the illness, their condition is well controlled after receiving treatment and they do not have limitations in performing activities of daily living. It is found that 70.6% of the samples in this study are in functional class I and 28.4% are in functional class II. The patient in these groups are able to conduct self care and have no oxygen dependency, thus the percentage of patients with depression is only 7.3.

A study conducted by Buran (2005) investigated depression in 150 patients with acute myocardial infarction with an average age of 55.4 years. The patients were in functional class I and class II and did not have severe complications that required hospitalization. The study found positive relationship between the class of cardiac function and depression. However, a detailed investigation revealed that most patients were in functional class II and patients in this class usually have experience of signs and symptoms of heart failure (Hunt et al., 2005). The cardiac functional class II is characteristically consistent with the stage C of heart failure as patients do not have the severe symptoms that are so severe to the extent of need for hospitalization. Nevertheless, the result that shows no relationship between age and depression may be due to the sample's age as most patients were in working age (average = 55.4) and they still had social and family responsibilities.

This study found positive relationship between stage of heart failure and depression ($r = .251$, $p < .05$). This result supports the aforementioned study by Buran. It is probably because among 109 patients in this study, 56.9% are in stage C of heart failure and the patients do not have severe symptoms or complications that require hospitalization, like patients in Buran's study.

The following discussion is presented in reference to research questions.

1. How is the adaptation of heart failure patients?

The sample of this study achieve scores of adaptation in the range between 44 and 93 points with the average score 71.50 (S.D. = 10.19; Table 2), indicating that the majority of the sample are at a fair level of adaptation (Table 7). The results can be explained as follows:

The samples are found nearly numbers in each stage of heart failure; 56.9% are in stage C, and 43.1% are stage B of heart failure. It is found that 70.6 % of the sample had cardiac function in functional class I or unlimited by physical activities after receiving medical treatment. The patients in this stage can perform their work or activities of daily living with no need help from other people. The stage B and C of heart failure patients regularly receive medical care at the outpatient cardiology clinic, with no signs and symptoms of heart failure, and not hospitalized. Thus, the score of adaptation of the sample is at a fair level.

There are 30 patients (27.5%) at a poor level of adaptation and 9 (8.3%) of them are at stage B of heart failure (Table 7). This is probably because most patients have coronary artery disease (6 out of 9) and they require medical treatment with percutaneous coronary intervention (PCI) for coronary angioplasty. However, only one treatment of PCI cannot correct all affected coronary arteries, especially when the sclerotic artery is very small (Park et al., 2003). Then they have to wait for coronary artery bypass graft (CABG) surgery. Therefore, after they are discharged from the hospital the patients may have chest pain on exertion. They are also at risk of having recurrence of myocardial infarction (Polkanchanakorn, 1998).

As the pathological condition still progresses, the patients are at risk of exacerbation of symptoms and restenosis. It is shown in previous studies that patients with coronary artery disease are at risk of restenosis by 10 – 40% after receiving PCI (Bhargava, Karthikeyan, Abizaid, & Mehran, 2003; Grech, 2003; Morice et al., 2002; Park et al., 2003). Moreover, the patients in this group, 7 of 9 patients are old age of 61, 63, 64, 68, 72, 83, and 90 years old (average = 71.4) and they may have adaptation problems when having signs and symptoms of heart failure. A study in patients with heart failure of younger age (average = 54 years old) found that the compliance with treatment is as high as 96% and the patients demonstrate good adaptation in observing

abnormal symptoms and reporting the symptoms to physicians better than elderly patients (Evangelita et al., 2001). Patients who never experience symptoms of heart failure, such as shortness of breath or edema, may not weigh themselves regularly or detect weight gain early (Artinian et al., 2002). It is possible that elderly patients who never have signs and symptoms of heart failure may have poorer adaptation.

Other 21 patients demonstrating poor adaptation are in stage C of heart failure (19.3%; Table 7). These patients have experienced signs and symptoms of heart failure. They receive treatments continuously and there are no any symptoms. However, the pathological changes have led to increased risk of recurrence if the heart is overloaded or the condition of coronary artery is worsened. The patients may subsequently suffer from chest pain and heart failure. Therefore, the physical activities have to be limited as some activities may lead to symptoms such as dyspnea or chest pain. Some patients have experienced symptoms of heart failure and their performance of physical activities is limited, as the activities may induce signs and symptoms of heart failure such as shortness of breath or chest pain. The findings of this study are similar to the study in patients with valvula heart disease and functional class III or stage C. The patient had been ill for longer than five years and suffered from overt heart failure that causes frequent and severe dyspnea. It is found that the patients had dyspnea along with palpitation or tightness of chest and they felt irritable during the exacerbation of symptoms (Maneesilp, 2000). Frequent dyspnea on a daily basis affects patients' activity performance as they suffer from physical and mental fatigue or lack of energy to take part in daily life, leading to psychological distress (Yu et al., 2004). It is found that patients with functional class II who have to do housework by themselves have chest pain, dyspnea, and palpitation after they are discharged from the hospital and need re-admission because of severe recurrence of myocardial infarction, heart failure, and pulmonary congestion caused by exertion (Phophet, 2001). Report from a study in patients with heart failure functional class III and IV states that dyspnea and edema are common causes of re-admission and the patients have problems concerning medication compliance and low-salt diet (Boontheang, 2002). These factors have effects on health and they can exacerbate the symptoms of illness, thus the patients have poor adaptation.

For the adaptation in each mode, this study found the following results (Table 6): the average of total score is 71.50 (S.D. = 10.19); the average of adaptation score in physiological mode is 20.59 (S.D. = 5.18); the average in self-concept mode is 24.42 (S.D. = 4.31); the average in role function mode is 19.52 (S.D. = 3.27); and the average in interdependence mode is 6.81 (S.D. = 1.80). The result of each mode is discussed below:

Physiological mode. The average adaptation score of the sample is 20.59 (49.0%; Table 6) with the actual range 8 – 36. This result may be due to the fact that 56.9% of the samples are in stage C of heart failure. Patients with heart failure stage C have cardiac structural impairments and cardiac dysfunction due to the changes in cardiac muscle, including ventricular remodeling which leads to alterations in shape, cavity size, and wall thickness. These changes cause impaired ejection and capacity, and the cardiac output subsequently is reduced. Other related organs then have compensatory reactions to raise the volume in the circulation system. If this condition persists for a long period, the person will have sings and symptoms of heart failure (Katz, 2000). Treatment of left ventricular systolic dysfunction, including pharmacological treatment, is provided in order to reverse cardiac remodeling and the symptoms may subsequently improve and morbidity is reduced (Greenberg & Barnard, 2005; Young & Mills, 2004). Approximately half of the samples in this study are in stage B of heart failure (43.1%). The patients have no signs and symptoms of heart failure but they have structural heart disease, such as abnormal left ventricular function, and left ventricular hypertrophy.

The samples of this study are in stage B (43.1%) and stage C (56.9%) of heart failure. The majority of them are in functional class I, as identified with the NYHA system (70.6%). After receiving medical treatment at the outpatient cardiology clinic they could perform work or activities of daily living and did not need help from other people. These patients did not need hospitalizations because there was no sign and symptom of heart failure and no critical or life-threatening physical condition. It is possible that the patients were not aware of the importance of adaptation, thus the percentage of average adaptation score in physical mode is low (49.0%).

Nevertheless, the patients need to adapt in order to control and prevent/reduce risk factors, slow disease progression, and improve survival chance. Detailed study of

the results found that the patients demonstrate good adaptation in physiological mode regarding hobbies, daily activities, regular work, and prevention of constipation at 84.4, 82.6, 63.3, and 62.4 percentages, respectively (Appendix E). It can be explained that even though patients in stage B or C of heart failure have disease progression to the extent of cardiac dysfunction, the reception of various treatments can help the patients by increasing oxygenation to the heart, leading to improved symptoms and physical recovery. Physical capacity is then elevated until the patients can perform various activities for a longer time or with better endurance (Leingkobkij, 1999). It is found that patients with coronary artery disease in functional class I who did not have complications can exercise regularly or can have physical adaptation by avoiding physical exertion (Inkoom, 1998; Laotrakul, 2000; Polkanchanakorn, 1998). They can also monitor symptoms and care for themselves by having continuous lifestyle modifications (Tumnong, 1998). Thus patients in this group achieved score of adaptation in physiological mode at higher points than the median.

It is found the sample in nearly numbers in stage B and C of heart failure. Seventy point six percentages of the sample are functional class I of NYHA. They are able to perform activities without help of other people. They may not be aware of the importance of symptom observations or have inadequate knowledge about drug usage and side effects (Chaimati, 2001). However, they also need to modify their lifestyle to prevent disease progression to higher level of severity. The lifestyle modifications include maintaining an appropriate diet, having regular exercise, maintaining a normal body weight, counseling on smoke cessation, and limiting alcohol consumption (Stampfer et al., 2000). These modifications should be conducted along with medication treatment, which may induce undesired side effects.

This study found that the patients have poor adaptation in some aspects of physiological mode, including checking pulse rate before taking medication (81.7%) or when having abnormal symptoms (79.8%), observing the symptoms that require medical visit before the follow-up appointment (70.6%), observing symptoms from side effects of cardiac drugs (61.5%), and limiting water intake (57.8%). These findings are consistent with the result of previous studies. Patients with coronary artery disease have symptoms from medication side effects without knowing the cause of symptoms, they do not understand drug usage, symptom management, and do not

monitor abnormal symptoms by checking pulse rates (Chaimati, 2001). Another study reports that the patients do not check pulse rates before and after exercise (Inkoom, 1998). These inappropriate practices may be due to insufficient reception of knowledge and advice about the medications (Chaimati, 2001).

Self-concept mode. This study found the average score of adaptation in self-concept identity mode at 24.42 (81.4%; Table 6) with the actual range 12 -30. The adaptation in this mode is the psychological adjustment that depends on the persons' belief and feeling in perceiving internal and external stimuli, which constantly change.

In this study, more than half of the samples (56.9%) and 43.1% are at stage C and stage B of heart failure, respectively. They do not present signs and symptoms of heart failure after receiving treatment. In addition, the functional class of 70.6% of the samples, is class I that is unlimited by physical activities (Hunt et al., 2001). Therefore, treatment options of these patients are prevention of development of severe signs and symptoms of heart failure that needed hospitalization. However, 60.4% of them are elderly and more than three quarter of the sample (76.1%) is married. They receive love and support from their families. When people at advanced age, either healthy or ill people, tend to less responsibility due to the characteristics of Thai society, they are still well loved and respected in the family and are able to give advice to family members as usual (Yosawat, 1992). When the patients became ill with heart disease, the families member provide them with worm support, and they do not allow them to work hard. Moreover, 44.0% of the patients in this study are retried or do only housework. They are able to help themselves. The older patients are found to express confidence in their capacity for treatments and can live independently in almost every way. (Schwarz & Elman, 2003). The patients who have these feelings may contribute to high self-esteem (Sumngeang, 2000).

Detailed study on each aspect of adaptation in self-concept identity mode found that the patients demonstrate consistent adaptation in response to the following items: having self-pride and feeling important to the family (89.9%), feeling well cared for from the healthcare team thus having improved health (77.1%), and being able to conduct various activities like other people (73.4%) (Appendix E). Physiological changes may have some mental impacts on the patients. When the patients are

informed about the diagnosis and treatment plan for their condition, they may feel insecure and anxious at the beginning (Yimburana, 1989).

When the patients receive treatment, however, they develop perceived benefits of treatment and perceived self-efficacy in managing their condition (Yotsawat, 1992; Voranan, 1998). As a result, the patients have increased self-esteem. They are satisfied with their lifestyle, have good emotional adjustment, and accept the illness, leading to good mental health (Vongsvivut, 1993). The patients also receive support and help from their spouse, are well accepted from the family and the society; therefore, they will accept reality, assess the situation and impacts on their life with understanding and, be prepared to cope with or solve the problem (Sumngean, 2000). The patients in Stage C of heart failure, however, have experienced signs and symptoms of heart failure such as reduced activity tolerance, dyspnea, and fluid retention (Goodlin, Mauptman, & Arnold, 2004). Thus they expressed poor adaptation in some aspects of self-concept identity mode, e.g. dissatisfied with physical changes after the illness (59.6%), worried that the symptoms will be increasingly severe and will affect their self-care ability (56.9%), and perceiving the illness as fate or misfortune (53.2%) (Appendix E). The percentage of poor adaptation in these aspects is not high. This is probably because most patients are at old ages (61.4%) and the majority of the samples are Buddhists (98.2%) (Appendix E). The application of religious teaching as guidelines for living, including the acceptance of illness as a natural life event and acceptance of physical changes as part of advancing ages and body deterioration, can strengthen the patients' mentality. These patients may cope with stress by letting it go, not thinking about the distress, and accepting the problem (Laotrakul, 2000). Thus, the average score of adaptation in self-concept identity mode is only slightly lower than the median.

Role function mode. The results of this study show that the average score of adaptation in role function mode is 19.52 (81.3%; Table 6) with the actual range 9 – 24. This is probably because the adaptation in role function mode aims for the maintenance of persons' stability in the society so that they can live in their usual social roles. People at advanced ages, either healthy or ill, tend to have less responsibility due to the characteristics of Thai family and society. Thai parents have less responsibility in child care when their children reach adult age, can provide for

themselves, and/or have their own family; but the parents are still well loved, respected and sought for advice. When elderly parents became ill with heart disease, the family members provide them with warm support, both mentally and financially, and try their best to save the parents' life. Previous studies in patients with coronary artery disease found that the illness do not have impact on the patients' role and function at work. They are still loved and respected in the family and are able to give advice to family members as usual (Yosawat, 1992). It is found that patients could do housework without having exacerbations of symptoms (Pariyawatee, 1999; Vongsvivut, 1993). Therefore, they are still confident in their physical ability, can perform their husbands or wives role, and are not afraid of having sexual intercourse (Pariyawatee, 1999; Polkanchanakorn, 1998; Tingmai, 1998; Vongsvivut, 1993). These patients can also meet other people and participate in social activities, thus effectively enhance their adaptation in role function mode (Laortrakul, 2000; Leingkobkij, 1999).

The sample of this study demonstrate consistent adaptation in the following aspects of role function mode: compliance with medical treatment and follow-up appointments (90.8%), performance of family roles and functions (82.6%), request for health information from the healthcare team (74.3%), and giving advice to other people (71.6%). (Appendix E). Previous studies in patients with heart failure found that the reception of advice about treatment and medication regimen, including other information about the healthcare system, encourage higher medication compliance (Ni et al., 1999; Roe, Motheral, Teitebaum, & Rich, 1999). Therefore, the patients are able to follow the medication regimen and they attend the follow-up appointments regularly, as well as making inquiries or seeking advice from health care staff if they have any problems.

Nevertheless, there are some aspects in role function mode of adaptation that the samples demonstrate poor adaptation. These aspects are self-care and observation of medication side effects (53.2%), regular work (50.5%) and participations in social activities (38.5%) (Appendix E). This is probably because 44.0% of the samples are employed and 22.9 % are the elderly aged between 71 and 93 years (Table 1). Moreover, apart from 11 patients in stage C of heart failure out of 25 patients in this group, the patients have other co-existing illness in addition to heart failure stage B.

With the more advanced ages (between 71 and 93 years; Table 1), these patients have limitations in joint and body movement and they become less active. They also have to be more careful in self-care; for instance, requiring low salt diet or restricted fluid intake to prevent exacerbation of symptoms. These patients may find that they can not control these factors when participating in social activities.

Interdependence mode. The results of this study show that the average score of adaptation in interdependence mode is 6.81 (75.7%; Table 6) with the actual range 1 – 9. The adaptation in interdependence mode results from close interpersonal relationship through both giving and taking in various aspects, including mutual love, respect, admiration, and honor. Further investigation of the results found consistent adaptation in aspect of self-care regarding performance of activities of daily living (83.5%) (Appendix E). The explanation of this might be the fact that the majority of the sample is in functional class I (70.6%) and there is no limitation of physical capacity. They feet confident about their self-care ability and can live independently in almost every way. Contrary, 22.9 % of the patients are aged between 71 and 93 years (Table1) and impaired physical activities can be found. Thus, they are depended on other people in performing activities especially activities of daily living. These may contribute to the poor adaptation in interdependence mode in aspect of fear of being dependent for the rest of their life (72.5%)

II. Can the adaptation of patients with heart failure be predicted with certain factors such as gender, age, marital status, education level, income, duration of illness, stage of heart failure, and depression; and how do these factors predict the patients' adaptation?

This study found that certain factors, such as gender, age, marital status, education level, income, duration of illness, stage of heart failure, and depression could predict the adaptation in patients with heart failure by 29.2% (Adjusted R square = .235, R square = .292) with the statistical level of .05. The factors that can significantly predict adaptation include depression, income, and education level with a p-value of .000, .021 and .033, respectively. The β of depression, income, and educational were -.453, .205, and .203, respectively. The results are discussed in details below:

1. Depression

This study found negative correlation between depression and patients' adaptation with statistical significance ($r = -.397$, $p < .01$; Table 8). Depression is found to be related to the patients' adaptation more than other predictive factors and it has the strongest predictive power ($\beta = -.453$, $p < .01$; Table 9). This finding indicates that patients' adaptation is poorer when they have depression, or the patients have good adaptation when they do not have depression. It is consistent with studies in patients with heart failure which reported that depression is derived from either acute or chronic physical illness, feeling of distresses, suffering from morbidity, limitations in various aspects of living, and some treatment plans (Sauve et al., 2002). These conditions have psychological impact, leading to depression as they cause the feelings of despair, hopelessness, fear, insecurity, and loss of self-esteem. The patients may feel dispirited to conduct health practice and live with fear of the future (Sauve et al., 2002). It is found that patients with the functional status at worse NYHA class easily have depression in addition to their illness, causing them to have less activity, and get tired easily (Jiwseabpong, 2005). The symptoms constantly change and the patients have neuroendocrine and immune dysfunction (Pariante & Miller, 2001; Zuccala, Cocchi, & Carbonin, 1995). There is also the problem of sympathetic nervous system dysregulation (Gorman & Sloan, 2000; Huikuri & Makikallio, 2001). These internal changes have physical impacts, as they cause dyspnea and severe fatigue (Sullivan, LaCroix, Spertus, & Hecht, 2000). When the patients have dyspnea more frequently, they have fluid retention, and have decreased ability for self-care, the adaptation to illness is subsided (Ramasamy et al., 2006).

Moreover, the patients develop the feelings of uncertainty, worry, anxiety, powerlessness, worthlessness, and insecurity (Rhodes & Bowles, 2002). When the patients have severe depression and require medical treatment, the physical rehabilitation is delayed (Matensson, Karlsson, & Fridlund, 1998). If the patients do not receive continuous treatment, they have slow physical rehabilitation (Havarek, Ware, & Lowes, 1999), decline in activities in daily living (Jiang et al., 2001; Murberg et al., 1999; Vaccarono et al., 2001), presents more clinical heart failure symptoms including sleep disturbance and loss of appetite (Gottlieb et al., 2004; Lesman-Leegte et al., 2006). Then, they are burden to the caregivers or their families (Sareewiwatthana et

al., 1997). It is reported that the feeling of distress or anxiety in patients with heart failure can predict patients' diet compliance and exercise compliance (Evangelista et al., 2001) nonadherence to health recommendations in patients with coronary artery disease (Pulsook & Ua-Kit, 2007).

2. Income

This study found positive correlation between the patients' income and the adaptation with statistical significance ($r = .269$, $p < .05$; Table 8). Income is found to be related to patients' adaptation at the second rank and also have predictive power at the second ($\beta = .205$, $p<.05$), following depression (Table 9). This indicates that the patients have good adaptation when they have high income or have poorer adaptation with lower income. Data shows that nearly half of the patients in this study are unemployed (44.0%); and more than half of them are elderly (61.4%), who receive financial support from spouses, offspring, or relatives. Patients with heart disease require continuous medication treatment and various medical interventions to prevent complications or to slow disease progression, as well as to prevent signs and symptoms of heart failure. Although most patients in this study report having monthly income less than 5,000 baht, they report sufficient income and having money left for saving at 45.9 and 33.9%, respectively (Appendix E).

These may result from the patients' access to health insurance policy such as the Universal Health Policy of the National Health Insurance Office, the rights to refunding medical expenses, and the policy of direct coverage for government official; and the patients do not have to pay for medical expenses, thus the income is enough for their basic requirements and other resources for their living, including the cost of transportation to attend follow-up appointments. This result is consistent with the report from a previous study which states that higher income levels can predict self-care in patients with heart failure (Rockwell & Riegel, 2001). High income enables patients to answer to their basic primary needs and useful substances for their living. They are able to buy and seek healthy diet that is suitable for their conditions, leading to appropriate adaptation to the illness. On the contrary, low income, residence in remote areas, long-time traveling for medical visits, and inability to obtain Medicaid

insurance and services from specialists prohibit optimal post discharge care, leading to poorer adaptation (Philbin, Dec, Jenkins, & DiSalvo, 2001).

3. Educational level

This study found positive correlation between education level and patients' adaptation with statistical significance ($r = .207$, $p < .05$; Table 8). Education level is found related to patients' adaptation at the third rank, as well as its predictive power ($\beta = .203$, $p < .05$; Table 9). This result indicates that patients with high level of education have good adaptation whereas those with low level of education demonstrate poor adaptation, which is consistent with a report that education level can predict adaptation in patients with heart failure (Rockwell & Riegel, 2001). This is probably because when patients with high education level are ill, they seek knowledge and information from documents or books, as well as asking for advice from health professionals (Panidchakul, 1993; Phasunan, 1986). A study in patients with heart failure also found that patients with higher level of education can learn and develop critical thinking skills, as well as learning process; therefore, they can understand self-care maintenance and self-care management better than those with low level of education (Rockwell & Riegel, 2001). Patients with heart failure who are educated at low level may not be able to choose diet appropriate to their condition and are more likely to rely on high-sodium diet, canned foods, or TV dinner (Artinian et al., 2002).

Other predictive factors, such as gender, age, marital status, duration of illness, and stage of heart failure can also co-predict adaptation in patients with heart failure but the results show low predictive power ($\beta = .088, -.177, .017, -.050, -.031$; $p > .05$, respectively; Table 9). This is discussed in details below:

1.Gender

This study found no significant relation between gender and adaptation in patients with heart failure ($r = .009$, $p > .05$; Table 8). The result indicates that being male or female does not have any effect on the adaptation of patients with heart failure. It may be due to near numbers of male and female patients in this study, of which 50.5 percentage are male and 49.5% are female. Patients in this study are in Stage B and C found nearly numbers in each stage of heart failure. However, 70.6% of

the sample are class I cardiac function or being able to perform physical activities without limitation. Thus there are no differences in the adaptation of patients with heart failure among gender. Patients are in early elderly ages (average = 60.43) and are about half of sample unemployed (44.0%). These patients can perform activities of daily without having shortness of breath, palpitation, or dyspnea. In addition, more than half of the patients have coronary artery disease (58.7%), which can be treated with advanced medical intervention nowadays. Therefore, they are quickly diagnosed and the cardiac condition is quickly treated with no need of long-term hospitalization. The samples in this study demonstrate good adaptation regarding medication compliance and lifestyle modification. They can go back to live or work as usual. Thus there are no differences in the adaptation of male and female patients. Likewise, previous studies did not definitely conclude that gender could predict adaptation in patients. For example, gender can not predict treatment compliance in patients with myocardial infarction (Krervanichkij, 1988), and it can not predict self-care behavior in elderly patients with heart failure (Chriss, Sheposh, Carlon, & Riegel, 2004; Rockwell & Riegel, 2001).

However, after adjusting for NYHA classification, it is found that male patients demonstrate abilities in walking several blocks, climbing one flight of stairs, running errands, driving, visiting relatives or friends, and participating in community activities. Thus, male patients may be predicted as having self-care abilities (Chriss et al., 2004). Another study found that female patients demonstrate appropriate health perception and psychosocial adjustment to illness (Evangelista et al., 2001). They comply with health advice better than men (Polsook & Ua-Kit, 2007). This is probably because male patients are mostly retired elderly men and do not have to work hard anymore, whereas female patients still have housework and care giving responsibilities even though they are retired from regular works; thus female patients may not have physical and social adaptation as good as male patients (Reidinger et al., 2001).

2. Age

This study found that age is not significantly related to adaptation in patients with heart failure ($r = -.061$, $p > .05$; Table 8). This indicates that patients' age, neither

young nor old, has effect on their adaptation. The average age of the sample in this study is 60.43 years. However, these patients need to have appropriate lifestyle modification for their physical illness; for instance, smoke cessation, low- salt diet, low-fat diet, stress avoidance, regular exercise, and regular follow-up. Patients in any age group require the same lifestyle modification thus they need similar self-care practice and adaptation for their illness (Rockwell & Riegel, 2001). However, the results of studies on the predictive power of age on patients' adaptation seem to be inconsistent. For example, age can not predict patients' adaptation and treatment compliance in patients with myocardial infarction (Krervanichkij, 1988; Panidchakul, 1993; Rockwell & Riegel, 2001; Schwarz & Elman, 2003). On the contrary, a study reports that a higher age can predict self-care practice in patients with heart failure (Chriss et al., 2004) and exercise behaviors in patients with coronary artery disease (Namponkeang, 2004). The adaptation in self-care practice is especially good regarding medication-taking. This is probably because patients at older age have experience in taking medications over time whereas younger patients report their abnormal symptoms to the doctors (Artinian et al., 2002).

3. Marital status

This study found no relation between marital status and adaptation in patients with heart failure ($r = .079$, $p > .05$; Table 8). The result indicates that marital status, single, married, divorced, widowed or separated, do not have effect on the patients' adaptation. Most patients are in early elderly ages with the average age 60.43 years and have cardiac function in class I (70.6%) thus they are still able to care for themselves, and can perform various activities as usual. Whatever their marital status is, most patients in this study receive substantial care and support from their offspring, siblings, and relatives and are taken to receive medical care continuously. Therefore, the patients with different marital status demonstrate no difference in their adaptation. However, previous studies report inconsistent results regarding the correlation between marital status and patients' adaptation. For example, marital status can not predict treatment compliance in patients with heart failure (Krervanichkij, 1988). The same result is found in patients with myocardial infarction (Panidchakul, 1993).

However, a number of studies in patients with heart failure found that marital status can predict adaptation in patients with heart failure. This is because the patients' spouse provides care and support regarding information and knowledge about the illness. The appropriate performance of marital function help patients' adaptation regarding sustained adherence to complex dietary and water intake, exercise, mental support for smoke cessation, and compliance with medication regimens and follow-up appointments (Evangelista, Berg, & Dracup, 2001; Ni et al., 1999). Nevertheless, some unmarried patients with heart failure report that they adjust to abnormal symptoms or shortness of breath by taking a rest or monitoring their fluid intake. They may not be bound to household eating or activity patterns like married patients, thus unmarried patients can appropriately control their activities and have good adaptation to the illness (Artinian et al., 2002).

4. Duration of illness

This study found no relation between the duration of illness and adaptation in patients with heart failure ($r = -.003$, $p > .05$; Table 8). The result indicates that long duration of illness do not have effect on the patients' adaptation. This result may be due to the illness duration of patients in this study, which is mostly 1 – 5 years (56.9%). Moreover, more than half of the patients have coronary artery disease (58.7%). These patients receive medical treatment with advanced intervention in combination with effective medications thus the treatment and the illness do not have much impact on their living and adaptation. Moreover, patients having abnormal symptoms can quickly gain access to medical services nowadays. Thus they feel satisfied, hopeful, and motivated to receive treatment and to comply with medical advice for appropriate adaptation. As a result, the illness is well controlled; and the patients can exercise and perform activities, as well as go back to work as usual. Nevertheless, reports from a number of studies on the predictive power of illness on patients' adaptation are still inconsistent. For instance, duration of illness can not predict the adaptation regarding treatment compliance in patients with congestive heart failure (Krervanichkij, 1988). The same result is found in a study of patients with coronary artery disease who receive angioplasty (Leingkobkij, 1999).

On the contrary, a study in patients with myocardial infarction found that the duration of illness can predict patients' adaptation. This is probably because at the beginning of illness the patients refuse the illness and can not accept or adapt to the acute illness both physically and psychologically. However, after a period of treatment and cardiac function they have adjusted along with physical and mental adaptation mechanism, resulting in balanced condition. Therefore, longer duration of illness leads to better adaptation of the patients (Panidchakul, 1993).

5. Stage of heart failure

This study found that stage of heart failure is not related to adaptation in patients with heart failure ($r = -.105$, $p > .05$; Table 8). The result indicates that stage B or C of heart failure did not effect on the patients' adaptation.

This is probably because the data in this study is collected from patient receiving medical care and follow up at outpatient department. These patients are stage C and B of heart failure without signs and symptoms of heart failure. Seventy point six percentage of the sample is cardiac function class I of NYHA that physical activities are not limited. This result is consistent with a report from a previous study of coronary artery disease patients without signs and symptoms that functional class I do affect satisfaction with adherence to health recommendations (Polsook & Ua-kit, 2007). There are report studies correlations on the basis of the NYHA functional classification or symptoms severity on the adaptation hospitalized heart failure patients. Patients with severer symptoms have higher self-care. That is, those who are more symptomatic and functionally impaired or severer disease may be more motivated to learn, more knowledgeable about the symptoms requiring self-care, and engage in self-care with the intention of preventing exacerbation of disease than a patients with mild disease who fail to see importance of attending to self-care. Thus, understanding of the importance of various sign and symptoms of heart failure is improved (Rockwell & Riegel, 2001) and the patients are more likely to follow dietary compliance, exercise recommendations (Evangelista et al., 2001), and medication adherence (Artinian et al., 2003). On the contrary, some study findings suggest that severity of symptoms is negatively effects self-care (Nagy & Wolfe, 1984). However, patients with more symptoms may gain better understanding of the self-care needed

but have less energy to implement self-care. Although greater severity of cardiac illness and greater functional impairment predict higher hospitalization risk, the risk of hospital readmission significantly declines when the patients have poorer cardiac status and poorer functional status (Schwarz & Elman, 2003).

Nevertheless, the results reveals that age have negative correlation with stage of heart failure ($r = -.281$, $p > .01$; Table 8). The result indicates that older the patients less severe stage of heart failure they have, otherwise the younger the patients the severer stage of heart failure they have.

This result is consistent with the report from a previous study in patients with myocardial infraction. The findings state that the young patients report more severity of symptoms (Jewseabpongng, 2005). On the contrary, study also reports that old age and severe chronic heart failure NYHA classification III or IV are associated with limited functional abilities and impaired health-related physical (Ekman et al., 2002) and reduced ejection fraction is a potent predictor of death in elderly patients (Mahjoub et al., 2008).

The findings of this study are in consistent with Roy's adaptation model, which states that a person is an open system constantly interacting with both internal and external environments. It is necessary to adapt in response to the stimuli so that balanced condition can be maintained (Roy & Andrew, 1999; 1991a). The patients' adaptation, either good or poor, depends on the environment, which constantly changes. Adaptation occurs through regulator and cognator mechanisms. The adaptation outcomes are presented in four modes of adaptation behavior comprised of physical mode, self-concept mode, role function mode, and interdependence mode. Some factors which influence the adaptation of patients' can be both focal and contextual stimuli. Income and depression are contextual stimuli that are found mostly influential to the adaptation of patients in this study (Table 9). Certain factors which are investigated in this study can co-predict the adaptation in patients with heart failure by 29.2%.

CHAPTER VI
CONCLUSION

Summary of the study

This study is a predictive research aiming to examine factors influencing adaptation in patients with heart failure. The samples are composed of 109 patients with heart disease, either those with an absence of heart failure symptoms (stage B) or with history of or currently present with the symptoms (stage C). These patients received medical care at the heart clinic in Outpatient Department at Chest Diseases Institute. Data were collected from October to November 2007 with an interview questionnaire. The questionnaire used in this study consisted of three parts: demographic data questionnaire, the CES-D questionnaire, and the adaptation questionnaire. The reliability of instrument was examined with Cronbach's alpha coefficient, resulting in the alpha value scale 0.88 for the CES-D and 0.79 for the adaptation questionnaire. The obtained data are analyzed with the Statistical Package Standard computer program and descriptive statistical method used for the data analysis are frequency, percentage, range, mean, and standard deviation. Results are then calculated for the Pearson's product moment correlation coefficient and multiple regression coefficients. The findings of this study are summarized below.

1. The samples are composed of female and male patients at near numbers (49.5 % and 50.5%, respectively). The sample's age ranged from 22 to 93 years old. Most patients are older than 60 years (60.4 %) with an average age 60.43 (S.D. = 15.59). More than three quarter (76.1%) of the sample is married. More than half of them (56.9%) had primary school education. About half of the samples (44.0%) are unemployed. Approximately half of the sample (50.5%) had monthly income less than 5,000 baht (mean = 18,253.58). The duration of illness is mostly 1 – 5 years (56.9%, mean = 2.03, S.D. = .81). More than half of the samples (56.9%) are in stage C of heart failure, and about three quarter (70.6%) were in cardiac functional class I, in reference to the NYHA Functional Classification.

2. The average score of depressive symptoms is 7.22 (S.D. = 7.67).

3. The average score of overall adaptation is 71.50 (S.D. = 10.19). For each mode of adaptation, the average score of physical mode is 20.59 (49.0%; S.D. = 5.18), self-concept mode is 24.42 (81.4%; S.D = 4.31), role function mode 19.52 (81.3%; S.D. = 3.27), and interdependence mode is 6.81 (75.7%; S.D. = 1.80).

4. Certain factors such as gender, age, marital status, educational level, income, duration of illness, stage of heart failure, and depression can predict adaptation in patients with heart failure by 29.2% (R square = .292).

Recommendations

1. For nursing practice

1. This study found that some patients had poor physical adaptation in some aspects. Thus nurses should emphasize health education and provide more information concerning such topics, e.g. monitoring pulse rates, observing abnormal symptoms, side effects of cardiac drugs, restriction of fluid intake, and abnormal symptoms requiring medical consultation before the appointment. The provision of health education will promote good adaptation among the heart failure patients.

2. This study found that depression and stage of heart failure had negative correlation with age in patients with heart failure. It is also found that depressive symptoms and stage of heart failure were influent to the adaptation of younger patients with heart failure. This finding, therefore, should be used to promote awareness among nurses and other health care professionals about the importance of depression assessment with the CES-D in patients with various stages of heart failure. Moreover, nurses should conduct continuous assessments of patients' mental status, emotion, feeling, interaction, and behavior periodically. The assessment may start when the patients seek medical services for the first time and follow up through the duration of diagnosis and treatment with various interventions until the patients are discharged from the hospital. The obtained data concerning mental status could be analyzed and a plan could be subsequently drawn to help the patients adjust to the illness. The patients' family or spouse should also be invited to participate in the observation of depression by monitoring depressive symptoms. They should also participate in

making plans to care for the patients and provide mental support so that the patients can adapt to the illness effectively.

3. This study found that educational level and income are positively correlated with the adaptation of patients with heart failure. Thus, during each follow-up visit nurses should check whether patients with low income have any rights concerning medical expenses and ensure that the patients exercise their rights to make a claim for their expenses. The information about how to exercise one's right for health insurance should be publicly distributed or announced with a clear instruction and in simple words. There should be a coordination system for transfer to the office supervising the application of insurance policy in case of problems or difficulties in exercising the rights. These interventions will help promoting the patients' continuous adaptation to medical treatment.

2. For nursing research

1. There should be a study on other factors that may be influential to adaptation abilities in patients with heart failure, according to Roy's adaptation model, such as perceived severity of illness in each stage of heart failure.

2. Further study should be conducted in patients with heart failure in other stages with the research instrument that is suitable for patients' condition in each stage.

3. There should be studies with patients in other stages of heart failure in various settings.

4. Qualitative research or content analysis study about the adaptation in patients who have frequent recurrences of signs and symptoms of heart failure should be conducted.

5. Study of other psychological factors that may be influential to depression such as anxiety, stress, or uncertainty.

3. For nursing education

This study found that most patients of heart failure and are the elderly. Nursing students, therefore, should emphasize the knowledge and understanding about

various physiological changes in the elderly that have impacts on the illness and may lead to the presence of symptoms (stage A). The lesson should be emphasized on risk of heart failure and appropriate practice, including monitoring pulse rates and abnormal symptoms, side effects of cardiac drugs, restriction of fluid intake, and observation of abnormal symptoms before medical appointments. These practices can prevent heart failure symptoms and will promote appropriate and continuous adaptation among patients with heart failure.

Limitations

The sample of this study was selected with purposive sampling method and the data were collected at the outpatient department. The number of patients receiving medical care at the outpatient clinic was large – approximately 200 – 300 cases daily. The selection of sample according to the inclusion criteria resulted in the recruitment of 40 -50 patients in a day. However, the researcher collected data from the sample by herself and could not manage to obtain data from all recruited patients in one day. Thus the collection of data had to be delayed and adjusted until the number of subjects met the planned sample size.

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APPENDIX

APPENDIX A

LIST OF EXPERTS

There are five experts who validated the content of research instruments as follows:

1. Dr.Boonjong Seajueng
   Cardiologist staff at department of medicine, Chest Disease Institute

2. Miss. Patchanee Romtan
   Cardiac Care Unit, Chest Disease Institute.

3. Miss. Nongluk Tong-in
   Advance Practice Nurse and cardiovascular nursing, Administration Medical College and Vajira Hospital

4. Lect. Dr. Wannapa Suttiamnuaykul
   Faculty of Nursing, Mahidol University Bangkok, Thailand.

5. Asst. Prof. Dr. Wilaipun Sumboontanont
   Faculty of Nursing, Mahidol University Bangkok, Thailand.

APPENDIX B

INFORMATION SHEET

เอกสารคำอธิบาย / คำชี้แจงโครงการวิจัยแก่ผู้เข้าร่วมโครงการ (Information Sheet)

1. **หัวข้อวิจัย** ปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว

2. **วัตถุประสงค์และวิธีการวิจัย**

การปรับตัวของผู้ป่วย หมายถึง พฤติกรรมของผู้ป่วยที่แสดงออกถึงความสามารถในการตอบสนองต่อสิ่งแวดล้อมที่เปลี่ยนไปทั้งภายในและภายนอกร่างกาย เพื่อให้เกิดความมั่นคงของชีวิตตามความต้องการทางด้านร่างกาย จิตใจ(อัตมโนทัศน์) บทบาทหน้าที่และการพึ่งพาอาศัยซึ่งกันและกัน การปรับตัวจึงมีความสำคัญอย่างยิ่งเพราะร่างกาย และจิตใจ ทำงานประสานกันอย่างเป็นหนึ่งเดียวไม่สามารถแยกออกจากกันได้ เมื่อสาเหตุใดก็ตามเข้ามากระทบก็จะส่งผลซึ่งกันและกัน ถ้าผู้ป่วยภาวะหัวใจล้มเหลวมีปัญหาในการปรับตัว ก็จะส่งผลต่อการทำงานของส่วนต่างๆ ของร่างกาย ซึ่งอาจทำให้อาการและการเจ็บป่วยมีความรุนแรงขึ้นได้ ดังนั้นผู้วิจัยจึงสนใจที่จะศึกษาเรื่องนี้ ซึ่งมีวัตถุประสงค์ คือ

1. เพื่อศึกษาการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว
2. เพื่อศึกษาความสัมพันธ์ระหว่างปัจจัยบางประการ ได้แก่ เพศ อายุ สถานภาพสมรส ระดับการศึกษา รายได้ของผู้ป่วย ระยะเวลาในการเจ็บป่วย ระดับของภาวะหัวใจล้มเหลว และภาวะซึมเศร้า ที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว

วิธีการวิจัย เมื่อท่านสมัครใจเข้าร่วมโครงการวิจัยและลงนามในเอกสารยินยอมแล้ว ผู้วิจัยจะขอให้ท่านแบบสอบถามด้วยตนเอง โดยจะใช้ช่วงเวลาที่รอเรียกพบแพทย์ตรวจ หรือช่วงขณะเวลารอรับยา

3. **เหตุผลที่เชิญชวนให้ผู้ยินยอมตนให้ทำการวิจัยเข้าร่วมโครงการ**

ท่านเป็นผู้ป่วยโรคหัวใจที่มีอายุตั้งแต่ 18 ขึ้นไป ที่ยังไม่เคยมีอาการภาวะหัวใจล้มเหลวหรือเคยมีอาการภาวะหัวใจล้มเหลว แต่ไม่มีภาวะหัวใจล้มเหลวในระดับรุนแรง สามารถอ่านออกเขียนได้ ไม่มีการเจ็บป่วยทางจิต ไม่มีโรคสมองเสื่อม ไม่มีปัญหาทางการได้ยิน การมองเห็น และการพูดที่สามารถให้ข้อมูลในโครงการวิจัยได้ ถ้าท่านสมัครใจยินยอม

4. **ระยะเวลาที่ต้องทำการทดสอบผู้ยินยอมตนให้ทำการวิจัย**

เมื่อท่านยินดีเข้าร่วมโครงการวิจัยแล้ว ผู้วิจัยจะขอให้ท่านตอบแบบสอบถามจำนวน 3 ส่วน ประกอบด้วย แบบสอบถามการปรับตัว แบบสอบถามภาวะซึมเศร้า และแบบสอบถามข้อมูลส่วนบุคคล จำนวน 65 ข้อ ใช้เวลาในการทำแบบสอบถามประมาณ 20-30 นาที

5. **ประโยชน์ที่คาดว่าจะเกิดขึ้นต่อผู้ยินยอมตนให้ทำการวิจัยและต่อผู้อื่น**

1. ประโยชน์ต่อผู้ป่วย ท่านอาจจะไม่ได้รับประโยชน์โดยตรงแต่ท่านมีส่วนร่วมในการให้ข้อมูลที่เป็นประโยชน์ และเป็นโอกาสที่ท่านจะได้พูดคุย ซักถามเกี่ยวกับการดำเนินของโรค การรักษา การปฏิบัติตัวตลอดจนการรับคำแนะนำที่เป็นประโยชน์ต่อตัวท่านเองอีกด้วย

2. ประโยชน์ต่อบุคลากรทางด้านสุขภาพ ที่จะนำผลการวิจัยด้านการปรับตัวมาวางแผนการให้ความรู้ คำแนะนำแก่ผู้ป่วยและญาติ โดยคำนึงถึงปัจจัยบางประการที่มีอิทธิพลต่อการปรับตัว

3. ผลการวิจัยครั้งนี้จะเกิดประโยชน์ต่อบุคลากรทางด้านสุขภาพ ได้เห็นความสำคัญและตระหนักถึงปัจจัยบางประการที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว เพื่อนำมาเป็นข้อมูลในการประเมินปัญหา การให้การพยาบาล และส่งเสริมให้ผู้ป่วยสามารถปรับตัวต่อความเจ็บป่วยได้อย่างเหมาะสม

4. ผลการวิจัยจะเป็นข้อมูลในการวิจัยเพื่อส่งเสริมการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลวต่อไป

6. **ความเสี่ยงหรือความไม่สบายที่คาดว่าจะเกิดขึ้นกับผู้ยินยอมตนให้ทำการวิจัยในการเข้าร่วมการศึกษาวิจัย**

เนื่องจากการวิจัยครั้งนี้เป็นการศึกษาเชิงบรรยาย มีการเก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม ซึ่งไม่ก่อให้เกิดอันตรายหรือเสี่ยงต่อสุขภาพของท่านแต่อย่างใด และท่านไม่ต้องเสียค่าใช้จ่ายใดๆ ทั้งสิ้น เพียงแต่ท่านอาจจะเสียเวลาในการทำแบบสอบถาม ซึ่งผู้วิจัยได้เตรียมการจัดการกับปัญหาเหล่านี้โดยอธิบายให้ยินยอมให้ทำการวิจัย และผู้วิจัยได้เลือกเวลาที่เหมาะสมสำหรับให้ท่านทำแบบสอบถาม ผู้วิจัยจะเข้าไปเก็บข้อมูลโดยดูคิวที่เริ่มต้นขณะรอแพทย์ตรวจก่อนเวลา 09.00 น. หรือขณะรอรับยาหลังจากที่ตรวจจากแพทย์เรียบร้อยแล้ว ท่านจะไม่พลาดคิวในการฟังเรียกชื่อเข้าพบแพทย์ ในระหว่างที่ตอบแบบสอบถามท่านจะไม่ตอบข้อใดก็ได้ หากรู้สึกอึดใจที่จะตอบ และสามารถหยุดการตอบแบบสอบถามนี้เมื่อใดก็ได้ ท่านจะได้รับการตรวจและรักษาโรคตามวิธีการที่เป็นมาตรฐานและขั้นตอนการรอตรวจต่อไป

7. **การเตรียมผลิตภัณฑ์ หรือกระบวนการรักษาที่พิสูจน์จากการทำวิจัยแล้วว่าปลอดภัย และมีประสิทธิผลไว้ให้ผู้ยินยอมตนให้ทำการวิจัยอย่างไร**

เนื่องจากการวิจัยนี้ เป็นการศึกษาแบบบรรยายและเก็บข้อมูลโดยใช้แบบสอบถาม ซึ่งไม่ก่อให้เกิดอันตรายหรือความเสี่ยงต่อสุขภาพของท่านที่ยินยอมให้ทำการวิจัยโดยการตอบแบบสอบถามแต่อย่างใด

8. **ทางเลือกในการรักษาหรือวิธีการตรวจวินิจฉัยอื่นที่อาจจะเป็นประโยชน์แก่ผู้ยินยอมตนให้ทำการวิจัย**

เนื่องจากการวิจัยนี้ เป็นการศึกษาแบบบรรยายและเก็บข้อมูลโดยใช้แบบสอบถาม ซึ่งไม่ก่อให้เกิดอันตรายหรือความเสี่ยงต่อสุขภาพของท่านที่ยินยอมให้ทำการวิจัยโดยการตอบแบบสอบถามแต่อย่างใด

9. **ขอบเขตการดูแลรักษาความลับของข้อมูลต่างๆ ของผู้ยินยอมตนให้ทำการวิจัย**

ข้อมูลที่ได้จากท่านให้ทำการวิจัยทั้งหมดจะถูกเก็บเป็นความลับและจะไม่เปิดเผยชื่อ-นามสกุลใดๆ ทั้งสิ้น ซึ่งข้อมูลทั้งหมดจะถูกวิเคราะห์และสรุปผลการวิจัยในภาพรวม

10. **การดูแลรักษาที่ผู้วิจัยจะจัดให้**

ขณะที่ท่านทำแบบสอบถามหากพบว่ามีความผิดปกติใดๆ เช่น หน้ามืด ใจสั่น จะเป็นลม เป็นต้น ท่านจะได้รับการดูแลเบื้องต้นโดยนำส่งห้องฉุกเฉิน เพื่อรับการรักษาพยาบาลทันทีและส่งรักษาต่อที่เหมาะสมต่อไป

11. **กรณีเกิดอันตรายหรือผลไม่พึงประสงค์จากการศึกษาวิจัย ผู้ยินยอมตนให้ทำการวิจัยจะได้รับการดูแลรักษาโดยไม่ต้องเสีค่าใช้จ่ายอย่างไรบ้าง**

เนื่องจากการวิจัยนี้ เป็นการศึกษาแบบบรรยายและเก็บข้อมูลโดยใช้แบบสอบถาม ซึ่งไม่ก่อให้เกิดอันตราย หรือความเสี่ยงต่อสุขภาพของท่านที่ยินยอมให้ทำการวิจัย โดยการตอบแบบสอบถามแต่อย่างใด

12. **ในกรณีเกิดอันตรายจากการวิจัยถึงขั้นพิการ หรือเสียชีวิต ผู้ยินยอมตนให้ทำการวิจัยหรือทายาทจะได้รับการชดเชยอย่างไร**

เนื่องจากการวิจัยนี้ เป็นการศึกษาแบบบรรยายและเก็บข้อมูลโดยใช้แบบสอบถาม ซึ่งไม่ก่อให้เกิดอันตรายหรือความเสี่ยงต่อสุขภาพของท่านที่ยินยอมให้ทำการวิจัยโดยการตอบแบบสอบถามแต่อย่างใด

13. **สิทธิผู้ยินยอมตนให้ทำการวิจัยจะถอนตัวออกจากโครงการวิจัยได้ทุกเมื่อ โดยไม่กระทบต่อการดูแลรักษาที่พึงได้รับตามปกติ**

ขณะทำแบบสอบถามเมื่อท่านรู้สึกไม่สบายใจหรือไม่สะดวกที่จะตอบแบบสอบถาม ท่านมีสิทธิ์ที่จะถอนตัวออกจากโครงการวิจัยได้ โดยไม่มีผลกระทบต่อการบริการและการรักษาพยาบาลที่ท่านจะได้รับแต่ประการใด

14. **ชื่อ ที่อยู่ และเบอร์โทรศัพท์ที่ท่านสามารถติดต่อได้โดยสะดวกทั้งในและนอกเวลาราชการกรณีมีเหตุจำเป็นหรือฉุกเฉิน**

ท่านสามารถติดต่อ คุณอรุณประไพ บัวพันธุ์ ที่หมายเลขโทรศัพท์ 084-2055513 ตลอดเวลาเมื่อท่านมีข้อข้องใจเกี่ยวกับโครงการวิจัย

INFORMED CONSENT FORM

ใบยินยอมให้ทำการวิจัย

โดยได้รับการบอกกล่าวและเต็มใจ (Informed Consent Form)

การวิจัยเรื่อง ปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว

วันให้คำยินยอม วันที่.....เดือน.....พ.ศ.....

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียด และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามต่าง ๆ ที่ข้าพเจ้าสงสัยด้วยความเต็มใจ ไม่ปิดบังซ่อนเร้นจนข้าพเจ้าพอใจ

ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ และเข้าร่วมโครงการวิจัยนี้โดยสมัครใจ และการบอกเลิกการเข้าร่วมโครงการวิจัยนี้จะไม่มีผลต่อการรักษาโรคที่ข้าพเจ้าจะพึงได้รับต่อไป

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเฉพาะที่เกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยได้เฉพาะในรูปที่สรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้ากับหน่วยงานต่างๆ ที่เกี่ยวข้องกระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากเกิดอันตรายใด ๆ จากการวิจัยดังกล่าว ข้าพเจ้าจะได้รับการรักษาพยาบาลโดยไม่คิดมูลค่าตามมาตรฐานวิชาชีพ และจะได้รับการชดเชยรายได้ที่สูญเสียไประหว่างการรักษาพยาบาลดังกล่าว ตลอดจนเงินทดแทนความพิการที่อาจเกิดขึ้น

ผู้วิจัยรับรองว่าหากมีข้อมูลเพิ่มเติมที่ส่งผลกระทบต่อการวิจัย ข้าพเจ้าจะได้รับการแจ้งให้ทราบโดยไม่ปิดบังซ่อนเร้น

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีประการ และได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

ลงนาม.....พยาน

ลงนาม.....พยาน

ในกรณีที่ผู้ยินยอมตนให้ทำการวิจัยไม่สามารถอ่านหนังสือได้ จะต้องได้รับการยินยอมในขณะที่ยังมีสติสัมปชัญยะ และระบุข้อความไว้ตามนี้ ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในใบยินยอมนี้ให้แก่ข้าพเจ้าฟังจนเข้าดีแล้ว ข้าพเจ้าจึงลงนามหรือประทับลายนิ้วแม่มือขวา ของข้าพเจ้าในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

ลงนาม.....พยาน

ลงนาม.....พยาน

ในกรณีที่ผู้ถูกทดลองยังไม่บรรลุนิติภาวะจะต้องได้รับการยินยอมจากผู้ปกครองหรือผู้อุปการะโดยชอบด้วยกฎหมาย

ลงนาม.....ผู้ปกครอง/ผู้อุปการะ
โดยชอบด้วยกฎหมาย

ลงนาม.....พยาน

ลงนาม.....พยาน

ในกรณีที่ผู้ถูกทดลองไม่สามารถตัดสินใจเองได้ (เช่น กรณีผู้ที่ยินยอมตนให้ทำการวิจัยอยู่ในภาวะหมดสติ) ให้ผู้แทนโดยชอบด้วยกฎหมายหรือผู้ปกครองหรือญาติที่ใกล้ชิดที่สุดเป็นผู้ลงนามยินยอม

ลงนาม.....ผู้แทน/ผู้ปกครอง/ญาติ

ลงนาม.....พยาน

ลงนาม.....พยาน

APPENDIX C

RESEARCH INSTRUMENTS

คำชี้แจงเรื่องแบบสอบถามสำหรับผู้เข้าร่วมการวิจัย

เรียน ผู้เข้าร่วมการวิจัยทุกท่าน

แบบสอบถามฉบับนี้มีทั้งหมด 10 หน้า จำนวน 3 ส่วน รวม 65 ข้อ ดังต่อไปนี้

ส่วนที่ 1 แบบสอบถามการปรับตัว จำนวน 35 ข้อ

ส่วนที่ 2 แบบสอบถามภาวะซึมเศร้า จำนวน 20 ข้อ

ส่วนที่ 3 แบบสอบถามข้อมูลส่วนบุคคล จำนวน 10 ข้อ

แบบสอบถามชุดดังกล่าว เป็นแบบสอบถามที่ถามเกี่ยวกับข้อมูลของตัวท่าน พฤติกรรมการปรับตัวในด้านร่างกาย จิตใจ บทบาทหน้าที่และการพึ่งพาซึ่งกันและกัน และประสบการณ์ภาวะซึมเศร้าที่เกิดขึ้นกับท่านในช่วงหนึ่งสัปดาหที่ผ่านมา ซึ่งไม่มีคำตอบใดผิดหรือถูก การตอบคำถามของท่านจะเป็นเป็นประโยชน์ต่อบุคลากรทีมสุขภาพ ในการนำข้อมูลไปวางแผนการพยาบาลเพื่อการดูแลผู้ป่วยภาวะหัวใจล้มเหลวต่อไป

ผู้วิจัยขอให้ท่านตอบแบบสอบถามจำนวน 3 ส่วน ตามคำชี้แจงในแต่ละแบบสอบถาม ท่านจะไม่ตอบข้อคำถามข้อใดก็ได้ถ้าท่านรู้สึกลำบากใจ หรือจะหยุดตอบคำถามเมื่อใดก็ได้ตามความสมัครใจ หากท่านมีข้อสังสัยประการใด กรุณาสอบถามจากผู้วิจัยได้โดยตรง ขอขอบคุณที่ท่านสละเวลาในการตอบแบบสอบถาม ณ โอกาสนี้

นางอรุณประไพ บัวพันธุ์

ผู้วิจัย

ลำดับที่….....

วัน / เดือน / ปี.....

เครื่องมือที่ใช้ในการวิจัย

……

เรื่อง ปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว

ส่วนที่ 1 แบบสอบถามการปรับตัว

<u>คำชี้แจง</u> แบบสอบถามนี้แบ่งออกเป็น 2 ตอน คือ

<u>ตอนที่ 1</u> แบบสอบถามการปรับตัวทางด้านร่างกาย 14 ข้อ เป็นข้อคำถามเกี่ยวกับการปฏิบัติตัวของท่านในด้านการปรับตัวตามความต้องการของร่างกาย ในระยะ 1 เดือนที่ผ่านมา โดยให้ท่านอ่านแบบสอบถามและทำเครื่องหมาย $(\surd)$ ลงในช่องที่ตรงกับการปฏิบัติตัวของท่านมากที่สุดเพียงคำตอบเดียว โดยการเลือกตอบให้ถือเกณฑ์ ดังนี้

บ่อยครั้ง หมายถึง ท่านปฏิบัติเป็นประจำ
ค่อนข้างบ่อย หมายถึง ท่านปฏิบัติบ่อยครั้ง
นานๆ ครั้ง หมายถึง ท่านปฏิบัติเป็นบางครั้ง
ไม่เลย / น้อยมาก หมายถึง ท่านปฏิบัติได้น้อยมาก หรือไม่ได้ปฏิบัติเลย

ข้อความ	ไม่เลย / น้อยมาก	นานๆ ครั้ง	ค่อนข้างบ่อย	บ่อยครั้ง
1. ท่านสามารถทำกิจกรรมต่าง ๆ ได้ทุกอย่างโดยไม่ต้องอาศัยผู้อื่น				
2. ท่านสามารถกลับไปทำงานประจำที่เคยทำได้เหมือนเดิมโดยไม่ต้องหยุดงาน ลาพัก หรือลาออกจากงาน				
.....				
14. เมื่อท่านมีอาการผิดปกติเกิดขึ้น เช่น นอนกลางคืนต้องลุก ขึ้นมาเหนื่อยหอบและไอ เริ่มบวมตามข้อเท้า ปัสสาวะออกน้อย กว่าปกติ ท่านไปพบแพทย์แม้จะยังไม่ถึงกำหนดนัด				

<u>ตอนที่ 2</u> ข้อคำถามเกี่ยวกับพฤติกรรม หรือความรู้สึกของท่านที่มีต่อโรค ในด้านความรู้สึกที่มีต่อตนเอง (อัตมโนทัศน์) ด้านบทบาทหน้าที่ และด้านการพึ่งพาซึ่งกันและกัน จำนวน 21 ข้อ โดยให้ท่านอ่านแบบสอบถามและทำเครื่องหมาย (√) ลงในช่องที่ตรงกับพฤติกรรมหรือความรู้สึกของท่านมากที่สุดเพียงคำตอบเดียว โดยการเลือกตอบให้ถือเกณฑ์ ดังนี้

บ่อยครั้ง หมายถึง ท่านปฏิบัติเป็นประจำ
ค่อนข้างบ่อย หมายถึง ท่านปฏิบัติบ่อยครั้ง
นานๆ ครั้ง หมายถึง ท่านปฏิบัติเป็นบางครั้ง
ไม่เลย / น้อยมาก หมายถึง ท่านปฏิบัติได้น้อยมาก หรือไม่ได้ปฏิบัติเลย

ข้อความ	ไม่เลย / น้อยมาก	นานๆ ครั้ง	ค่อนข้าง บ่อย	บ่อย ครั้ง
1.ท่านรู้สึกไม่พอใจในสภาพร่างกายที่เปลี่ยนไปภายหลังการเจ็บป่วย				
2.ท่านรู้สึกว่ารูปลักษณ์หรือร่างกายของตนเองเปลี่ยนไปภายหลังเจ็บป่วย				
3.ท่านรู้สึกว่าสภาพร่างกายของท่านอ่อนแอลงภายหลังการเจ็บป่วย				
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21. ท่านสนใจเรียนรู้ และหาความรู้เกี่ยวกับการเจ็บป่วยของท่านเพื่อดูแลตนเองโดยวิธีต่างๆ				

ส่วนที่ 2 แบบสอบถามภาวะซึมเศร้า

<u>คำชี้แจง</u> โปรดพิจารณาข้อความว่าตรงกับความรู้สึกหรือพฤติกรรมของท่าน ซึ่งอาจเกิดขึ้นกับท่านในรอบ 1 สัปดาห์ที่ผ่านมา ข้อคำถามจำนวน 20 ข้อ ทำเครื่องหมาย (√) ลงในช่องวางที่ตรงกับความรู้สึกหรือพฤติกรรมของท่านมากที่สุดเพียงคำตอบเดียว โดยการเลือกตอบให้ถือเกณฑ์ ดังนี้

ไม่เลย หมายถึง ความรู้สึกหรือเหตุการณ์นั้นเกิดขึ้นน้อยกว่า 1 วันในหนึ่งสัปดาห์
นานๆ ครั้ง หมายถึง ความรู้สึกหรือเหตุการณ์ นั้นเกิดขึ้น 1-2 วัน ในหนึ่งสัปดาห์
ค่อนข้างบ่อย หมายถึง ความรู้สึกหรือเหตุการณ์นั้นเกิดขึ้น 3-4 วัน ในหนึ่งสัปดาห์
บ่อยครั้ง หมายถึง ความรู้สึกหรือเหตุการณ์นั้นเกิดขึ้นน้อย 5-7 วันในหนึ่งสัปดาห์

ข้อความ	ไม่เลย (น้อยกว่า 1 วัน ต่อ สัปดาห์)	นานๆ ครั้ง (1-2 วัน ต่อ สัปดาห์)	ค่อนข้าง บ่อย (3-4 วัน ต่อ สัปดาห์)	บ่อยครั้ง (5-7 วัน ต่อ สัปดาห์)
1.ท่านรู้สึกหงุดหงิดง่าย				
2.ท่านรู้สึกเบื่ออาหาร ไม่อยากกิน อะไร				
3.ท่านรู้สึกว่าท่านมีความทุกข์ใจ ตลอดเวลา ถึงแม้ว่าจะได้รับความ ช่วยเหลือจากครอบครัว ญาติพี่น้อง หรือเพื่อนๆ				
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.....				
20.ท่านรู้สึกท้อแท้ในชีวิต				

ส่วนที่ 3 แบบสอบถามข้อมูลส่วนบุคคล

คำชี้แจง กรุณาทำแบบสอบถามข้อมูลส่วนบุคคลตามข้อคำถามดังต่อไปนี้

1. เพศ ( ) ชาย
   ( ) หญิง

2. อายุ ..... ปี.....เดือน

3. ศาสนา ( ) พุทธ
   ( ) คริสต์
   ( ) อิสลาม
   ( ) อื่น ๆ ระบุ.....

4. สถานภาพสมรส
   ( ) โสด
   ( ) คู่
   ( ) หย่า
   ( ) แยกกันอยู่
   ( ) หม้าย
   ( ) อื่น ๆ ระบุ.....

5. ระดับการศึกษา
   5.1 การศึกษาที่ได้รับสูงสุด
   ( ) ไม่ได้เรียน
   ( ) ประถมศึกษา ระบุ.....
   ( ) มัธยมศึกษา ระบุ.....
   ( ) อนุปริญญา / อาชีวะ
   ( ) ปริญญาตรี
   ( ) สูงกว่าปริญญาตรี
   จำนวนปีที่ได้รับการศึกษา.....ปี

6. อาชีพปัจจุบัน

( ) นักเรียน / นักศึกษา

( ) ทำงานบ้าน

( ) รับจ้าง

( ) ทำสวน / ทำไร่

( ) รับราชการ / รัฐวิสาหกิจ

( ) ค้าขาย

( ) อื่นๆ ระบุลักษณะงานที่ทำ.....

7. รายได้ของผู้ป่วยเฉลี่ยต่อเดือน .....บาท

รายได้ทั้งหมดเพียงพอกับรายจ่ายหรือไม่

( ) เพียงพอทุกเดือน

( ) เพียงพอและมีเหลือเก็บ

( ) ไม่เพียงพอ

8. การสูบบุหรี่

( ) ไม่สูบบุหรี่

( ) ปัจจุบันสูบบุหรี่ .....มวนต่อวัน

( ) เคยสูบบุหรี่ .....มวนต่อวัน หยุดแล้ว ..... ปี

9.การดื่มสุรา (และยาดอง)

( ) ไม่เคยดื่ม

( ) ดื่ม ..... แก้วต่อวัน

( ) เคยดื่ม ..... แก้วต่อวัน หยุดแล้ว ..... ปี

10. ท่านดื่มเครื่องดื่มอื่นๆ

( ) กาแฟ

( ) ชา

( ) เครื่องดื่มชูกำลัง

( ) อาหารเสริม ระบุ.....

( ) สมุนไพร ระบุ.....

ส่วนนี้สำหรับผู้วิจัย

11. โรคระจำตัว (การวินิจฉัยโรคตามบันทึกความก้าวหน้าของโรคตาม progress note)

1……..

2……..

3……

4……

5…….

12.ระยะเวลาในการเจ็บป่วยด้วยโรคหัวใจ (stage B, C) .....ปี.....เดือน

13. ยาที่ใช้ประจำ

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14. ระดับของภาวะหัวใจล้มเหลว (Stage of Heart Failure)

( ) Stage B

( ) Stage C

15. ระดับสมรรถภาพของหัวใจ (New York Heart Association Functional Classification)

( ) Class I

( ) Class II

( ) Class III

( ) Class IV

APPENDIX D

ETHICAL CLEARANCE

No. MU 2007-171

Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to
Human Experimentation
Mahidol University, Bangkok

Title of Project: The Factors Influencing Adaptation of Heart Failure Patients
(Thesis for Master Degree)

Principle Investigator: Mrs. Arunprapai Buapan

Name of Institution: Faculty of Nursing

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: .....
(Professor Dr.Srisin Khusmith)

Signature of Head of the Institute: .....
(Professor Dr.Pornchai Matangkasombut)

Date of Approval: 19 SEP 2007

Date of Expiration: 18 SEP 2008

คณะกรรมการจริยธรรมเพื่อการวิจัยสถาบันโรคทรวงอก

กรมการแพทย์

กระทรวงสาธารณสุข

โครงการวิจัย : ปัจจัยที่มีอิทธิพลต่อการปรับตัวของผู้ป่วยภาวะหัวใจล้มเหลว

ผู้ดำเนินการวิจัย : นางอรุณประไพ บัวพันธุ์

สถานที่ทำการวิจัย : สถาบันโรคทรวงอก

คณะกรรมการจริยธรรมเพื่อการวิจัยสถาบันโรคทรวงอก กรมการแพทย์ กระทรวงสาธารณสุข อนุมัติในแง่จริยธรรมให้ดำเนินการศึกษาวิจัยเรื่องข้างต้นได้

..... ประธานกรรมการ
(นายแพทย์ชูศักดิ์ เกษมศานติ์)

..... กรรมการ
(แพทย์หญิงเปี่ยมลาภ แสงสายัณห์)

APPENDIX E

MORE RESULTS

Table 1 Number and percent of the samples' classified by demographic characteristics (N=109) (continued)

Characteristics	Number	percentage
Religion		
Buddhism	107	98.2
Islam	1	0.9
Christianty	1	0.9
Adequacy of income		
Adequate	50	45.9
Adequate and collected	37	33.9
Inadequate	22	20.2

ตารางที่ 10 ร้อยละ ของผู้ป่วยภาวะหัวใจล้มเหลว เกี่ยวกับการปรับตัวจำแนกตามรายด้าน (n=109)

การปรับตัว	ไม่เลย / น้อยมาก (ร้อยละ)	นานๆ ครั้ง (ร้อยละ)	ค่อนข้างบ่อย (ร้อยละ)	บ่อยครั้ง (ร้อยละ)
1. การปรับตัวด้านร่างกาย				
1. การทำกิจวัตรประจำวันด้วยตนเอง	1.8	10.1	5.5	82.6
2. การทำงานประจำ	25.7	5.5	5.5	63.3
3. การทำงานอดิเรก	0.0	5.5	10.1	84.4
4. การออกกำลังกาย	12.8	24.8	23.9	38.5
5. ความเพียงพอในการพักผ่อนและการนอนหลับ	4.6	18.3	20.2	56.9
6. การงดรับประทานอาหารที่ขัดต่อโรค	2.8	27.5	43.1	26.6
7. การหลีกเลี่ยงอาหารรสเค็ม หรือการเติมเครื่องปรุงรส	7.3	20.2	48.6	23.9
8. การดูแลตนเองไม่ให้ท้องผูก	4.6	12.8	20.2	62.4
9. การจำกัดน้ำดื่ม	57.8	13.8	11.9	16.5
10.การสังเกตผิดปกติ	54.1	13.8	13.8	18.3
11.การจับชีพจรก่อนรับประทานยา	81.7	11.9	1.8	4.6
12.การจับชีพจรเมื่อมีอาการผิดปกติ	79.8	12.8	4.6	2.8
13. การสังเกตอาการข้างเคียงของยาโรคหัวใจ	61.5	12.8	12.8	12.8
14. การพบอาการผิดปกติที่ต้องพบแพทย์ก่อนวันนัด	70.6	10.1	11.1	8.3

ตารางที่ 10 ร้อยละ ของผู้ป่วยภาวะหัวใจล้มเหลว เกี่ยวกับการปรับตัวจำแนกตามรายด้าน (n=109) (ต่อ)

การปรับตัว	ไม่เลย / น้อยมาก (ร้อยละ)	นานๆ ครั้ง (ร้อยละ)	ค่อนข้างบ่อย (ร้อยละ)	บ่อยครั้ง (ร้อยละ)
2. การปรับตัวด้านอัตมโนทัศน์				
1. ความรู้สึกไม่พอใจในร่างกายภายหลังการเจ็บป่วย	8.3	7.3	25.7	58.7
2. ความรู้สึกว่าร่างกายเปลี่ยนไปภายหลังเจ็บป่วย	8.3	7.3	24.8	59.6
3. ความรู้สึกว่าร่างกายอ่อนแอลงภายหลังการ เจ็บป่วย	11.0	25.7	31.2	32.1
4. ความรู้สึกกังวลใจ ว่าอาการรุนแรงขึ้นเรื่อยๆ จนดูแลตนเองไม่ได้	8.3	6.4	28.4	56.9
5. ความรู้สึกว่าการดูแลจากทีมสุขภาพจะทำให้อาการดีขึ้น	4.6	3.7	14.7	77.1
6. ความรู้สึกว่าการเจ็บป่วยเกิดจากเคราะห์กรรม หรือ กรรมเก่า	6.4	10.1	30.3	53.2
7.ความรู้สึกว่าทำกิจกรรมได้เหมือนกับคนอื่น	4.6	9.2	12.8	73.4
8.ความรู้สึกมีคุณค่าและเป็นบุคคลสำคัญของครอบครัว	1.8	0.9	7.3	89.9
9. ความภาคภูมิใจในตนเอง	0.9	2.8	6.4	89.9
10.การดูแลตนเองเพื่อลดและป้องกันอาการกำเริบ	0.00	9.2	48.6	42.2

ตารางที่ 10 ร้อยละ ของผู้ป่วยภาวะหัวใจล้มเหลว เกี่ยวกับการปรับตัวจำแนกตามรายด้าน (n=109) (ต่อ)

การปรับตัว	ไม่เลย / น้อยมาก (ร้อยละ)	นานๆ ครั้ง (ร้อยละ)	ค่อนข้าง บ่อย (ร้อยละ)	บ่อย ครั้ง (ร้อยละ)
3. การปรับตัวด้านบทบาทหน้าที่				
1. การทำหน้าที่ต่างๆในครอบครัว	0.9	7.3	9.2	82.6
2. การให้คำปรึกษาแก่ผู้อื่น	0.00	8.3	20.2	71.6
3. การทำงานประจำ	36.7	6.4	6.4	50.5
4. การเข้าร่วมกิจกรรม หรืองานต่างๆ ในสังคม	18.3	18.3	24.8	38.5
5. การรับประทานยา และมาตรวจตามนัด	1.8	0.9	6.4	90.8
6. การดูแลตนเอง และสังเกตอาการข้างเคียงของยา	1.8	4.6	40.4	53.2
7. การปรึกษาหรือสอบถามปัญหาสุขภาพจากทีมสุขภาพ	1.8	6.4	17.4	74.3

ตารางที่ 10 ร้อยละ ของผู้ป่วยภาวะหัวใจล้มเหลว เกี่ยวกับการปรับตัวจำแนกตามรายด้าน (n=120) (ต่อ)

การปรับตัว	ไม่เลย / น้อยมาก (ร้อยละ)	นานๆ ครั้ง (ร้อยละ)	ค่อนข้าง บ่อย (ร้อยละ)	บ่อย ครั้ง (ร้อยละ)
4. การปรับตัวด้านการพึ่งพาซึ่งกันและกัน				
1. การดูแลตนเองในการทำกิจวัตรประจำวัน	5.5	6.4	4.6	83.5
2. ความรู้สึกว่าต้องพึ่งพาคนอื่นตลอดชีวิต	2.8	5.5	19.3	72.5
3. ความรู้สึกว่าเป็นภาระแก่คนอื่น	16.5	13.8	20.2	49.5
4. การสนใจแสวงหาความรู้เพื่อดูแลตนเอง	2.8	11.0	53.2	33.0

APPENDIX F

TESTING ASSUMPTION OF MULTIPLE REGRESSION ANALYSIS

The data were check before conduction and analysis includinged linearity, multicollinearity, normality, and homoscedasticity. The results for each assumptions were presented as follows;

1. The relationship between x and y must be linear. The residuals were testes for approximately normal distribution. If the distribution of the residual was normal; a standard deviation above the mean; it meant the relationship is linear, and the dependent variable was show as normal distribution (Figure3)

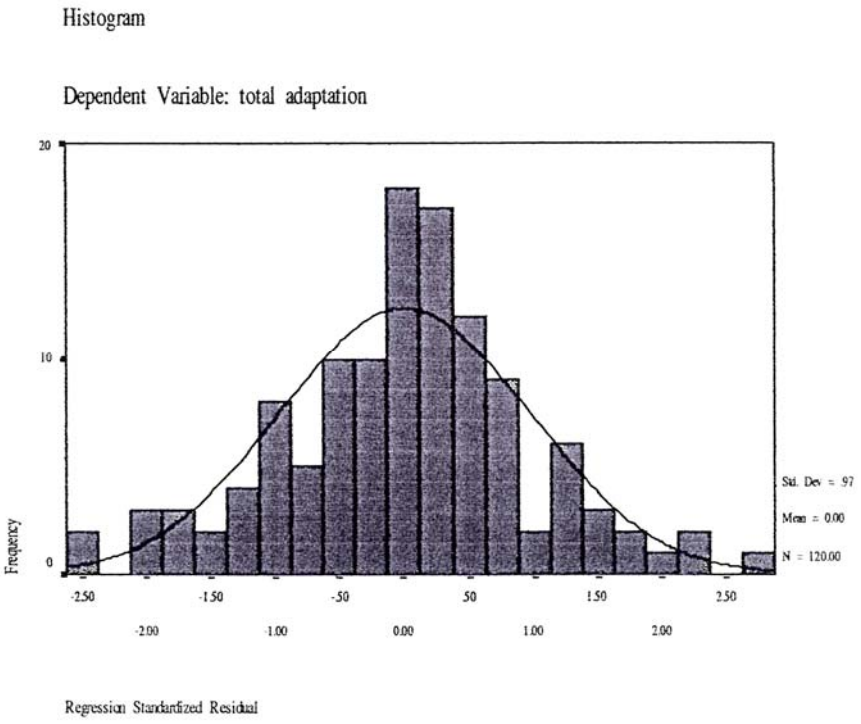

Figure 3 Histogram of residuals

2. Homoscedasticity. The residuals were plotted against the predicted values and against the independent variables. The results were revealed that the actual scores varies around the prediction line. (Figure 4)

Then the residuals from a normal distribution, the plotted values fell close to the line of normal probability. (Figure5)

Partial Regression Plot

Dependent Variable: Adaptation

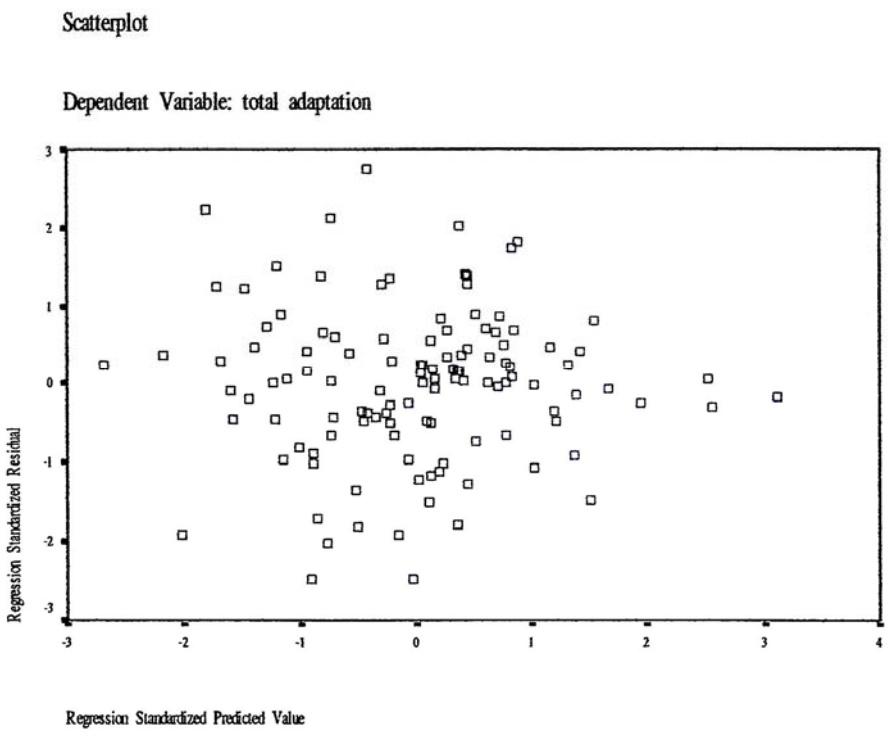

Figure 4 Scatter plot between regression residual and regression predicted value.

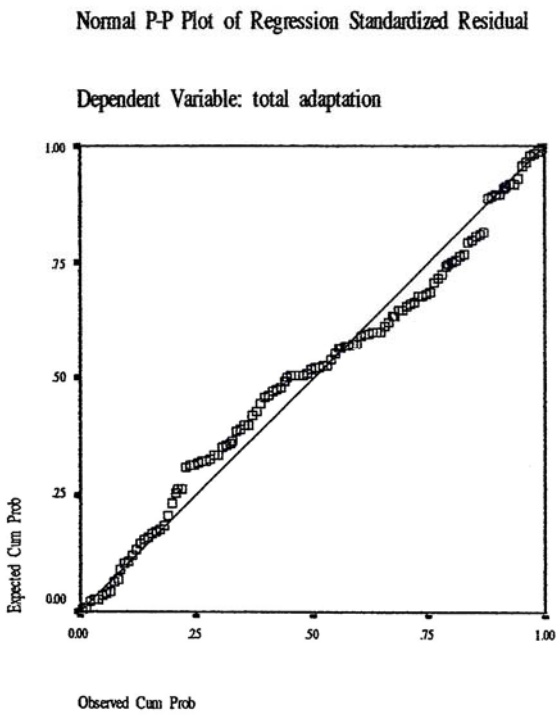

Figure 5 Normal P-P plot of regression standard residual

3. Assessing Multicollinearity

The Peason's Product Moment Correlation was performed to examine the relationship among independent variables. The result of the analysis revealed that the highest correlation coefficient among the variable was not higher than .65 (Burn, & Grove, 1993), Tolerance and Eigenvalues to come near 0 (Pedhazur, 1997), Variance Inflation Factor: VIF was not higher than10 (Pedhazur, 1997), and Condition Index was not higher than 20 (Pedhazur, 1997). The, the issue of Multicolinearity was not concern. As a result, concluded that the data in this study could be test by Multiple Regression Analysis, because the data met all of the assumption required by this method.

Table 9 Unstandardized Coefficients (B), Standard. Error (SE B), Standardized Coefficients (Beta), t-score, and Collinearity of gender, age, status, educational level, income, duration of heart failure, stage of heart failure and depressive symptoms, and constant.

Variables	**B**	**SE B**	**β**	**t**	**sig**	**Collinearity statistics**	
						Tolerance	**VIF**
(Constant)	79.184	6.523	11.956	.000			
Gender	1.787	1.924	.088	.928	.355	.787	1.271
Age	-.116	.064	-.177	-1.808	.074	.737	1.356
Status	.393	2.162	.017	.182	.856	.858	1.166
Education	.425	.197	.203	2.160	.033	.799	1.251
Income	4.103E-05	.000	.205	2.350	.021	.926	1.079
Duration of heart failure	-1.230E-02	.022	-.050	-.557	.579	.896	1.117
Stage of heart Failure	-.638	1.873	-.031	-.341	.734	.846	1.181
Depression	-.602	.126	-.453	-4.762	.000	.781	1.280

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