THE EFFECT OF THE SELF-EFFICACY ENHANCEMENT FOR CARDIAC REHABILITATION PROGRAM ON FUNCTIONAL STATUS IN PERSONS WITH MYOCARDIAL INFARCTION

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ผลของโปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจต่อสภาวะการทำหน้าที่ของผู้เป็นกล้ามเนื้อหัวใจตาย

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นิสากร วิบูลชัย : ผลของโปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจต่อสภาวะการทำหน้าที่ของผู้เป็นกล้ามเนื้อหัวใจตาย. (THE EFFECT OF THE SELF-EFFICACY ENHANCEMENT FOR CARDIAC REHABILITATION PROGRAM ON FUNCTIONAL STATUS IN PERSONS WITH MYOCARDIAL INFARCTION) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. ดร. สุรีพร ธนศิลป์, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ผศ. ดร. สุนิดา ปรีชาวงษ์, 225 หน้า.

การศึกษาวิจัยนี้มีวัตถุประสงค์ เพื่อประเมินผลของโปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจต่อสภาวะการทำหน้าที่ของผู้เป็นกล้ามเนื้อหัวใจตาย การวิจัยนี้ใช้รูปแบบการทดลองที่มีกลุ่มควบคุมและการทดสอบก่อนและหลัง กลุ่มตัวอย่าง คือ ผู้เป็นกล้ามเนื้อหัวใจตายที่ได้รับการรักษาด้วยยาเท่านั้น จำนวน 66 ราย แบ่งเป็นกลุ่มทดลองและกลุ่มควบคุมด้วยวิธีการสุ่มแบบบล๊อค จำนวนกลุ่มละ 33 ราย ผู้ป่วยกลุ่มทดลองเข้าร่วมในโปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจและได้รับการดูแลตามปกติ ขณะที่ผู้ป่วยกลุ่มควบคุมได้รับการดูแลตามปกติ โปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจ มุ่งเน้นการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจ โดยการสนับสนุนจากครอบครัว โปรแกรมนี้ประกอบด้วยองค์ประกอบหลัก 3 องค์ประกอบ ได้แก่ 1) การสร้างแรงจูงใจ; 2) การฝึกทักษะที่จำเป็น; และ 3) การควบคุมติดตามกำกับ โดยเริ่มกิจกรรมตั้งแต่ขณะที่ผู้เป็นกล้ามเนื้อหัวใจตายนอนรักษาตัวอยู่ในโรงพยาบาลและต่อเนื่องช่วง 4 สัปดาห์ภายหลังจำหน่ายออกจากโรงพยาบาล การประเมินสภาวะการทำหน้าที่ของผู้เป็นกล้ามเนื้อหัวใจตายใช้ดัชนีประเมินระดับสมรรถภาพของการมีกิจกรรมประจำวัน โดยประเมินเมื่อก่อนเข้าร่วมโปรแกรมและในสัปดาห์ที่ 4 ภายหลังจำหน่ายออกจากโรงพยาบาล การวิเคราะห์ข้อมูลใช้สถิติ independent t-test and paired t-test

ผลการศึกษาพบว่า กลุ่มทดลองมีสภาวะการทำหน้าที่ดีกว่ากลุ่มควบคุม อย่างมีนัยสำคัญทางสถิติ ($p < .001$) และกลุ่มทดลองมีสภาวะการทำหน้าที่ดีขึ้นภายหลังเข้าร่วมโปรแกรม อย่างมีนัยสำคัญทางสถิติ ($p < .001$) ผลการศึกษาบ่งชี้ว่า โปรแกรมการส่งเสริมสมรรถนะในการฟื้นฟูสภาพหัวใจ เป็นโปรแกรมทางการพยาบาลที่สามารถส่งเสริมสภาวะการทำหน้าที่ของผู้เป็นกล้ามเนื้อหัวใจตายได้

สาขาวิชา พยาบาลศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2556 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม .....

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NISAKORN VIBULCHAI: THE EFFECT OF THE SELF-EFFICACY ENHANCEMENT FOR CARDIAC REHABILITATION PROGRAM ON FUNCTIONAL STATUS IN PERSONS WITH MYOCARDIAL INFARCTION. ADVISOR: ASSOC. PROF. SUREEPORN THANASILP, D.N.S., A.P.N., CO-ADVISOR: ASST. PROF. SUNIDA PREECHAWONG, Ph.D., A.P.N., 225 pp.

The purpose of this study was to examine the effect of the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program) on the functional status of persons with myocardial infarction (MI). This study used a two-group randomized controlled trial with a pretest/posttest design. Sixty-six persons with MI receiving medical therapy, were randomly assigned to either the experimental or control group by using blocked randomization, consisting of 33 participants in each group. The participants in the experimental group participated in the SECR Program and received the usual care during 4 weeks after admission, while those in the control group received the usual care. The SECR Program was designed to enhance self-efficacy for cardiac rehabilitation with support from family members. The program consisted of three components: 1) motivation-building activities in increasing the practices of cardiac rehabilitation; 2) skill training for cardiac rehabilitation; and 3) monitoring of the practices of cardiac rehabilitation. The program activities were conducted during hospitalization and continued for 4 weeks after discharge. Functional status was assessed with the Thai version of the Duke Activity Status Index at baseline and 4 weeks after discharge. An independent t-test and a paired t-test were used for data analysis.

The findings revealed that after participating in the program, the participants in the experimental group had better functional status than those in the control group ($p < .001$). In addition, functional status in the experimental group significantly improved ($p < .001$). These findings indicate that the SECR Program is an effective nursing intervention in promoting the functional status of persons with MI.

Field of Study: Nursing Science
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Student's Signature .....
Advisor's Signature .....
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INTRODUCTION

Background and Significance of the Study

Myocardial infarction (MI), an acute manifestation of coronary artery disease (CAD), is a serious health problem worldwide. Despite the fact that there are no statistics directly related to MI, World Health Organization (2013) has documented that the CAD was the leading cause of death (7 million deaths, or 12.9% of all deaths) and led to the disability-adjusted life-year (DALY) at about 5.8% for the year 2011. In Thailand, the rate of in-patients per population of 100,000 for MI increased from 80.70 in 2009 to 96.68 in 2011, and the death rate per population of 100,000 for CAD in 2011 was high, representing 31.70% of the causes of death related to cardiovascular diseases (Bureau of Policy and Strategy, 2013).

In recent years the rates of death attributable to MI have declined, but the burden of disease remains high (Go et al., 2014). Empirical evidence has documented that a large number of persons that experience an MI fail to return to normal functioning during the early recovery period. Rather, they often experience a decline in functional status (Brink, Brandstrom, Cliffordsson, Herlitz, & Karlson, 2008; Hawkes et al., 2013; Jui-Hua, 2010; Rančić, Petrović, Apostolović, Kocić, & Ilić, 2013).

Functional status is identified as an important clinical outcome for persons with MI, and it is highly predictive of future mortality and hospitalization (McAuley, Myers, Abella, & Froelicher, 2006; Shaw et al., 2006). Functional status is defined as “a multidimensional concept characterizing one’s ability to provide for the necessities of life; that is those activities people do in the normal course of their

lives to meet basic needs, fulfill usual roles, and maintain their health and well-being" (Leidy, 1994a). Those activities have been frequently referred to as daily activities that can be classified into three types: basic, instrumental, and advanced activities of daily living [ADL] (Leidy, 1994a; Leidy & Knebel, 2010; Richmond, Tang, Tulman, Fawcett, & McCorkle, 2004; Wang, 2004), and are chosen by the individual based on personal preference (Leidy, 1994a).

A number of studies point out that the first month after discharge is a critical period, when persons having had an MI return to their previous functional status; that is, they return to the ability to perform usual daily activities (Daly et al., 2000; Johnson, 1991; Sriprasong et al., 2009; Sutherland & Jensen, 2000). In Thailand, most persons with MI that receive medical therapy experience a decline in functional status during the first month after discharge; they usually perform light basic activities of daily living such as sitting, reading, sleeping, and watching television (Sriprasong et al., 2009). However, they do not perform, or spend less time in performing, such specific advance activities as exercise, housework, sexual activity, and social and role functioning (Juntawise, 1996; Sriprasong et al., 2009; Tumnong, 1998). Previous studies have revealed that 44-87% of persons with MI rarely exercised (Kewcharoenta, Panuthai, Phumvitchuvate, & Kuanprasert, 2004; Lortrakul, 2000; Sriprasong, 2008). Moreover, Sriprasong (2008) found that most persons with MI often took only short walks around their houses and about 52-56% of those did not perform household-related instrumental activities at a daily living level and half of those individuals that had been previously involved in sexual activities did not resume this activity because of health concerns, while 16% resumed it with some difficulty. The resumption of sexual activity was often delayed for an average of 3-6

months. In addition, the suffering involved in cardiovascular illness affected the return to work in those previously working. That is, 33% did not return to work at all and 19% went back to work with difficulty. However, previous studies found in some cases that individuals often attempted to resume these activities, but they often gave up due to symptom occurrence from strenuous physical efforts, isometric exercise, and/or experiencing intense anger (Phonphet, 2001; Sindhu & Sriprasong, 2001).

The declines seen in functional status in persons with MI seem to worsen in cardiac recovery, and impacts health and well-being in the long term. This leads to physical deconditioning, often producing more fatigue, more time to dwell on symptoms or bodily sensations, and therefore generates further anxiety (Thompson & Lewin, 2000) and sometimes even post-traumatic stress disorder (Jui-Hua, 2010). Some persons become trapped in a downward spiral of increasing disability (Thompson & Lewin, 2000). Moreover, the decline in functional status is associated with increased risks of 1-year mortality and readmissions with such severe symptoms as angina (Spertus, Jones, McDonell, Fan, & Fihn, 2002) and depression (Katon, 2011). In one study conducted in Thailand, it was found that 86.7% of persons with MI were at risk of having deconditioning effects in the sixth week after discharge as a result of light energy expenditure (Sindhu & Sriprasong, 2001).

Different factors contribute to a decline in functional status; however, a number of studies have confirmed that self-efficacy is a significant predictor or mediator of functional status in persons with MI and that a strong positive relationship between self-efficacy and functional status evidently exists (Allahverdipour, AsghariJafarabadi, Heshmati, & Hashemiparast, 2013; Brink, Alsen,

Herlitz, Kjellgren, & Cliffordson, 2012; O'Neil, Berk, Davis, & Stafford, 2013; Sarkar, Ali, & Whooley, 2007; Sullivan, LaCroix, Russo, & Katon, 1998). That means those persons who have low self-efficacy in terms of engaging in daily activities tend to participate less in such activities, resulting in a decline in functional status. Self-efficacy refers to the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, P.3). Self-efficacy is the primary determinate of behavior, the effort to be expended, and the extent of persistence in the face of adversity (Bandura, 1997). In addition, self-efficacy plays a crucial role in an individual's illness beliefs. Those persons with MI that have low self-efficacy tend to perceive their illness as negative, and to experience serious consequences in their lives, a chronic timeline, and loss of control, which foster anxiety, stress, depression, and a narrow vision of the best approach to solving the problem (Lau-Walker, 2004, 2007). These impacts lead the persons with MI to a decline in functional status, increased disability, and cardiac complaints (de Jonge, Spijkerman, van den Brink, & Ormel, 2006).

Not only does self-efficacy strongly influence functional status among the persons with MI, but such environmental factors as family support also play an important role in influencing functional status. A number of studies have provided evidence that family support has a positive influence on the adoption and maintenance of health behaviors related to functional status (Khuwatsamrit et al., 2006; Shin, Hwang, Jeong, & Lee, 2013). Additionally, family support is confirmed to be a determinant in encouraging in and reinforcing daily activity performance through self-efficacy (Anderson, Wojcik, Winett, & Williams, 2006; McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003; McNeill, Wyrwich, Brownson, Clark, & Kreuter, 2006

Resnick, Orwig, Magaziner, & Wynne, 2002). Thus, person with greater family support tend to show greater self-efficacy in increasing their participation in daily activities. In contrast, poor family support is associated with adverse health behavior. A systematic review of 20 studies by Dalteg, Benzein, Fridlund, and Malm (2011) documented that poor family support is related to overprotectiveness from family members. Most family members are usually overprotective of persons with MI during the early recovery period due to concern about a recurrent cardiac event. Overprotectiveness from family members leads persons with MI to poor functional status in terms of dependency (Clarke, Walker, & Cuddy, 1996; Riegel & Dracup, 1992a, 1992b; Sindhu & Sriprasong, 2001; Tziallas & Tziallas, 2010). In addition, the perceived overprotection of cardiac patients is also associated with concurrent levels of anxiety and depression, and functional status decline (Joekes, Van Elderen, & Schreurs, 2007). Therefore, considering both factors (self-efficacy and family support) is needed for developing nursing interventions to improve the functional status of persons with MI.

Traditionally, in Thailand, persons with MI always receive most of their daily essential demands and the cardiac rehabilitation programs during hospitalization from nursing personnel; however, the cardiac rehabilitation programs commonly focus on the physical and/or medical regimen in the cardiac rehabilitation guideline, and the care during the first month after discharge also places emphasis on providing the necessary health information; much less attention is paid to how to enhance self-efficacy concerning the engagement in behaviors designed to increase the ability to resume normal daily activities after being discharged on the part of persons that have experience an MI, and how family members can collaborate to support them in

order to maximize their self-efficacy. This means that persons with MI play the role of being passive recipients of care, which affects their confidence about resuming usual daily activities. As a consequence, persons with MI receiving conventional care tend to experience a functional status decline after discharge (Ashton, Panuthai, & Choowattanapakorn, 2008; Dakhunthod, 2006).

To date in Thailand, a number of studies about cardiac rehabilitation programs have shifted their focus to psychosocial factors in order to enable the persons with cardiac disease to change their behavior in terms of practicing for cardiac rehabilitation (Ashton et al., 2008; Dakhunthod, 2006; Intarakamhang & Intarakamhang, 2013). However, there still have not been enough studies to allow for the evaluation of self-efficacy enhancement for cardiac rehabilitation to improve functional status during the first month after discharge of persons with MI. Therefore, it is important to develop a Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program), and to examine whether improvement in self-efficacy can lead to the improvement in functional status.

The SECR Program was designed to promote the practice of cardiac rehabilitation during the first month after discharge of persons with MI based on the Cardiac Rehabilitation Guideline 2010 (The Heart Association of Thailand under the Royal Patronage of H.M. the King, 2010), and existing knowledge about cardiac rehabilitation (Ainsworth et al., 2000; Balady et al., 2007; Goble & Worcester, 1999). The SECR Program addressed self-efficacy enhancement for cardiac rehabilitation in persons with MI through the use of four major sources of information (i.e., enactive mastery experience, vicarious experience, verbal persuasion, and reinterpretation of symptoms [physiological and emotional states] (Bandura, 1986, 1997), and having the

collaboration of family members to provide support for each person with MI based on the social support concept proposed by House (1981). A nurse researcher acted as educator, counselor, facilitator, and supervisor of persons with MI.

It is expected that the persons with MI that participate in the SECR Program will have better functional status than those that receive the usual care and booklet. Improving functional status could prevent further health deterioration and reduce re-admission, morbidity, and mortality. It is hypothesized that the quality of life and well-being of the persons with MI will also be improved.

Research Question

How does the Self-efficacy Enhancement for Cardiac Rehabilitation Program improve functional status in persons with MI?

Research Objective

The objective of this study is to determine the effect of the Self-efficacy Enhancement for Cardiac Rehabilitation Program on the functional status of persons with MI.

Theoretical Framework

In this study, the development of an intervention called the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program) was based on social cognitive theory [SCT] (Bandura, 1986, 1997) and social support concept (House, 1981). The SCT was selected to provide a comprehensive analysis of the determinants of behavior change, and to form a basis for developing an intervention to enhance the self-efficacy for cardiac rehabilitation of persons with MI. The social

support concept was selected to explain the kinds of family support used in this study.

Social cognitive theory

In this theoretical perspective, "human behavior is viewed as the product of a dynamic interplay of personal, behavioral, and environmental influences" (Bandura, 1986, 1997). Self-efficacy represents the cognitive aspect of the personal factors relevant to the self-regulation of human capacity. Self-efficacy is the primary determinate of behavior, the effort to be expended, and the extent of persistence in the face of adversity (Bandura, 1997). Self-efficacy affects the daily activities of persons with MI through cognitive function. There is a direct relationship between low self-efficacy and daily activities in persons with MI (Allahverdipour et al., 2013; Brink et al., 2012; O'Neil et al., 2013; Sarkar et al., 2007; Sullivan et al., 1998). In addition, persons with MI that have low self-efficacy tend to perceive their illness as negative, and to experience serious consequences in their lives, a chronic timeline, and loss of control (Lau-Walker, 2004, 2007). This perception causes persons with MI to suffer more from high levels of anxiety (de Jonge et al., 2006).

Judgments of self-efficacy, whether accurate or faulty, are based on four major sources of information (Bandura, 1997). First, enactive mastery experience provides the most influential source of efficacy information because the individual directly engages in the task. Second, vicarious experience enhances the observers' belief about their own capabilities as they appreciate or value the accomplishment of another individual in their peer group through perseverance and determination. Third, verbal persuasion occurs and becomes influential after the exposure of the individual to the verbal judgments of others about their ability to perform. This

influence is commonly used in combination with other sources. Finally, physiological and emotional states or physiologic feedback constitute the fourth source of efficacy information. People with skills to reduce aversive physiological reactions will evaluate their self-efficacy as higher.

In this study, these four major sources of information were used as strategies to achieve greater self-efficacy for cardiac rehabilitation. The activities used in those strategies came from a systemic review of self-efficacy interventions by Hiltunen et al. (2005) and a broader literature review. The definitions used in this study for participant achievements are as follows:

Enactive mastery experience is defined as learning self-efficacy through personal experience or actual performance accomplishments. The nursing activities include: 1) assisting with specific short- and long-term goal setting; 2) providing skill training about a) activity prescription, b) chest pain management, and c) self-recording and evaluation in a diary; 3) using a diary to monitor the progress of the walking exercise and performance of daily activities; 4) discussion about the practices for cardiac rehabilitation currently performed; and 5) giving feedback for achieving short-term goals.

Vicarious experience is defined as raising and strengthening perceived self-efficacy by observing and/or sharing the performances of similar others. The person with MI was exposed to others similar to himself/herself that have successfully recovered. This exposure involved observing a role model.

Verbal persuasion is defined as any verbal persuasive information conveyed to an MI individual by the researcher or family members. The nursing activities include: 1) providing individual health education about MI, walking exercise and

performance of daily activities, healthy eating, risk-factor modification, symptom management, & medication taking; 2) identifying strategies on how to achieve goals; 3) providing guidance to reduce barriers of practices; 4) reviewing expected progress based on short- and long-term goals; 5) focusing on progress; and 6) giving verbal support and encouragement, "cheerleading."

Reinterpretation of symptoms (physiological and emotional states) is defined as learning to realistically judge one's physical or emotional state and the ability to reach goals. The nursing activities included: 1) encouraging the participant to reduce stressors through stress management techniques; 2) promoting the sharing of symptom experiences of persons with MI; 3) helping to reframe symptoms and explanation how they may be a part of the recovery process; and 4) correcting false or unrealistic expectations and interpretations.

Social support concept

Not only do personal factors have a potential influence on behavioral change, social influences within the environment play an influential role in cognitive development. Social support is viewed as social influence, which is defined as a valuable resource comprising tangible and intangible forms of assistance that individuals receive from others [e.g., family, friends, coworkers] (House, 1981; House, Landis, & Umberson, 1988; House, Kahn, McLeod, & Williams, 1985; Tang, 2008). Social support has important causal effects on health and exposure to stress (House, 1981). Positive social support promotes and maintains physical and mental health, and especially buffers or ameliorates the potential deleterious effects of psychosocial stress on health (House, 1987). Social support reduces the effects of stressful life events on health through, either the supportive action of others (e.g.,

advice, reassurance) or the belief that support is available. Supportive actions are thought to enhance coping performance, while perceptions of available support lead to appraising potentially-threatening situations as less stressful (Lakey & Cohen, 2000).

Social support comprises four types of support (House, 1981). Emotional support is associated with sharing life experiences. It involves the provision of empathy, love, trust, and caring. Appraisal support involves the provision of information that is useful for self-evaluation purposes: constructive feedback, affirmation, and social comparison. Informational support involves the provision of advice, suggestions, and information that a person can use to address problems. Instrumental support involves the provision of tangible aids and services that directly assist a person in need.

A number of studies confirm that family support is positively associated with increased levels of participation in daily activities through self-efficacy (Anderson et al., 2006; McAuley et al., 2003; McNeill et al., 2006 Resnick, Orwig, Magaziner, & Wynne, 2002). Self-efficacy plays a mediating role in social support in relation to health behavior (Benight & Bandura, 2004). That is, the relationship between cognitive factors (i.e., self-efficacy) and environmental factors (i.e., social support) shapes people's actions or behaviors. Therefore, in this study, family support for the persons with MI was integrated into the program, along with the four major sources of information, in order to achieve the maximum self-efficacy enhancement for cardiac rehabilitation. Family members, in particular significant caregivers in a family, were involved in the program by providing emotional, appraisal, informational, and instrumental support based on the social support concept of House (1981). This

concept was employed in the construction of the specific nursing activities for promoting family support in the present study as follows.

1) Emotional support: 1) encourage family members to engage with persons with MI in all of the activities of self-efficacy learning; 2) encourage family members to give positive verbal support and encouragement, "cheerleading," to persons with MI;

2) Information support: discuss how to provide informational support for persons with MI at home;

3) Appraisal support: train individuals in how to validate and provide feedback on the practices of persons with MI at home;

4) Instrumental support: discuss how to provide instrumental support for persons with MI at home.

All of these activities that were derived from the self-efficacy theory (Bandura, 1986, 1997) and social support concept (House, 1981) were used to build the structure of the SECR Program, which consisted of three components: 1) motivation-building activities in increasing the practices of cardiac rehabilitation; 2) skill training for cardiac rehabilitation; and 3) monitoring of the practices of cardiac rehabilitation. The details of activities for each component of the SECR Program are presented in Figure 1.

Functional status

In this study, functional status was considered as a dependent outcome variable and was defined as "an MI individual's ability to perform necessary daily activities in the normal course of his/her life to meet basic needs, fulfill usual roles, and maintain health and well-being." Such activities include basic, instrumental, and

advanced ADL. This definition was based on the assumption that each person has the ability to function, and this ability can be measured through capacity in term of the physical maximum potential to perform necessary daily activities. Therefore, functional status was measured using the Thai version of the Duke Activity Status Index (DASI-T) translated from the Duke Activity Status Index [DASI] (Hlatky et al., 1989).

The linkage between self-efficacy, social support, and functional status

According to an extensive literature review, self-efficacy and family support were found to be the most important psychosocial variables for improving functional status. The present study attempts to build upon these findings by integrating these two variables into the cardiac rehabilitation program and examining their effectiveness in relation to functional status outcome. The following visual demonstrates the conceptual framework of this study.

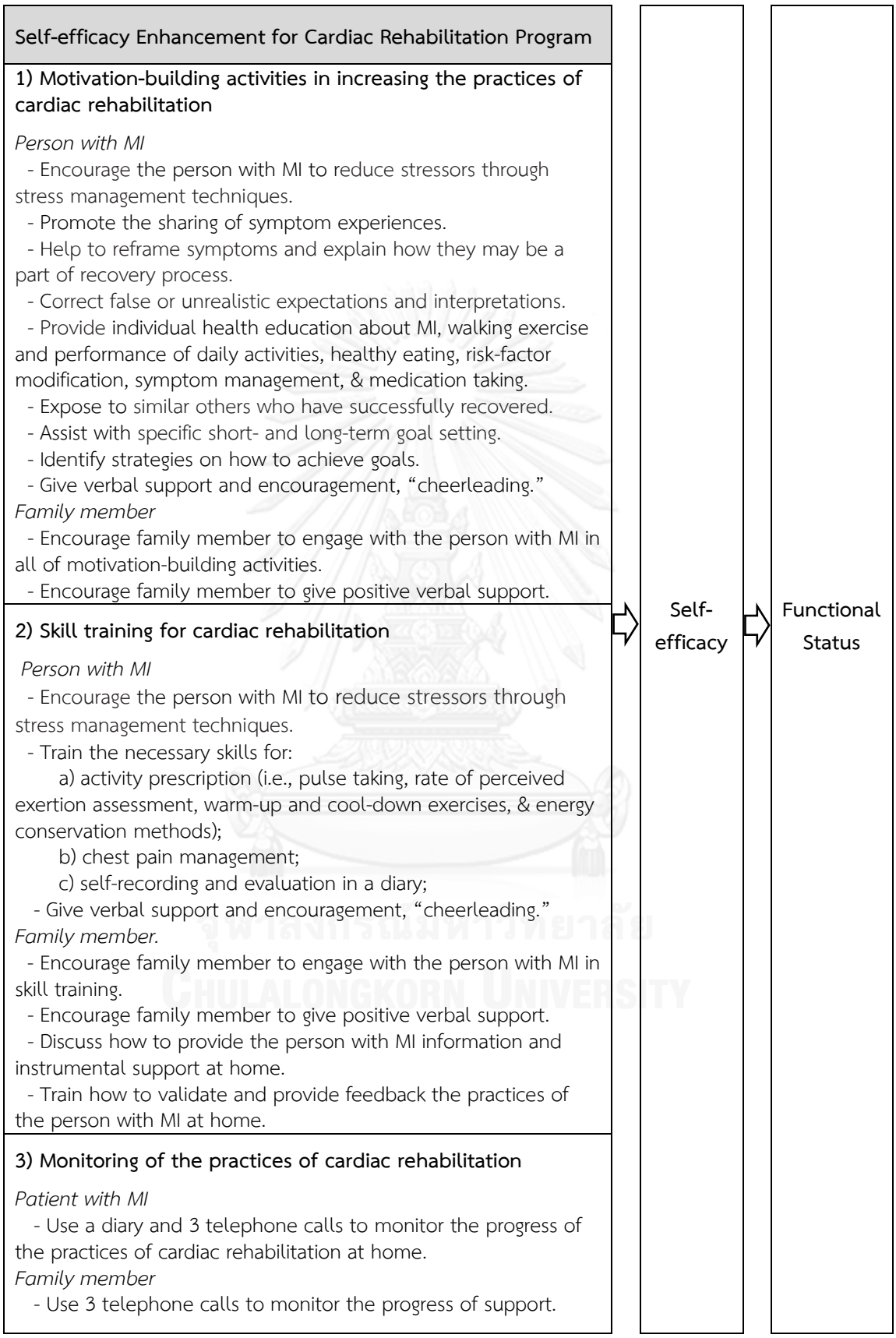

Figure 1 Conceptual framework

Research Hypotheses and Rationales

Since a large number of persons with MI had a decline in functional status during the first month after discharge, a continuing question from a nursing perspective is how to best assist those persons to improve their functional status. The SECR Program is a nursing intervention developed with the aim of improving functional status in persons with MI through self-efficacy enhancement for cardiac rehabilitation and having support from family members in order to help them achieve the maximum self-efficacy. Self-efficacy beliefs can develop human functioning through psychological function (Bandura, 1997). The self-efficacy of the participants in the SECR Program will be enhanced their self-efficacy through four major sources of information based on self-efficacy theory (Bandura, 1986, 1997). These four major sources of information can support optimal motivation to a sense of control over one's environment and behavior. The participants will then begin to believe more in their ability to initiate change, determine whether to increase their practices for cardiac rehabilitation, how much effort they are willing to expend, and understand how long it will be sustained in the face of obstacles and failures. In addition, these four major sources of information will influence each individual in terms of pursuing challenging goals and coping better when confronted with obstacles. With respect to cognitive functioning, the participants that have high self-efficacy will be expected to participate at higher levels in challenging their practices for cardiac rehabilitation.

Consistent evidence across numerous studies indicates the social cognitive theory is a useful framework for nursing intervention in persons with MI. By improving the level of self-efficacy for cardiac rehabilitation, those persons can improve their

performance of walking exercise (Song, 2003; Sullivan et al., 1998) and daily activities (Carlson et al., 2001; Jackson, Leclerc, Erskine, & Linden, 2005; Song, 2003). In addition, family support plays an important role in cognitive development which can convey information and activate emotional reactions through such activities as modeling, instruction, and social persuasion (Bandura, 1997). Moreover, previous studies reported that social support and self-efficacy were highly correlated and that self-efficacy mediated social support and subsequent physical activity behavior (McAuley et al., 2003). Therefore, with support from family members, persons with MI will have a stronger belief in their capabilities and will have greater participation in the practice of cardiac rehabilitation.

In conclusion, the participants in the SECR Program will experience greater self-efficacy regarding cardiac rehabilitation. At the same time, their functional status will improve. The hypotheses of this study are as follows.

1. Participants in the experimental group will have better functional status than participants in the control group.

2. After participating in the SECR Program, the participants in the experimental group will have better functional status than before participating in the program.

Scope of the Study

This study was conducted specifically with Thai persons with MI that received only medical therapy, and were classified as low risk persons with MI based on the recommendation of the American Association of Cardiovascular and Pulmonary Rehabilitation (AACPR) (2012), including no complex dysrhythmias, uncomplicated cardiac events, or absence of clinical depression. Persons with MI were recruited from

the medical wards at Maha Sarakham Hospital, Maha Sarakham Province, in the northeastern region of Thailand from June to October 2013.

Operational Definition

1. **Self-efficacy Enhancement for Cardiac Rehabilitation Program** refers to a physiopsychosocial nursing intervention designed to improve functional status during the first month after discharge in persons with MI that receive medical therapy through enhancing self-efficacy for cardiac rehabilitation constructed from four major sources of information (i.e., enactive mastery experience, vicarious experience, verbal persuasion, and reinterpretation of symptoms) and having the collaboration of family members for support (i.e., emotional, appraisal, informational, and instrumental).

2. **Functional status** is defined as an MI individual's ability to perform necessary daily activities in the normal course of his/her life to meet basic needs, fulfill usual roles, and maintain his or her health and well-being. The daily activities include basic, instrumental, and advanced ADLs. Functional status was measured using the Thai version of the Duke Activity Status Index (DASI-T) translated from the Duke Activity Status Index [DASI] (Hlatky et al., 1989).

3**. Family member** refers to the family caregiver that has major responsibility for taking care of a person with MI.

4. **Usual care** refers to the conventional nursing activities of persons with MI which consist of: 1) cardiac rehabilitation during hospitalization, including medical evaluation and care, structured exercise and performance of daily activities, and individual health education; 2) providing group and individual health education on the follow-up day in the medical out-patient department.

5. **Person with MI** refers to the person that is diagnosed either with an ST-elevated MI (STEMI) or a non ST-elevated MI (NSTEMI) that is receiving only medical therapy and is classified as a low risk person with MI based on the recommendation of the AACPR (2012), including no complex dysrhythmias, uncomplicated cardiac event, or absence of clinical depression.

Expected Usefulness of the Study

The findings of this study will provide greater knowledge and understanding about the effectiveness of the Self-efficacy Enhancement for Cardiac Rehabilitation Program in relation to the functional status of persons with MI. This program is a physiopsychosocial nursing intervention which, if proven efficacious, could be used as a nursing practice guideline to improve the functional status of persons with MI receiving medical therapy. In addition, it could be used for nursing administrators in providing directions for policy setting of nursing care. Moreover, the activities of interventions used in this study can foster the relationships between persons with MI and nurses, and can assist the persons with MI in better understanding their role in improving their knowledge and skill practices for improving their functional status. This in turn can lead to positive short-term and long-term outcomes for both nurses and persons with MI, as well as potentially decrease the cost of related treatment and care.

CHAPTER II
LITERATURE REVIEW

A critical review of the existing literature in this study includes theories and empirical studies. The review is divided into seven parts as follows.

1. Overview of myocardial infarction
2. Functional status
    2.1 Definition of functional status
    2.2 Functional status of persons with myocardial infarction
    2.3 Factors related to functional status
    2.4 Measurement of functional status
3. Social cognitive theory
4. Social support concept
5. Cardiac rehabilitation
6. Existing intervention for improving functional status
7. Development of the Self-efficacy Enhancement for Cardiac Rehabilitation Program

Overview of Myocardial Infarction

Myocardial infarction (MI) or acute myocardial infarction (AMI), commonly known as a heart attack, is a major cause of death and disability worldwide (Beaglehole, Irwin, & Prentice, 2004). Myocardial infarction is myocardial cell death due to prolonged ischemia, which is most often caused by plaque of cholesterol rupture with thrombus formation in a coronary vessel, resulting in an acute reduction of blood supply to a portion of the myocardium. If blood flow is not restored to the

heart muscle within 20 to 40 minutes, irreversible death (infarction) of the heart muscle (myocardium) will begin to occur. Heart muscle tissue continues to die for six to eight hours at which time the myocardial infarction usually is “complete.” The dead heart muscle is eventually replaced by scar tissue.

Important risk-factors are previous cardiovascular disease, old age, tobacco smoking, high blood levels of certain lipids (triglycerides, low-density lipoprotein) and low levels of high density lipoprotein (HDL), diabetes, high blood pressure, obesity, chronic kidney disease, heart failure, excessive alcohol consumption, the abuse of certain drugs (i.e., cocaine, methamphetamine), and chronic high stress levels (Mallinson, 2010)

A classical symptom of acute MI is sudden chest pain (typically radiating to the left arm or left side of the neck). Additionally, patients with MI may experience a variety of symptoms including shortness of breath, nausea, vomiting and/or general epigastric (upper middle abdomen) discomfort, sweating, heartburn and/or indigestion, jaw pain, toothache, headache, arm pain (more commonly the left arm, but may be either arm), upper back pain, general malaise (vague feeling of illness), and even no symptoms (approximately one quarter of all MI is silent, which is especially common among patients with diabetes mellitus) (Kosuge et al., 2006; Mallinson, 2010).

Among the diagnostic tests available to detect heart muscle damage are an electrocardiogram (ECG), echocardiography, and various blood tests. The most often used markers are the ECG and cardiac enzymes, which are the creatine kinase-MB (CK-MB) fraction and the troponin levels. Patients with ischemic discomfort may or may not have ST-segment or T-wave changes denoted on the ECG. ST elevations

seen on the ECG reflect active and ongoing transmural myocardial injury. Without immediate reperfusion therapy, most persons with ST-segment elevation myocardial infarction (STEMI) develop Q waves, reflecting a dead zone of myocardium that has undergone irreversible damage and death. Those without ST elevations are diagnosed either with unstable angina or non–ST-segment elevation myocardial infarction (NSTEMI) differentiated by the presence of cardiac enzymes. Both these conditions may or may not have changes on the surface ECG, including ST-segment depression or T-wave morphological changes (Erhardt et al., 2004; Mallinson, 2010). Immediate treatment for suspected acute MI includes oxygen, aspirin, and sublingual nitroglycerin (Erhardt et al., 2004). Most cases of STEMI are treated with thrombolysis or percutaneous coronary intervention (PCI). NSTEMI should be managed with medication, although PCI is often performed during hospital admission. In people who have multiple blockages and who are relatively stable, or in a few emergency cases, bypass surgery may be an option (Mallinson, 2010).

Functional Status

1. Current usage of the concept

Many sources have been included for the current usage of the concept, functional status, including dictionaries and the published literature across health disciplines. Regarding the dictionary definitions, the term "*functional status*" does not appear as a unit in dictionaries. However, the individual words functional and status can be analyzed. In the Merriam-Webster online dictionary (2014), the term *functional* is the adjective term of function. The meanings of function that are relevant to human are as follows: 1) the action for which a person is specially fitted

or used or for which a thing exists; and 2) any of a group of related actions contributing to a larger action; *especially***:** the normal and specific contribution of a bodily part to the economy of a living organism. The term *status* means: 1) position or rank in relation to others; 2) the condition of a person or thing in the eyes of the law; and 3) state or condition with respect to circumstances. In combining the definition of the terms *function* and *status* related to the background and significance of this study, functional status can be viewed as the condition of the action or performance of a person.

Regarding the usage of the functional status concept in the published literature across health disciplines, the term *functional status* is often used interchangeably with the term *functional ability* (Knight, 2000), and also often refers to the performance of social roles and valued activities (Patrick & Chiang, 2000). Historically, functional status assessment originated in rehabilitation practice for the purpose of determining capacity in relation to expected performance. Assessment scales developed to operationalize functional status are used primarily to assess basic activity performance of daily living to determine disability and facilitate clinical management (Wang, 2004).

Chuang et al. (2003) defined *functional status* as "individual's ability to perform activity in six basic activities of daily living (ADL) including bathing, dressing, toileting, transferring, continence, and feeding." Similar definitions are given by Susan (1999), as "ability to manage daily routines, which have the level or degree of performance such as ADL and IADL (instrumental ADL) which are more complex tasks requiring a combination of physical and mental function such as using the telephone, preparing meals, arranging transportation, managing finances." Additionally, Knight

(2000) and Elisabeth, Gunnar, Palmi V, and Bucht (2007) also defined *functional status* as "individual's ability to perform basic activities of daily living (BADL) that is the combination of functional mobility (FM) and personal care (PC) activities and the ability to perform instrument activities of daily living (IADL), which has two domains: cognitive-IADL (CIADL), such as managing money and medications, and physical-IADL (PIADL), such as changing bed linens and removing garbage." They noted that functional status had both cognitive and instrument component. The ability to perform instrumental activities of daily living must include 'knowing what to do' as these activities require choosing attending and problem solving.

Besides the definition involved activities of daily living and the level of performance, there are more comprehensive definitions of functional status as follows:

Reuben and Solomon (1989) defined *functional status* as "a patient's ability to complete functional tasks and fulfill social roles." Functional tasks range from the simplest self-care to executive-level occupational responsibilities. According to difficulty and complexity of these tasks, Reuben and Solomon (1989) classify functional status into three levels: basic, instrumental and advanced ADL. Basic ADL include the element functions of self-care, while instrumental ADL are the tasks essential to maintaining independence. Advance ADL tend to be volitional, specific to the individual and influenced by cultural and motivational forces with are related to recreational, occupational, altruistic, or community service functions.

WONCA Classification Committee (1990) stated that function refers to the ability of a person to cope with and adapt to the changing elements in his or her individual environment, and to perform certain tasks to a measurable degree.

Functional status is an aspect of health that, in turn, is an aspect of quality of life. Three domains in functional status are: physical, mental and social. Sometime social functioning is a separate domain or a 'confounding factor' that influences physical and mental functioning.

Leidy (1994a) defined *functional status* as "a multidimensional concept characterizing one's ability to provide for the necessities of life; that is those activities people do in the normal course of their lives to meet basic needs, fulfill usual roles, and maintain their health and well-being." Necessities include physical, psychological, social, and spiritual needs that are socially influenced and individually determined. There are four discrete dimensions of functional status: capacity, performance, reserve, and capacity utilization (Figure 2).

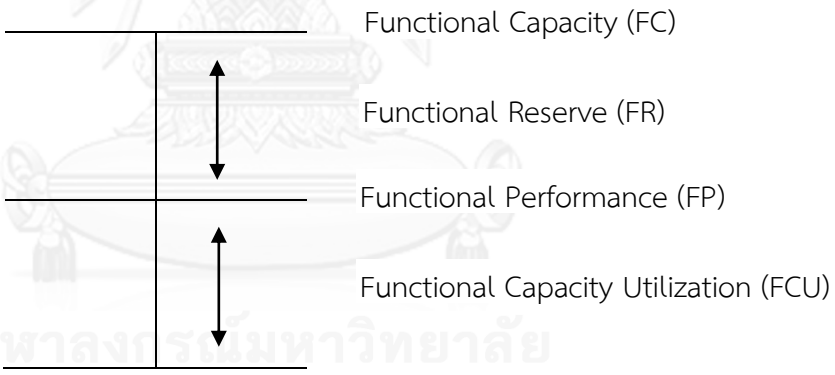

Figure 2 Visual representation of the functional status framework (Leidy, 1994a)

Functional capacity is an individual's maximum potential to perform activities. This usage is the same as that used in exercise physiology to refer to maximal physical exertion. Functional performance refers to the day-to-day corporeal activities people do in the normal course of their lives. These activities are the outcome of individual choice, subject to limits imposed by capacity. Functional

reserve is the difference between capacity and performance and refers to latent or dormant abilities that can be called upon in times of perceived need. Finally, functional capacity utilization is the extent to which capacity is called upon in the selected level of performance (Leidy, 1994a, 1994b). However, there is not a formula to calculate the difference between capacity and performance, nor a reference available to judge high versus low reserve. Until appropriate measuring tools are developed, these two dimensions provide little empirical usefulness. Nevertheless, it is important to be aware of the difference between capacity and performance and address them while assessing individual functional status (Wang, 2004).

The definitions as Leidy (1994a) defined *functional status* that are in accordance with World Health Organization (2001) in which performance is defined as "what an individual does in real situation," whereas capacity is "what an individual can do in the standard situation."

Keith (1994) defined *functional status* as "physical function including activity restrictions and fitness, psychological function including affective and cognitive functioning, social function including limitations in usual roles or major activity, social integration, social contact, and intimacy." She also notes that functional status measures were first devised to measure performance for the determination of disability.

Wilson and Cleary (1995) defined *functional status* as "the ability of an individual to perform particular defined tasks across four domains: physical, social, role, and psychological domains."

Tsay and Chao (2002) defined functional status encompasses different aspects of functioning including physical activity, cognitive, and psychological functioning.

Lenze et al. (2005) broadly conceptualized *functional status* into physical function, cognitive function, and activities of daily living (10 ADLs) that consist of social activities and interaction, and role performance including work and other role-related tasks. The 10 ADLs are feeding, dressing, bathing, toileting, using the telephone, heavy housework, light housework, shopping, meal preparation, and money management. Coustasse, Bae, Arvidson, Singh, and Treviño (2009) also noted that there are several components to a comprehensive assessment of an individual's ability to function. Physical functioning is one component which usually measured by the ability to accomplish the basic activity of daily living (ADL) and by limitations to the instrumental activity of daily living (IADL).

Richmond et al. (2004) described *functional status* as one component of function which refers to "an individual's actual performance of activities and tasks associated with his or her current life roles." Emphasis is on ADL and this is classified into the same three levels as those of Reuben and Solomon (1989) but gives more details. Basic ADL refer to personal care activities such as ambulating, feeding, bathing, dressing, grooming, maintaining continence, and going to the toilet. Instrumental ADL are activities related to how well one can manage within the home setting and in the community setting, and include tasks such as housekeeping, food preparation, shopping, and use of transportation. Advanced ADL represent physical and social functions that tend to be voluntary, for example working, traveling, engaging in hobbies, caring for others, or participating in social and religious groups.

Wang (2004) conducted a concept analysis of functional status, the concept, functional status, can best be defined as "the level of activities performed by an individual to realize needs of daily living in many aspects of life including physical, psychological, social, spiritual, intellectual, and roles." Level of performance is expected to correspond to normal expectation in the individual's nature, structure, and conditions.

In conclusion, the definition of functional status still lack consensus. Each definition describes different dimensions of functional status ranging from broader social roles to specific activities. In cardiovascular scientific evidence, functional status is often referred to an individual's ability to perform daily activities measured through capacity or actual action in daily activities (Coyne & Allen, 1998). To clarify the conceptualization of functional status in this study, the definition of functional status can best be defined as "an MI individual's ability to perform necessary daily activities in the normal course of his/her life to meet basic needs, fulfill usual roles, and maintain health and well-being." Such activities include basic, instrumental, and advanced ADL. This definition is based on the assumption that each person with MI has an ability to function, and the ability can be assessed through capacity in term of a physical maximum potential to perform necessary daily, which is relevant to normal expectation in the nature, structure, and conditions of the persons with MI.

2. Functional status in persons with myocardial infarction

According to literature review**,** the term *functional status* in persons with MI is often used interchangeably with various terms such as functional ability, functional capacity, functional performance, health status, quality of life, health related quality of life, activities of daily living (ADL), physical functioning, physical health, and

disability. These terms were applied in searching, reviewing, and integrating the findings related to functional status in persons with MI.

Extensive evidence documented that persons with MI had a decline in functional status. For instance, Daly et al. (2000) conducted a prospective cohort study to evaluate functional status by Short Form-36 questionnaires (SF-36) in persons with MI at the first, second, and third week after discharge. The mean scores of functional status in all components were lower than the normal value. Similarly, Hawkes et al. (2013) conducted a prospective cohort study to evaluate physical and mental functioning by SF-36 in persons with MI at baseline (1-2 weeks after hospitalization for MI) and at 6 months post-hospitalization. The results showed that the mean scores of physical and mental functioning in persons with MI at baseline were lower than the normal value. However, by 6 months, the levels of those functions were improved to normal value. Hamalainen et al. (2000) conducted a retrospective study to evaluate functional ability by Duke Activity Status Index (DASI) in persons experience prior to MI, at 3 month, and 1 year after discharge. The results showed that persons with MI had lower functional ability at 3 months and 1 year after discharge (21.7 ± 14.5 and 23.7 ± 14.7, respectively) than before MI event (35.4 ± 19.0). Brink et al. (2008) conducted a cross-sectional study to explore health problems, physical and mental functioning, and physical activity in working-age persons after MI 4-6 months. The results showed those persons had low physical health and physical activity after MI and they were negatively affect retuning to work.

Pilote et al. (2002) conducted a prospective cohort study to measure quality of life by SF-36 and functional status by DASI in persons with MI after discharge. The results showed that at 1 month after discharge, persons with MI at both sites with

and without angiography reduced their activities, compared to the baseline measurement during the month preceding admission. However, by 6 months and 1 year, the level of reduced activities was back to baseline in both groups.

In addition, Jarrell, Hains, Kisilevsky, and Brown (2005) conducted a cross-sectional study to evaluate functional ability by exercise stress test in persons with MI at discharge and at the sixth month after discharge. The results showed that functional ability at discharge and the sixth week after discharge was lower than for normal people. Furthermore, the literature review by King (2001) documented that functional disability in both males and females decreased over time and appeared to be stable by 6 months after the event. Women report lower levels of physical activity and higher levels of disruption in functional activities than men. Jui-Hua (2010) conducted a prospective and repeated measurement design to evaluate functional status by the Seattle Angina Questionnaire (SAQ) among persons with the first time acute myocardial infarction in the north part of Taiwan at 1 week and 2 months after the diagnosis. The SAQ scores of physical limitation, angina stability, and angina frequency were significantly higher than in the early stage (t = -6.07, p < .001; t = -5.84, p < .001; t = -4.35, p < .001). Moreover, it has been found that the physical limitation contributed to the 19% post-traumatic stress disorder variance. Rančić et al. (2013) conducted the prospective cohort study to evaluate health-related quality of life by EuroQuolVAS and EuroQuol 5 Dimension in persons with MI at 1 month after discharge. The results showed that the quality of life in those persons was very impaired that related to the lowering of physical and mental functioning. Additionally, the Thai study by Sriprasong (2008) measured functional

status in persons with MI at the first month after discharge and the mean scores were considerably lower for instrumental ADL and advance ADL.

In conclusion, among these longitudinal and cross-sectional studies in both western and Thai context, the functional status shows a similar decline in persons with MI receiving medical therapy and is still below the normal value despite the long course of time. More important, the first month after discharge is a critical period of deteriorating functional status because each an individual is in the process of recovery from physical trauma of AMI, while he/she has just begun to resume ADL by testing his/her limitation, learning to monitor symptoms, and modifying his/her lifestyle with appropriate limitations (Johnson & Morse, 1990). It is possible that a person with MI might reject or give up in resuming ADL if he/she gauges the physical, psychological, and social problems.

3. Factors related to functional status

Persons recovering from MI are particularly vulnerable to functional status decline because of the direct effects of MI on cardiac performance and psychosocial problems following MI. Many factors are related to functional status in persons with MI during the first month after discharge. The details of these factors are discussed as following.

Biological and physiological status including number of disease vessels, functional class, and number of risk-factors (e.g., hyperlipidemia, diabetes mellitus) are a major influence on functional status in the early recovery period. A vessel is considered to be significantly diseased if more than 50% lumen stenosis is demonstrated in one or more major branches of the coronary tree (Hofer et al., 2005).

Symptom status is a significant factor in functional status. The damage of the heart muscle affects abnormal cardiovascular inducing symptom of fatigue or dyspnea. Moreover, the narrowing of a coronary artery also leads to imbalance in oxygenated blood to the myocardium inducing, the symptom of chest pain. These conditions are a sign of limited energy resources, which affects regaining activities in daily life (Brewer, Philips, & Boss, 2002). Previous studies reported that the symptoms of chest pain, fatigue and dyspnea in form of biological events were the common symptoms occurring in persons with MI while at home, and indicated a decline in functional status (Alsen, Brink, & Persson, 2008; Arnold et al., 2009; Brink et al., 2012; Brink, Grankvist, Karlson, & Hallberg, 2005; Hofer et al., 2005; Juntawise, 1996; Kimble et al., 2011; Nathongkham, 2000).

Illness perceptions are key determinants of recovery after MI. The persons with MI who believe their illness to be more serious with long lasting consequences, are found to have greater levels of illness-related disability and are slower to return to work (Broadbent, Petrie, Ellis, Ying, & Gamble, 2004; Petrie, Cameron, Ellis, Buick, & Weinman, 2002). Similarly, the study by Figueiras and Weinman (2003) found when patients had positive perceptions of the identity and consequences of the MI, they showed (a) better physical and psychological functioning, (b) better sexual functioning, and (c) less impact of MI on social and recreational activities. Also, positive perceptions of a timeline were associated with lower levels of disability. Moreover, a systematic review with meta-analysis by French, Cooper, and Weinman (2006) reported that illness perceptions significantly predicted attendance at cardiac rehabilitation resulting in a better recovery and reduced disability. Persons with MI who had more positive identity, cure/control, consequences, and coherence beliefs,

were more likely to attend cardiac rehabilitation. In Thailand, Sriprasong et al. (2009) conducted a causal model to explore factors influencing functional status. The results showed that illness perceptions were a dominant influential pathway affecting functional status through coping strategies.

Coping procedures are cognitive and behavior actions individuals take (or do not take) to eliminate and control potential or ongoing illness threats (Leventhal, Brissette, & Leventhal, 2003). Persons with MI use both problem- and emotional-focused coping procedures. Problem-focused coping procedures include seeking help from family, sharing experiences with friends, re-prioritizing (valuing self and health), focusing on strengths, and testing limits. Emotional-focused coping procedures include sacrificing their own needs, feeling guilty and angry, denying, feeling dependent and troublesome, repressing feelings, and accepting what had happened (Kristofferzon, Lofmark, & Carlsson, 2003). Previous studies documented that coping procedures were significantly related to functional status. Negative coping contributed to functional decline (Brink et al., 2005; Shen, McCreary, & Myers, 2004; Sriprasong et al., 2009).

Anxiety and depression are prevalent among persons after myocardial infarction, with rates ranging from 24% to 31% and such symptoms often persist over the ensuing months (Lane, Carroll, Ring, Beevers, & Lip, 2002). More interesting, the Thai study by Sriprasong (2008) first conducted to study depressive symptoms in persons with MI during the first month after discharge found that depressive symptoms were not prevalent. Only 10 % of participants indicated moderate to severe depressive symptoms. However, a number of western studies documented the relationship between functional status and depressive symptom in persons with

MI. For instance, Hofer et al. (2005) found that anxiety and depression symptoms exerted the most significant influence on functional status in testing a causal model of health-related quality of life. Similarly, Fauerbach et al. (2005) found that depressive symptoms were related to reduce vitality and social function and increased role interference from psychological problems. Moreover, a study by de Jonge et al. (2006) reported that persons with MI with depressive disorder were more likely to have more limitation in functional status and more health complaints than those without. In addition, the Thai study by Sriprasong et al. (2009) documented that depression symptoms had a medium negative direct and indirect effect on functional status of persons with MI at the first month after discharge. The greater the number and intensity of depressive symptoms, the greater was the decline in functional status.

Self-efficacy is an individual's confidence about his abilities to mobilize the motivation, cognitive resources and courses of action needed to successfully execute a given task (Bandura, 1989, 1997, 2001). Several studies revealed that self-efficacy is a significant predictor of functional status in persons with cardiac disease. For example, Jenkins and Gortner (1998) found strong evidence for the predictive capability of self-efficacy for activity in a prospective cohort designed study with persons with MI. Perkins and Jenkins (1998) in a descriptive study of persons with MI following percutaneous transluminal coronary angioplasty, concluded that findings of higher self-efficacy relating to higher behavior performance supported the predictive ability of self-efficacy. Sarkar et al. (2007) found that self-efficacy was a strong significant influence on functional status in a cross-sectional study of 1024 persons with MI. After adjustment for CHD severity and depressive symptoms, a decrease in

self-efficacy score was independently associated with greater physical limitation (OR = 1.8, $p < .0001$), worse quality of life (OR = 1.6, $p < .0001$), and worse overall health (OR = 1.9, $p < .0001$). Similarly, Sarkar, Ali, and Whooley (2009) found that poorer cardiac functioning in persons with MI was associated with a lower degree of self-efficacy. The study by Brink et al. (2012) revealed that self-efficacy was positively related to physical and mental functioning in persons with MI with stable angina. In addition, they found an indirect effect of self-efficacy through fatigue.

The other previous studies also found that self-efficacy played a role in the adoption of, adherence to, and performance of exercise-related activities of persons with coronary artery disease (Carlson et al., 2001; Jackson et al., 2005; Woodgate & Brawley, 2008). Sullivan et al. (1998) found significantly higher self-efficacy in persons with MI predicted activities of daily living and physical, social, and leisure functional status at 1 month and 6 months. A large body of evidence revealed that the impact of different methods of treatment on health behavior was partly mediated through their effects on perceived self-efficacy (Lenz & Shortridge-Baggett, 2002). Moreover, several studies in persons with MI confirm the relationship between self-efficacy and function status in cardiac rehabilitation programs (Carroll, Robinson, Buselli, Berry, & Rankin, 2001; Dougherty, Johnson-Crowley, Lewis, & Thompson, 2001; Dougherty, Pyper, & Frasz, 2004; Song, 2003). The findings support the significance of self-efficacy on functional status. Enhanced self-efficacy can improve functional status in persons with MI.

Social support plays an important role in handling stressful events with respect to cardiac health. Extensive evidence documented that illness in persons with MI had effects on spouses and family life in term of fears and symptoms

occurrence (Kettunen, Solovieva, Laamanen, & Santavirta, 1999; Moser & Dracup, 2004; O'Farrell, Murray, & Hotz, 2000). Most family members usually provided overprotectiveness to persons with MI during the early recovery period due to concern of a recurrent cardiac event (Dalteg et al., 2011). Overprotectiveness from family members significantly predicts an adverse change in self efficacy that alters functional status (Berkhuysen, Nieuwland, Buunk, Sanderman, & Rispens, 1999). Furthermore, previous studies documented that family members being over-concerned led to poor functional status in term of dependency (Clarke et al., 1996; Riegel & Dracup, 1992a, 1992b; Sindhu & Sriprasong, 2001), while less social support also led to a decline in functional status (Leifheit-Limson et al., 2010).

Much evidence documented that social support was more effective to improve functional status for achieving the goals. For instance, Kristofferzon et al. (2003) found a strong influence of social support on functional status in Swedish women and men after MI. More women perceived available support from friends and grandchildren and more men perceived available support from their partners. Women had lower levels in physical and psychological function than men. Similarly, a study by Schulz et al. (2008) studied in CAD patients in the Multicenter Lifestyle Demonstration Project showed that significant improvement in physical, psychological and role functioning was related to social support group attendance. Durmaz et al. (2009) also found that persons with MI who got social support had a high score in physical, psychological, and role domains of quality of life.

More interesting, Benight and Bandura (2004) have documented that self-efficacy play a mediating role for social support in health behavior. Numerous studies also confirm an indirect positive effect of social support on increased levels of

participation in daily activity through enhancing self-efficacy (Anderson et al., 2006; McAuley et al., 2003; Resnick, Orwig, Magaziner, & Wynne, 2002).

Discharge readiness is defined as patients and their family members' perception of being prepared or not prepared for hospital discharge (Titler & Pettit, 1995). Sriprasong and coworker (2009) conducted a causal model of functional status in Thai persons with MI at the first month after discharge which showed that discharge readiness had both moderately direct and indirect effects on functional status (r = .46, $p < .01$). Similarly, the study by Duryee (1992) revealed that persons with MI who perceived that they were well informed with regard to their illness imposed increasing activity levels after discharge.

In conclusion, those factors as mentioned above are factors related to functional status in person with MI. Interestingly, the psychosocial factors including self-efficacy and social support are significant psychosocial factors related to the decline of functional status of persons with MI in this study. Accordingly, self-efficacy is the most powerful determinant of behavior change because it determines the initial decision to perform the behavior, the effort to be expended, and the extent of the persistence in the face of adversity, while social support plays an important role related to the change in self-efficacy. Both factors have a dynamic and reciprocal interaction (Bandura, 1997). A person with the stronger of perceived self-efficacy will has the greater chance to select more challenging tasks, be persistent and perform them successfully (Bandura, 1986, 1997). In this study, self-efficacy refers to "an MI individual's perceptions on the level of confidence or belief in their capability to practices of cardiac rehabilitation." Therefore, persons with MI with greater self-efficacy tend to show greater functional status in terms of increasing their practices

for cardiac rehabilitation. Under the social cognitive theory perspective, modeling by family members and friends indirectly influences behaviors since the developed model can strengthen self-efficacy related to a particular activity through observation, learning, and motivational processes (Bandura, 1997). With support from others, persons with MI will have a stronger belief in their capabilities and will have greater participation in the practices of cardiac rehabilitation. Therefore, in this study, self-efficacy and family support, are considered to be experimental variables, while, the other factors are considered for control in order to increase the internal validity of the study.

4. Measurement of functional status

There are many developed instruments to measure functional status. In persons with MI, both subjective and objective instruments are used to assess functional status. However, in this study would focus only the subjective instruments commonly used in person with MI. This is not an all-inclusive review of functional status instruments, but a review of those instruments used most frequently in the persons with MI. The subjective instruments are: 1) the Duke Activity Status Index [DASI] (Hlatky et al., 1989); 2) the Specific Activity Scale [SAS] (Goldman, Hashimoto, Cook, & Loscalzo, 1981); 3) the Seattle Angina Questionnaire [SAQ] (Spertus et al., 1995); and 4) the Beth Israel/UCLA Functional Status Questionnaire [FSQ] (Jette et al., 1986). The description of each instrument is presented in term of instrument description, critique, and analysis as follows. The summary of these instruments is shown in Table 1.

The subjective instruments

1) The Duke Activity Status Index (DASI). The DASI is a disease-specific questionnaire validated for cardiovascular disease. The DASI is a self-administered 12 items for measuring daily activities that incorporates four major activity domains: personal care, ambulation, household tasks, and sexual function and recreation. Each item is weighted on the known metabolic cost of each activity, and weights of positive terms are summed to form the DASI score for the patient (Hlatky et al., 1989). This instrument accurately measures functional capacity and assesses aspects of quality of life (Coyne & Allen, 1998; Hlatky et al., 1989).

Psychometric properties: For the instrument development by Hlatky et al. (1989), the 12-item scale of the DASI was developed by 1) taking into account the empirical correlations of questionnaire items with peak oxygen uptake, and 2) clinical judgment and information from previous studies about the activities best representing different aspects of physical functioning. Within each sphere of activity, stepwise multiple regression analyses were used to identify the questionnaire items that best correlated with peak oxygen uptake (Spearman correlation coefficient = .80). The final instrument, the DASI, was then tested in an independent sample. Fifty subjects undergoing exercise testing with measurement of oxygen uptake were asked to complete a self-administered questionnaire. The DASI correlated significantly ($p <$ .0001) with peak oxygen uptake (Spearman correlation coefficient=.58) in this independent sample. Further studies have supported the validation of the DASI in various populations. Results provide evidence of the acceptable values (Carter et al., 2002; Kaul et al., 2009; Mantziari et al., 2013; Ravani et al., 2012).

2) The Specific Activity Scale (SAS). The SAS was developed to assess cardiac functional class in heart population based on the metabolic equivalents of oxygen consumption required for activities the patient actually performs. The SAS is significantly more valid than the New York Heart Association criteria and the Canadian Cardiovascular Society criteria (Goldman et al., 1981).

The SAS contains five questions, which refer to activities appropriate for heart patient population. The approximate metabolic costs of a variety of personal care, housework, occupational and recreational activities are estimated based on available data. For example, one question is: can you walk down a flight of steps without stopping? (using energy 4.5-5.2 metabolic equivalents [METs]), the answer is available as yes or no. It is determined whether specific activities are performed; if the activity is performed, a researcher will ask what symptoms are provoked by it; if the activity is not performed, a researcher will ask why not. This instrument did not attempt to obtain a detailed cardiovascular history. When performed by a physician, the entire interview normally takes less than 2 minutes. A patient is considered able to perform a given number of metabolic equivalents if the appropriate activity could be performed to completion with or without symptoms. Conversely, if the activity is not performed because of symptoms, fear of symptoms, or habit, and if no other activity of approximately equal or higher metabolic cost is performed, the patient is considered unable to attain the given metabolic load. A patient is placed into the SAS functional class according to the metabolic load associated with the most strenuous activity performed during a time when the patient estimated his or her functional level to be similar to the present. For example, the criteria for the SAS

Classifications in class I is patient can perform to completion any activity requiring > 7 METs (Goldman et al., 1981).

Psychometric properties: The validity and reliability of SAS were tested in a sample of 75 patients with heart disease. The SAS was validated against stress testing (treadmill performance) with use of Cohen's kappa as the test statistic for agreement. The valid rate (percentage of functional class estimates that agreed with the treadmill performance class) of SAS was 68 %. Also, the SAS had correlation (r = .66) with the duration of treadmill exercise in seconds (peak O2 uptake). Furthermore, the SAS was evaluated for interrater reliability, which indicated 73% agreement (Goldman et al., 1981).

3) The Seattle Angina Questionnaire (SAQ). The SAQ was developed to measure functional performance in coronary artery disease patients. It was carried out in four groups of patients: 70 undergoing exercise treadmill testing, 58 undergoing coronary angioplasty, 160 with initially stable coronary artery disease, and an additional 84 with coronary artery disease (Spertus et al., 1995).

The SAQ is a 19-item, 5-6 point Likert, self-administered questionnaire that takes approximately less than 5 minutes to complete. It consists of five dimensions of coronary artery disease: physical limitation, anginal stability, anginal frequency, treatment satisfaction, and quality of life. Each of the five dimensions is scored by assigning each response an ordinal value, beginning with 1 for the response that implies the lowest level of functioning, and summing across items within each of the 5 scales. Scale scores are then transformed to 0-100 range by subtracting the lowest possible scale score, dividing by the range of the scale and multiplying by 100. No overall scale score is generated (Spertus et al., 1995).

Psychometric properties: In support of its content validity, scale development is based on modification of existing instruments to make them specific to coronary disease. The physical limitation scale (question 1) measures how daily activities are limited by symptoms of coronary disease. Specific activities were chosen to minimize differences among socioeconomic classes and gender. The anginal stability scale (question 2) assesses change in the frequency of angina at patients' most strenuous level of activity. The anginal frequency scale (questions 3 and 4) assesses the frequency of angina occurring and taking nitroglycerin tablets in patients' daily life. The treatment satisfaction scale (questions 5 to 8) quantifies patients' satisfaction with their current treatment, and the disease perception scale (questions 9 to 11) characterizes the burden of coronary artery disease on patients' quality of life (Spertus et al., 1995).

The criterion-related validity. Scores were compared to duration of exercise treadmill tests, physician diagnoses, nitroglycerin refills and validated self-report instruments. All five scales correlated significantly with other measures of diagnosis and patient function ($r = .31$-$.70$, $p < .001$). No construct validity was tested.

In support of its reliability, test-retest was assessed. Mean scores did not change during the 3-month study period among patients with stable coronary artery disease. Intraclass correlation coefficient (ICC) at 3 months in stable patients was .24 to .83 among domains (Spertus et al., 1995).

4) The Beth Israel/UCLA Functional Status Questionnaire (FSQ). The FSQ was developed from existing instruments such as the Functional Status Assessment Instrument, the Sickness Impact Profile, and the Health Insurance Experiment Survey (Jette et al., 1986). The FSQ provides a comprehensive assessment in ambulatory

patients of physical, psychological, social, and role function. The FSQ is designed to screen for disability and to monitor clinically meaningful change in function. It is a self-administered survey that takes approximately 15 minutes to complete.

The FSQ includes two scales that assess two aspects of physical function: a 3-item scale of basic activities of daily living (BADLs) and a 6-item scale of intermediate activities of daily living (IADLs). It also has a 5-item scale of mental health. There are three scales that assess social or role functions: a 6-item measure of work performance (for those employed during the previous month), a 3-item measure of social function, and a 5-item measure of social inter-action. Single questions assess work status, bed disability days, days on which the respondent cut down on usual activities, satisfaction with sexual relationships, frequency of social interactions, and an overall rating of health status. Transformed scale values range from 0 to 100, with a score of 100 indicating maximum functional ability. The report presents each transformed score on a visual analog scale (VAS) (Jette et al., 1986).

Psychometric properties: The validity and reliability of the FSQ were tested in a sample of 1,153 ambulatory patients. Two methods, content and construct validity, were used to examine the FSQ's validity. Content validity relied on expert judgment to determine the adequacy with which important content about each functional dimension was expressed in the measure. Items were included in the FSQ after a careful review of existing functional status instruments. Construct validity showed the statistically significant correlations between the six FSQ scale scores and scores on seven health measures (age, bed disability days, restricted activity days, satisfaction with health, work role limitations, number of close friends, and frequency of social contact). The data support 31 of the 42 hypothesized relationships. Internal

consistency was α = .64 to .82 among 6 scales. Test-retest reliability was not assessed (Jette et al., 1986).

Table 1 Compare and contrast subjective instruments of functional status

	DASI	SAS	SAQ	FSQ
Conceptual basis				
- Purpose of measure	- Developed to be a disease-specific measurement for measuring daily activities. - To assess treatment effects.	- To assess cardiac function in a more reproducible manner.	- Developed to be a cardiac-specific measure for more than physical function domain.	- To screen for disability and monitor for meaningful change in function.
- Dimension measured	Four domains: - personal care, - ambulation, - household tasks, - sexual function & recreation activities.	Four domains: - personal care, - housework, - occupational, - recreational activities.	Five domains: - physical limitation, - anginal stability, - anginal frequency, - treatment satisfaction, - quality of life.	Four domains: - physical, - psychological, - social, - role performance.
Scaling				
- Level of measurement	Continuous.	Ordinal.	Continuous.	Continuous.
- Scoring	-Two separate scales. -Two scores in each scale: no = 0 and yes = estimate of a patient's peak oxygen uptake (METs) in each of the activities. - Sum score can be weighted for a range of 0 to 58.2.	-Patients are placed is one of four description class (Class I-IV).	-Five separate scales. -Scores range beginning with 1 for the response. -No aggregate score.	-Six summed scales and six single items. -Transformed scale values range from 0 to 100, reported score on VAS.

Table 1 Compare and contrast subjective instruments of functional status (Continued)

	DASI	SAS	SAQ	FSQ
Instrument development: reliability testing	- Not available.	- Interrater reliability = 73% agreement.	- Test-retest reliability: tested over 3 month interval, scores of patients with stable coronary artery disease did not change. - Intraclass correlation (ICC) at 3 months in stable patients= .24 to .83. among domains.	- Internal consistency: α = .64 to .82 among 6 scales. -Test-retest reliability not assessed.
Instrument development: validity testing	- For the development sample (interview), the Spearman correlation coefficient with peak oxygen uptake= .81, $p < .0001$; - For the validation sample (questionnaire) (50 independent subjects), the correlation with peak oxygen uptake= .58, $p < .0001$.	- Agreement with stress testing = 68%, Peak O_2uptake: r = .67. -No construct validity tested.	- Criterion correlation against the: DASI, r = .40; SAS, r = .36; SF-36, r = .60. -No construct validity tested.	- Construct validity tested with 31 of 42 proposed hypotheses supported. -No Criterion validity measures done.
Applicability				
- Mode of administration	Self-administered.	Interviewer administered.	Self-administered.	Self-administered.
- Time/Cost	Take easily Inexpensive.	< 2 min. Inexpensive.	< 5 min. Inexpensive	< 15 min. Inexpensive.

Note. DASI = The Duke Activity Status Index; SAS = The Specific Activity Scale; SAQ = The Seattle Angina Questionnaire; FSQ = The Beth Israel/UCLA Functional Status Questionnaire (FSQ).

Discussion for the strengths and weaknesses in each subjective instrument

The Duke Activity Status Index (DASI). The DASI is an existing instrument that accurately measures functional status while providing insights to assess effects of treatment. The DASI was developed by studying 50 subjects undergoing exercise testing with measurement of peak oxygen uptake. Individual items were taken directly from several previously tested instruments. Results provide evidence of the acceptable validity. Although no reliable testing is available in the original instrument development, there is a lot of evidence showing the strengthening of the DASI with an acceptable reliability value in particular with cardiac patients. Moreover, this instrument is a short self-administered questionnaire that is taken easily and inexpensive.

The Specific Activity Scale (SAS). The SAS is developed to assess cardiac functional class instead of the New York Heart Association (NYHA) and the Canadian Cardiovascular Society System (CCS) due to uncertainty of NYHA and CCS regarding both the reliability and the validity. The interrater reliability of the SAS is acceptable but the validity is not good. However, its validity is significantly higher than the validities of both NYHA and CCS. This increased validity of the SAS is not surprising because the items are standardized questions related to the individual activities that a patient could perform and then compare the responses with a patient's actual ability to exercise. Furthermore, this instrument is the easy to use by a nonphysician. It is especially better than the other measurements for the evaluation of true class II patients and is significantly less likely to underestimate treadmill performance.

However, the scale of this instrument is ordinal scale which is a relatively "weak" form of "measurement." In this scale, numbers indicate the rank order of measurements. The distance between ranks is unknown and assumed to vary across the span of the scale. Ordinal data allows the user to distinguish lesser from greater magnitude along one scale. Ordinal data do not allow the magnitude of the difference to be measured with any degree of precision or unambiguous meaning. Ordinal data do not allow scores to be compared or mathematically manipulated with unambiguous meaning. Thus, it may be unsuitable for measuring functional status in this study.

The Seattle Angina Questionnaire (SAQ). The SAQ measures five clinically important dimensions of health including functional status in patients with coronary artery disease, unlike the SAS which measures the effects of other comorbid conditions. The SAQ assesses more than the domain of physical functioning. This is a disease-specific measure for patients with coronary artery disease.

Although the SAQ assesses more than the domain of physical functioning, the other four domains focus on symptoms and quality of life which are not targeted constructs. In addition, patients with atypical symptoms or silent ischemia may have difficulty answering these questions because this instrument focuses on assessing only CAD patients with classical symptoms. In addition, although there is a significant correlation in criterion-related validity testing, the correlation coefficient is only low to moderate. Moreover, the intraclass correlation coefficient (ICC) of some subscales especially angina stability domain is the lowest (r = .24).

The Beth Israel/UCLA Functional Status Questionnaire (FSQ). The FSQ is relatively short and covers a wide range of domains; it has been adopted for use in a variety of situations. The process of scale development is strongly enough. Items were included in the FSQ after a careful review of existing functional status instruments.

The reliability of the FSQ scale was high when administered in a wide range of settings and patient populations. In particular, two major studies for testing the psychometric properties of this instrument (the acute myocardial infarction (AMI) Patient Outcome Research Team study, and the Cooperative Cardiovascular Project) confirm an acceptable construct validity of selected FSQ scales in persons with MI.

However, there are limitations to the data available about the FSQ. There is not any data about assessments of reliability based on test-retest assessments or any assessments of validity using independently established criteria, other than mortality. In addition, some items seem to ask about feelings related to quality of life. These items are not clear and results are difficult to interpret.

In conclusion, there is no perfect instrument to measure functional status in persons with MI. However, the DASI is selected as the subjective instruments to measure functional status in this study with appropriate reasons as follows: 1) The conceptualization and domain of measuring in the DASI are congruent with the operational definition of functional status in this study; 2) The DASI poses relatively no more subjective burden than others supposed to measure the same concepts; 3) Its validity and reliability have been well-established in population of heart disease; and 4) This instrument is easily taken and inexpensive.

Social Cognitive Theory

Functional status among persons with MI has been influenced by significant variables (i.e., self-efficacy and family support). It needs to understand these variables through theoretical description. One explicit theory of human behavior that points these significant variables is Bandura's social cognitive theory (SCT).

On the basis of the SCT, cognitive processes are emergent brain activities which exert determinative influence on human behaviors. Human behaviors operate within a triadic, dynamic, and reciprocal interaction of personal factors, behavioral, and environmental factors. Reciprocal causation does not mean that the different sources of influence are of equal strength. Some may be stronger than others. Nor do the reciprocal influences all occur simultaneously. It takes time for a causal factor to exert its influence and activate reciprocal influences (Bandura, 1986, 1989, 1997). The model of reciprocal causation is shown in Figure 3

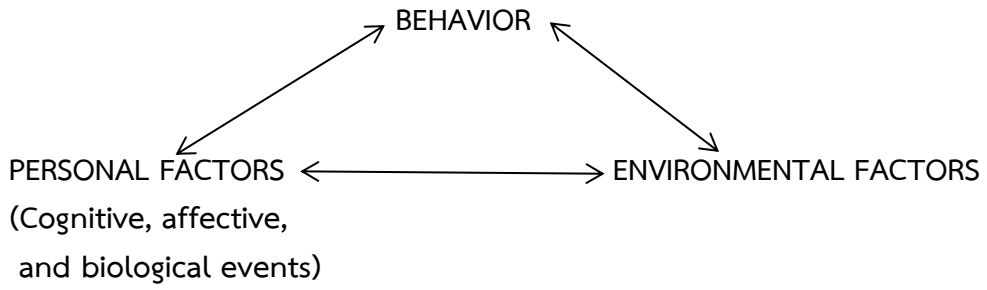

Figure 3 Triadic reciprocal determinism in the social cognitive theory

According to triadic reciprocal determinism in the SCT, personal factors are influential in determining behavior that include the form of cognitive, affective, and biological events (Bandura, 1986). The vital personal factors are the individual's capabilities including symbolizing, forethought, self-reflection, vicarious, and self-regulatory capability (Bandura, 1986, 1997). These capabilities provide a person with the cognitive development which is important in determining their future (Bandura, 1997).

Similarly, the reciprocal determinism of environmental influences and behavior, environment refers to the factors that can affect a person's behavior. There are social and physical environments. Social environment includes family members, friends and colleagues. Physical environment is such as the size of a room, the ambient temperature or the availability of certain foods. In the transactions of everyday life, behavior alters environmental conditions and is, in turn, altered by the very conditions it creates. The environment is not a fixed entity that inevitably impinges upon individuals. When mobility is constrained, some aspects of the physical and social environment may encroach on individuals whether they like it or not. But most aspects of the environment do not operate as an influence until they are activated by appropriate behavior. The aspect of the potential environment that becomes the actual environment for given individuals thus depends on how they behave (Bandura, 1989).

In addition, the reciprocal causation is concerned with the interactive relation between personal characteristics and environmental influences. Human expectations, beliefs, emotional bents and cognitive competencies are developed and modified by

social influences that convey information and activate emotional reactions through modeling, instruction and social persuasion (Bandura, 1986). People also evoke different reactions from their social environment by their physical characteristics, such as their age, size, race, sex, and physical attractiveness, quite apart from what they say and do. People similarly activate different social reactions depending on their socially conferred roles and status. Thus, by their social status and observable characteristics people can affect their social environment before they say or do anything (Bandura, 1999).

In particular, the SCT forms a basis for developing an intervention through some of the theory's propositions about individual capabilities and behavior. People are neither driven by inner forces nor automatically shaped and controlled by the environment. They function as contributors to their own motivation, behavior, and development within a network of reciprocally interacting influences. Persons are characterized within this theoretical perspective in terms of capabilities. Five fundamental human capabilities underpinning behavior include symbolizing, forethought, self-reflection, vicarious, and self-regulatory capability (Bandura, 1986, 1997).

Symbolizing capability is the most external influence that affects a person's behaviors through cognitive processes. Human beings can use symbols such as pictures, signs or words to express their thoughts and feelings because they give these symbols meaning, form and continuity to their past experiences. Forethought is a person's capability to motivate him/herself and guide his/her actions or behaviors. Self-reflection enables people to analyze and think about their experiences and thought processes, to explore their cognitive processes and self-beliefs, to engage in

self-evaluation, and to alter their thinking accordingly. Vicarious capability indicates that a person can learn not only from direct experience, but also from observing others. Bandura (1989) proposed that self-regulatory systems mediate external influences and provide a basis for purposeful action. Self-regulatory capability allows a person to have control over his/her thoughts, feelings, motivations, and actions. Motivation can occur externally by rewards, or internally by self-pride (Bandura, 1989, 1997; Bandura, 2001).

In the SCT, perceived self-efficacy and outcome expectations is relevant to self- regulation. Both perceived self-efficacy and outcome expectations are keys to determine effective behavioral changes (Lev, 1997). Perceived self-efficacy is the most powerful determinants of behavioral change because it determines the initial decision to perform the behavior, the effort to be expended, and the extent of the persistence in the face of adversity (Bandura, 1997). Perceived self-efficacy is an individual's confidence about his abilities to mobilize the motivation, cognitive resources and courses of action needed to successfully execute a given task (Bandura, 1989, 1997; Bandura, 2001). People will be more likely to engage in behaviors that they believe they can successfully perform, and avoid behaviors in which they feel that they will be unsuccessful. People with high levels of self-efficacy are more likely to pursue challenging goals, cope with pain, and persevere through setbacks, while those with low self-efficacy avoid challenges and tend to give up when confronted with obstacles (Feltz, Short, & Sullivan, 2008). Self-efficacy beliefs can develop human functioning through four processes: choice behavior, effort expenditure and persistence, thought patterns, and emotional reactions (Bandura, 1986). The first two reflects the behavioral domain; the last two are mainly

cognitive in nature (Bandura, 1997). With respect to cognitive functioning, low self-efficacy beliefs could lead to less participation in challenging cognitive activities as well as less effort or persistency in such activities; in turn, people with a high self-efficacy level will adopt and maintain their behaviors (Bandura, 1997). Bandura (1997) postulated that people who increase their level of confidence will anticipate successful outcomes. Therefore, outcome expectations depend on self- efficacy related judgments.

Self-efficacy is influenced by four sources of information. First, enactive mastery experience provides the most influential source of efficacy information, because it is based on the authentic mastery experiences (Bandura, 1997). Second, vicarious experience is a way of influencing. People's belief about their own capabilities can be enhanced by observing the success of others (Bandura, 1997). Particularly, similar attributes in both the role model and an individual will help to increase one's confidence (Bandura, 1994). Third, verbal persuasion involves exposure to the verbal judgments of others and is often used in combination with other sources (Bandura, 1997). Finally, physiological and emotional states provide the fourth source of efficacy information. In stressful situations, people commonly exhibit signs of distress on physiological cues such as shakes, aches and pains, fatigue, and nausea. Perceptions of these responses in oneself can markedly alter self-efficacy (Bandura, 1997). Different people interpret those cues differently (Ziegler, 2005). Persons who are equipped with skills to reduce aversive physiological and emotional reactions will evaluate their self-efficacy positively (Maddux & Lewis, 1995). Bandura (1997) stated that people with positive emotion would increase their level of self-efficacy.

Regarding one foundation of the SCT perspective, environmental factors refer to all physically external structures that affect behavior by the interaction of internal factors with people's perceptions (Bandura, 1986). Additionally, the environment influences can be constructed from the psychological mechanism of self-system such as motivation (Bandura, 1986, 1997). Bandura (1997) further expanded the concept of environment to include social systems and physical environment. Furthermore, individual's beliefs of his or her capabilities can influence thoughts and emotions during interaction with his/her environment (Bandura, 1986).

In conclusion, the SCT is a comprehensive theory of human behavior that has proven useful in the studies of health behavior since it combined the concept of cognitive processes with the concept of performance-based procedures (Bandura, 1997; Bandura, 2001). The SCT can explain the significant factors (i.e., self-efficacy and family support) related to functional status in persons with MI of this study. Therefore, the SCT is selected to be a theoretical framework of this study.

Social Support Concept

On the basis of the SCT, the relationship between cognitive factors and environmental factors shapes people's actions or behaviors. Social support within the environment factors plays an influential role in cognitive development through motivation (Bandura, 1986, 1997). Numerous studies confirm that family support is positively associated with increased levels of participation in activity through self-efficacy (Anderson et al., 2006; McAuley et al., 2003; McNeill et al., 2006; Resnick et al., 2002). Self-efficacy plays a mediating role for social support in health behavior (Benight & Bandura, 2004).

Social support has important causal effects on health and exposure to stress (House, 1981). Positive social support promotes and maintains physical and mental health, and especially buffers or ameliorate the potential deleterious effects of psychosocial stress on health (House, 1987). Social support reduces the effects of stressful life events on health through either the supportive action of others (e.g., advice, reassurance) or the belief that support is available. Supportive actions are thought to enhance coping performance, while perceptions of available support lead to appraising potentially threatening situations as less stressful (Lakey & Cohen, 2000).

While research on social support has expanded rapidly, the social support construct has been plagued by conceptual vagueness. Definitions of social support often have been simplistic and based neither on well-standardized instruments nor on convergent indices.

Social support, social networks, and social integration are three terms that designate three different perspectives on the resources. These three terms are often confused because they have some degree of overlap and mutual influence. For this reason, clarifying the distinctions between social support, social networks, and social integration characteristics is one way of refining the social support construct that is most relevant to the aims, context, and precision in developing intervention of this study.

Social support, network, and integration

In the natural environment, social support arises from the conduct of personal relationships. Indeed, the relationship itself gives supportive meaning to behavior and, conversely, supportive behaviors can bring relationship meaning to

interactions (Gottlieb & Bergen, 2010), witness the deterioration of close relationships in which emotional support has eroded and the formation and strengthening of social bonds when unexpected support materializes. It follows that social support is not a commodity that resides in the provider and passes to the recipient, but that it is an expression of the mutuality and affection characteristic of the relationship between the parties. Close relationships tend to generate a wider range of types of support than casual acquaintances, and social ties that are more strictly defined by normative role definitions tend to provide more specialized support. Recognizing this, any sensitive and comprehensive inquiry into social support must first map the participants' larger social field to ensure that all potentially relevant sources of support are taken into account (Gottlieb & Bergen, 2010).

The social network is a unit of social structure that affords a vantage point for such an account because it consists of an individual's ties and the ties among them (Gottlieb & Bergen, 2010). A network perspective can provide instruction about social integration and social support. Structural properties of the network provide information about social integration because the number of ties, their density or interconnectedness, and the number of different roles that the central person (often referred to as “ego”) occupies in relation to the ties all indicate the extent to which the person is enveloped in the social fabric (Cohen & Lemay, 2007; Smith & Christakis, 2008). The greater the number and diversity of private and public social ties, the greater the social integration (Gottlieb & Bergen, 2010)

Gottlieb & Bergen (2010) reviewed about the varied structural, functional, and evaluative aspects of social support that can be assessed. They documented that functional support is the varied kinds of resources that flow through the network's

social ties. Whereas, structural support is the number and pattern of direct and indirect social ties that surround the individual. To identify the sources of support in terms of different categories of social ties with lay people (e.g., family members, friends, or neighbors), and the types of support (e.g., emotional, instrumental, companionship, informational, or esteem support), they should depend on the study's purpose.

In this study, social support is defined based on House's social support concept, that is, a valuable resource comprising tangible and intangible forms of assistance that individuals receive from others (e.g., family, friends, coworkers) (House, 1981; House et al., 1988; House et al., 1985; Tang, 2008).

Social support comprises four types of support (House, 1981). Emotional support is associated with sharing life experiences. It involves the provision of empathy, love, trust, and caring. Appraisal support involves the provision of information that is useful for self-evaluation purposes: constructive feedback, affirmation, and social comparison. Informational support involves the provision of advice, suggestions, and information that a person can use to address problems. Instrumental support involves the provision of tangible aids and services that directly assist a person in need.

In this study, family support for the persons with MI was integrated into the program, along with the four major sources of information in order to maximize the sense of self-efficacy. Family members, in particular significant caregivers in a family, were involved in the program by providing emotional, appraisal, informational, and instrumental supports based on the social support concept by House (1981).

Cardiac Rehabilitation

The World Health Organization has defined cardiac rehabilitation as “the sum of activities required to ensure patients with the best possible physical, mental and social conditions so that they may, by their own efforts, preserve or resume when lost, as normal a place as possible in life of the community. Rehabilitation cannot be regarded as an isolated form or stage of therapy but must be integrated within secondary prevention services of which it forms only one facet” (World Health Organization, 1993).

Taylor et al. (2004) defined cardiac rehabilitation as the “coordinated, multifaceted interventions designed to optimize a cardiac patient’s physical, psychological, and social functioning, in addition to stabilizing, slowing, or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality.”

As such definitions, cardiac rehabilitation (CR)/secondary prevention programs provide an important and efficient venue in which to deliver effective preventive care of patients with cardiovascular disease. Consensus statements from the American Heart Association, the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), and the Agency for Health Care Policy and Research conclude that cardiac rehabilitation programs should offer a multifaceted and multidisciplinary approach to overall cardiovascular risk reduction and that programs that consist of exercise training alone are not considered cardiac rehabilitation (Balady et al., 2007). The AHA and the AACVPR recognize that all cardiac rehabilitation/secondary prevention programs should contain specific core components that aim to optimize cardiovascular risk reduction, foster healthy

behaviors and compliance with these behaviors, reduce disability, and promote an active lifestyle for patients with cardiovascular disease (Balady et al., 2007).

The core components of cardiac rehabilitation/secondary prevention programs in agreement with the 2007 update of the AHA/American College of Cardiology (ACC) secondary prevention guidelines include: 1) baseline patient assessment, 2) nutritional counseling, 3) risk-factor management (lipids, blood pressure, weight, diabetes mellitus, and smoking), 4) psychosocial interventions, and 5) physical activity counseling and exercise training (Balady et al., 2007). The information on the evaluation, interventions, and expected outcomes in each of the core components of cardiac rehabilitation/secondary prevention programs is presented in Tables 2-6.

Table 2 Core components of cardiac rehabilitation/secondary prevention programs: Patient assessment (Balady et al., 2007)

Patient assessment	
- Evaluation	● Medical History: Review current and prior cardiovascular medical and surgical diagnoses and procedures (including assessment of left ventricular function); comorbidities (including peripheral arterial disease, cerebral vascular disease, pulmonary disease, kidney disease, diabetes mellitus, musculoskeletal and neuromuscular disorders, depression, and other pertinent diseases); symptoms of cardiovascular disease; medications (including dose, frequency, and compliance); date of most recent influenza vaccination; cardiovascular risk profile; and educational barriers and preferences. Refer to each core component of care for relevant assessment measures. ● Physical Examination: Assess cardiopulmonary systems (including pulse rate and regularity, blood pressure, auscultation of heart and lungs, palpation and inspection of lower extremities for edema and presence of arterial pulses); post-cardiovascular procedure wound sites; orthopedic and neuromuscular status; and cognitive function. Refer to each core component for respective additional physical measures. ● Testing: Obtain resting 12-lead ECG; assess patient's perceived health-related quality of life or health status. Refer to each core component for additional specified tests.
- Interventions	● Document the patient assessment information that reflects the patient's current status and guides the development and implementation of (1) a patient treatment plan that prioritizes goals and outlines intervention strategies for risk reduction, and (2) a discharge/follow-up plan that reflects progress toward goals and guides long-term secondary prevention plans.

Table 2 Core components of cardiac rehabilitation/secondary prevention programs: Patient assessment (Balady et al., 2007) (Continued)

Patient assessment (continued)	
- Interventions	● Interactively, communicate the treatment and follow-up plans with the patient and appropriate family members/domestic partners in collaboration with the primary healthcare provider. ● In concert with the primary care provider and/or cardiologist, ensure that the patient is taking appropriate doses of aspirin, clopidogrel, β blockers, lipid-lowering agents, and ACE inhibitors or angiotensin receptor blockers as per the ACC/AHA, and that the patient has had an annual influenza vaccination.
- Expected outcomes	● Patient Treatment Plan: Documented evidence of patient assessment and priority short-term (i.e., weeks-months) goals within the core components of care that guide intervention strategies. Discussion and provision of the initial and follow-up plans to the patient in collaboration with the primary healthcare provider. ● Outcome Report: Documented evidence of patient outcomes within the core components of care that reflects progress toward goals, including whether the patient is taking appropriate doses of aspirin, clopidogrel, β blockers, and ACE inhibitors or angiotensin receptor blockers as per the ACC/AHA, and whether the patient has had an annual influenza vaccination (and if not, documented evidence for why not), and identifies specific areas that require further intervention and monitoring. ● Discharge Plan: Documented discharge plan summarizing long-term goals and strategies for success.

Table 3 Core components of cardiac rehabilitation/secondary prevention programs: Nutritional counseling (Balady et al., 2007)

Nutritional counseling	
- Evaluation	● Obtain estimates of total daily caloric intake and dietary content of saturated fat, *trans* fat, cholesterol, sodium, and nutrients. ● Assess eating habits, including fruit and vegetable, whole grain, and fish consumption; number of meals and snacks; frequency of dining out; and alcohol consumption. ● Determine target areas for nutrition intervention as outlined in the core components of weight, hypertension, diabetes, as well as heart failure, kidney disease, and other comorbidities.
- Interventions	● Prescribe specific dietary modifications aiming to at least attain the saturated fat and cholesterol content limits of the Therapeutic Lifestyle Change diet. Individualize diet plan according to specific target areas as outlined in the core components of weight, hypertension, and diabetes (as outlined in this table), as well as heart failure and other comorbidities. Recommendations should be sensitive and relevant to cultural preferences. ● Educate and counsel patient (and appropriate family members/ Domestic partners) on dietary goals and how to attain them. ● Incorporate behavior change models and compliance strategies into counseling sessions.
- Expected outcomes	● Patient adheres to prescribed diet. ● Patient understands basic principles of dietary content, such as calories, fat, cholesterol, and nutrients. ● A plan has been provided to address eating behavior problems.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007)

1) Weight management	
- Evaluation	● Measure weight, height, and waist circumference. Calculate body mass index (BMI).
- Interventions	● In patients with BMI > 25 kg/m^2 and/or waist > 40 inches in men (102 cm) and > 35 inches (88 cm) in women (*BMI definitions for overweight and obesity may differ by race/ethnicity and region of the world. Relevant definitions, when available, should be respectively applied*) - Establish reasonable short-term and long-term weight goals individualized to the patient and his or her associated risk-factors (e.g., reduce body weight by at least 5% and preferably by > 10% at a rate of 1-2 lb/wk over a period of time up to 6 months). - Develop a combined diet, physical activity/exercise, and behavioral program designed to reduce total caloric intake, maintain appropriate intake of nutrients and fiber, and increase energy expenditure. The exercise component should strive to include daily, longer distance/duration walking (e.g., 60-90 min). - Aim for an energy deficit tailored to achieve weight goals (e.g., 500-1000 kcal/day).
- Expected outcomes	● Short-term: Continue to assess and modify interventions until progressive weight loss is achieved. Provide referral to specialized, validated nutrition weight loss programs if weight goals are not achieved. ● Long-term: Patient adheres to diet and physical activity/exercise program aimed toward attainment of established weight goal.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

2) Blood pressure management	
- Evaluation	● Measure seated resting blood pressure on ≥2 visits. ● Measure blood pressure in both arms at program entry. ● To rule out orthostatic hypotension, measure lying, seated, and standing blood pressure at program entry and after adjustments in antihypertensive drug therapy. ● Assess current treatment and compliance. ● Assess use of nonprescription drugs that may adversely affect blood pressure.
- Interventions	● Provide and/or monitor drug therapy in concert with primary healthcare provider as follows: ● If blood pressure is 120-139 mmHg systolic or 80-89 mmHg diastolic: - Provide lifestyle modifications, including regular physical activity/exercise; weight management; moderate sodium restriction and increased consumption of fresh fruits, vegetables, and low-fat dairy products; alcohol moderation; and smoking cessation. - Provide drug therapy for patients with chronic kidney disease, heart failure, or diabetes if blood pressure is ≥130/≥80 mmHg after lifestyle modification. ● If blood pressure is ≥140 mmHg systolic or ≥90 mmHg diastolic: - Provide lifestyle modification and drug therapy.
- Expected outcomes	● Short-term: Continue to assess and modify intervention until normalization of blood pressure in prehypertensive patients; <140 mmHg systolic and <90 mmHg diastolic in hypertensive patients; <130 mmHg systolic and <80 mmHg diastolic in hypertensive patients with diabetes, heart failure, or chronic kidney disease. ● Long-term: Maintain blood pressure at goal levels.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

3) Lipid management	
- Evaluation	● Obtain fasting measures of total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides. In those patients with abnormal levels, obtain a detailed history to determine whether diet, drug, and/or other conditions that may affect lipid levels can be altered. ● Assess current treatment and compliance. ● Repeat lipid profiles at 4-6 weeks after hospitalization and at 2 months after initiation or change in lipid-lowering medications. ● Assess creatine kinase levels and liver function in patients taking lipid-lowering medications as recommended by NCEP
- interventions	● Provide nutritional counseling consistent with the Therapeutic Lifestyle Change diet, such as the recommendation to add plant stanol/sterols and viscous fiber and the encouragement to consume more omega-3 fatty acids, as well as weight management counseling, as needed, in all patients. Add or intensify drug treatment in those with LDL >100 mg/dL; consider adding drug treatment in those with LDL >70 mg/dL. ● Provide interventions directed toward management of triglycerides to attain non–high-density lipoprotein cholesterol <130 mg/dL. These include nutritional counseling and weight management, exercise, smoking cessation, alcohol moderation, and drug therapy as per NCEP and AHA/ACC. ● Provide and/or monitor drug treatment in concert with primary healthcare provider.
- Expected outcomes	● Short-term: Continue to assess and modify intervention until LDL is <100 mg/dL (further reduction to a goal <70 mg/dL is considered reasonable) and non–high-density lipoprotein cholesterol <130 mg/dL (further reduction to a goal of <100 mg/dL is considered reasonable). ● Long-term: LDL <100 mg/dL (further reduction to a goal <70 mg/dL is considered reasonable). Non–high-density lipoprotein cholesterol <130 mg/dL (further reduction to a goal of <100 mg/dL is considered reasonable).

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

4) Diabetes management

- Evaluation

● From medical record review:

- Confirm presence or absence of diabetes in all patients.
- If a patient is known to be diabetic, identify history of complications such as findings related to heart disease; vascular disease; problems with eyes, kidneys, or feet; or autonomic or peripheral neuropathy.

● From initial patient interview:

- Obtain history of signs/symptoms related to above complications and/or reports of episodes of hypoglycemia or hyperglycemia.
- Identify physician managing diabetic condition and prescribed treatment regimen, including:
  - Medications and extent of compliance.
  - Diet and extent of compliance.
  - Blood sugar monitoring method and extent of compliance.

● Before starting exercise:

- Obtain latest fasting plasma glucose (FPG) and glycosylated hemoglobin (HbA1c).
- Consider stratifying patient to high-risk category because of the greater likelihood of exercise-induced complications.

- Interventions

● Educate patient and staff to be alert for signs/symptoms of hypoglycemia or hyperglycemia and provide appropriate assessment and interventions as per the American Diabetes Association

● In those taking insulin or insulin secretogogues:

- Avoid exercise at peak insulin times.
- Advise that insulin be injected in abdomen, not muscle to be exercised.
- Test blood sugar levels pre- and postexercise at each session:
  - if blood sugar value is <100 mg/dL, delay exercise and provide patient 15 g of carbohydrate; retest in 15 minutes; proceed if blood sugar value is >100 mg/dL.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

4) Diabetes management (continued)	
- Interventions	- if blood sugar value is >300 mg/dL, patient may exercise if he or she feels well, is adequately hydrated, and blood and/or urine ketones are negative; otherwise, contact patient's physician for further treatment. - Encourage adequate hydration to avoid effects of fluid shifts on blood sugar levels. - Caution patient that blood sugar may continue to drop for 24-48 hours after exercise. ● In those treated with diet, metformin, alpha glucosidase inhibitors, and/or thiozolidinediones, without insulin or insulin secretogogues, test blood sugar levels prior to exercise for first 6-10 sessions to assess glycemic control; exercise is generally unlikely to cause hypoglycemia. ● Education Recommendations: - Teach and practice self-monitoring skills for use during unsupervised exercise. - Refer to registered dietitian for medical nutrition therapy. - Consider referral to certified diabetic educator for skill training, medication instruction, and support groups.
- Expected Outcomes	● Short-term: - Communicate with primary physician or endocrinologist about signs/symptoms and medication adjustments. - Confirm patient's ability to recognize signs/symptoms, self-monitor blood sugar status, and self-manage activities. ● Long-term: - Attain FPG levels of 90-130 mg/dL and HbA1c <7%. - Minimize complications and reduce episodes of hypoglycemia or hyperglycemia at rest and/or with exercise. - Maintain blood pressure at <130/<80 mmHg.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

5) Tobacco cessation	
- Evaluation	● Initial Encounter: - Ask the patient about his or her smoking status and use of other tobacco products. Document status as never smoked, former smoker, current smoker (includes those who have quit in the last 12 months because of the high probability of relapse). Specify both amount of smoking (cigarettes per day) and duration of smoking (number of years). Quantify use and type of other tobacco products. Question exposure to second-hand smoke at home and at work. - Determine readiness to change by asking every smoker/tobacco user if he or she is now ready to quit. - Assess for psychosocial factors that may impede success. - Ongoing Contact: Update status at each visit during first 2 weeks of cessation, periodically thereafter.
- Interventions	● When readiness to change is not expressed, provide a brief motivational message containing the “5 Rs”: Relevance, Risks, Rewards, Roadblocks, and Repetition. ● When readiness to change is confirmed, continue with the “5 As”: Ask, Advise, Assess, Assist, and Arrange. Assist the smoker/tobacco user to set a quit date, and select appropriate treatment strategies (preparation): ***Minimal (brief):*** - Individual education and counseling by program staff supplemented by self-teaching materials. - Social support provided by physician, program staff, family and/or domestic partner; identify other smokers in the house; discuss how to engage them in the patient’s cessation efforts. - Relapse prevention: problem solving, anticipated threats, practice scenarios.

Table 4 Core components of cardiac rehabilitation/secondary prevention programs: Risk-factor management (Balady et al., 2007) (Continued)

5) Tobacco cessation (continued)	
- Interventions	***Optimal (intense):*** - Longer individual counseling or group involvement. - Pharmacological support (in concert with primary physician): nicotine replacement therapy, bupropion hydrochloride. - Supplemental strategies if desired (e.g., acupuncture, hypnosis). ● If patient has recently quit, emphasize relapse prevention skills. ● Urge avoidance of exposure to second-hand smoke at work and home.
- Expected Outcomes	● Note: Patients who continue to smoke upon enrollment are subsequently more likely to drop out of cardiac rehabilitation/secondary prevention programs. ● Short-term: Patient will demonstrate readiness to change by initially expressing decision to quit and selecting a quit date. Subsequently, patient will quit smoking and all tobacco use and adhere to pharmacological therapy (if prescribed) while practicing relapse prevention strategies; patient will resume cessation plan as quickly as possible when temporary relapse occurs. ● Long-term: Complete abstinence from smoking and use of all tobacco products for at least 12 months (maintenance) from quit date. No exposure to environmental tobacco smoke at work and home.

Table 5 Core components of cardiac rehabilitation/secondary prevention programs: Psychosocial management (Balady et al., 2007)

Psychosocial Management	
- Evaluation	● Identify psychological distress as indicated by clinically significant levels of depression, anxiety, anger or hostility, social isolation, marital/family distress, sexual dysfunction/adjustment, and substance abuse (alcohol or other psychotropic agents), using interview and/or standardized measurement tools. ● Identify use of psychotropic medications.
- Interventions	● Offer individual and/or small group education and counseling on adjustment to heart disease, stress management, and health-related lifestyle change. When possible, include family members, domestic partners, and/or significant others in such sessions. ● Develop supportive rehabilitation environment and community resources to enhance the patient's and the family's level of Social support. ● Teach and support self-help strategies.
- Interventions	● In concert with primary healthcare provider, refer patients experiencing clinically significant psychosocial distress to appropriate mental health specialists for further evaluation and treatment.
- Expected Outcomes	● Emotional well-being is indicated by the absence of clinically significant psychological distress, social isolation, or drug dependency. ● Patient demonstrates responsibility for health-related behavior change, relaxation, and other stress management skills; ability to obtain effective social support; compliance with psychotropic medications if prescribed; and reduction or elimination of alcohol, tobacco, caffeine, or other nonprescription psychoactive drugs. ● Arrange for ongoing management if important psychosocial issues are present.

Table 6 Core components of cardiac rehabilitation/secondary prevention programs: Physical activity counseling and Exercise training (Balady et al., 2007)

Physical activity counseling	
- Evaluation	● Assess current physical activity level (eg, questionnaire, pedometer) and determine domestic, occupational, and recreational needs. ● Evaluate activities relevant to age, gender, and daily life, such as driving, sexual activity, sports, gardening, and household tasks. ● Assess readiness to change behavior, self-confidence, barriers to increased physical activity, and social support in making positive changes.
- Interventions	● Provide advice, support, and counseling about physical activity needs on initial evaluation and in follow-up. Target exercise program to meet individual needs. Provide educational materials as part of counseling efforts. Consider exercise tolerance or simulated work testing for patients with heavy labor jobs. ● Consistently encourage patients to accumulate 30-60 minutes per day of moderate-intensity physical activity on ≥5 (preferably most) days of the week. Explore daily schedules to suggest how to incorporate increased activity into usual routine (e.g., parking farther away from entrances, walking ≥2 flights of stairs, and walking during lunch break). ● Advise low-impact aerobic activity to minimize risk of musculoskeletal injury. Recommend gradual increases in the volume of physical activity over time. ● Caution patients to avoid performing unaccustomed vigorous physical activity (eg, racquet sports and manual snow removal). Reassess the patient's ability to perform such activities as exercise training program progresses.

Table 6 Core components of cardiac rehabilitation/secondary prevention programs: Physical activity counseling and Exercise training (Balady et al., 2007) (Continued)

Physical activity counseling (continued)	
- Expected Outcomes	● Patient shows increased participation in domestic, occupational, and recreational activities. ● Patient shows improved psychosocial well-being, reduction in stress, facilitation of functional independence, prevention of disability, and enhancement of opportunities for independent self-care to achieve recommended goals. ● Patient shows improved aerobic fitness and body composition and lessens coronary risk-factors (particularly for the sedentary patient who has adopted a lifestyle approach to regular physical activity).
Exercise Training	
- Evaluation	● Symptom-limited exercise testing prior to participation in an exercise-based cardiac rehabilitation program is strongly recommended. The evaluation may be repeated as changes in clinical condition warrant. Test parameters should include assessment of heart rate and rhythm, signs, symptoms, ST-segment changes, hemodynamics, perceived exertion, and exercise capacity. ● On the basis of patient assessment and the exercise test if performed, risk stratify the patient to determine the level of supervision and monitoring required during exercise training. Use risk stratification schema as recommended by the AHA and the AACVPR.
- Interventions	● Develop an individualized exercise prescription for aerobic and resistance training that is based on evaluation findings, risk stratification, comorbidities (e.g., peripheral arterial disease and musculoskeletal conditions), and patient and program goals. The exercise regimen should be reviewed by the program medical director or referring physician, modified if necessary, and approved. Exercise prescription should specify frequency (F), intensity (I), duration (D), modalities (M), and progression (P).

Table 6 Core components of cardiac rehabilitation/secondary prevention programs: Physical activity counseling and Exercise training (Balady et al., 2007) (Continued)

Exercise training (continued)	
- Interventions	- For aerobic exercise: F= 3-5 days/wk; I = 50-80% of exercise capacity; D= 20-60 minutes; and M= walking, treadmill, cycling, rowing, stair climbing, arm/leg ergometry, and others using continuous or interval training as appropriate. - For resistance exercise: F= 2-3 days/wk; I = 10-15 repetitions per set to moderate fatigue; D = 1-3 sets of 8-10 different upper and lower body exercises; and M = calisthenics, elastic bands, cuff/hand weights, dumbbells, free weights, wall pulleys, or weight machines. ● Include warm-up, cool-down, and flexibility exercises in each exercise session. ● Provide progressive updates to the exercise prescription and modify further if clinical status changes. ● Supplement the formal exercise regimen with activity guidelines as outlined in the Physical Activity Counseling section of this table.
- Expected outcomes	● Patient understands safety issues during exercise, including warning signs/symptoms. ● Patient achieves increased cardiorespiratory fitness and enhanced flexibility, muscular endurance, and strength. ● Patient achieves reduced symptoms, attenuated physiologic responses to physical challenges, and improved psychosocial well-being. ● Patient achieves reduced global cardiovascular risk and mortality resulting from an overall program of cardiac rehabilitation/secondary prevention that includes exercise training.

According to the information on the tables above, the cardiac rehabilitation activities do not take place all at once, but are carried out in different time periods of the recovery process, the so-called phases. In general, the cardiac rehabilitation programs have been tailored for 3 different phases: phase I (acute stage), phase II (subacute stage), and phase III (chronic stage) (Fridlund, 2002).

The first phase includes all the rehabilitative actions that are made in the hospital. The second phase starts when the individual leaves hospital. It covers the following 3–6 months until the patient is more physically independent and can start the long-term life changes needed. The third phase covers the rest of a person's life. It focuses on retaining and maintaining physical and psychological ability as well as avoiding risk-factors in the individual's life style (Fridlund, 2002).

Cardiac rehabilitation phase II for persons with MI

Why persons with MI are in need of cardiac rehabilitation phase II?

Experiencing an MI is conceptually viewed as a transition that reflects movement along the health-illness continuum. An individual has to be admitted in the hospital and is in need of extensive care from health care providers. When the illness condition of the person is better, an MI individual needs recovery after experiencing MI and has to return to normal functioning. It is a change from hospital setting to their own resident that the facilitating resources are different from the hospital. Normally, persons with MI need the intervention that can help them to optimize physical, psychological, and social functioning, to stabilizing, slowing, or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality.

The Self-efficacy Enhancement for Cardiac Rehabilitation (SECR Program) is developed and conceptualized as preventive intervention, as occurring before the consequences. The SECR Program conjuncts with cardiac rehabilitation Phase II program that is the transitional phase of cardiac rehabilitation after persons with MI leave the hospital. Most cardiac rehabilitation in this phase is based upon supervised ambulatory outpatient programs conducted during convalescence. Attendance begins soon after discharge from hospital, ideally within the first few days (Goble & w0rcester, 1999). In Thailand and elsewhere, cardiac rehabilitation program phase II usually end within two to three months of the acute event. The cardiac rehabilitation Phase II program usually involves an exercise component (home activity and/or supervised exercise sessions), education sessions, including understanding of the disease process, treatment, risk-factors, nutrition and guidelines for resumption of physical, sexual and daily living activities, including work and psychosocial support. This can either be conducted within group settings or with an individual or family (New Zealand Guidelines Group [NZGG], 2002).

The role of the nurse in cardiac rehabilitation programs (Fridlund, 2002)

In hospital based cardiac rehabilitation (phase 1) concerns the individual level and focuses on information and physical mobilization. Here, the nurse has the function of container (i.e. being a good listener and an active receiver) and counsellor for patients and their families. Phase 2 starts after discharge and focuses on education as well as supporting necessary lifestyle changes at group level. Here, the nurse's role is that of coach and educator. In phase 3 focuses on education and supporting lifestyle changes at group level (support groups) or at individual level (regular follow-ups) with the aim of maintaining a healthy lifestyle. Here, the nurse's

role is to continue as a coach and as an educator. The coaching and educating roles of the nurse in phases 2 and 3 (support and follow-ups) are also to be found in the institutional led by patient organizations, insurance companies, as well as spa and fitness companies. This takes place at individual and group level with focus on education as well as supporting lifestyle changes and maintaining a healthy lifestyle. Furthermore, the role encompasses being a mediator and a supervisor of other healthcare professionals during phases I and II as well as continuing the supervision during phase III. This in order to make the program an effective tool by which the psychosocial knowledge related to the cardiac event is enhanced, especially in terms of the learning and educational needs of the patient and family. However, how these multiple roles should be managed, in order to reach patient and family compliance depends on the educational principles applied, e.g. individualization, feedback, facilitation, relevance and reinforcement. The nurse has to see the patient behind the disease, i.e. understand the patient's and family's needs and behavior. Responding to the needs of the whole family is one way of showing respect, which should be followed by finding out the resources needed to make participation in a cardiac rehabilitation program comprehensible and practical to the patient and family. A good relationship between the nurse and family, i.e. based on equality and reasonable knowledge, is a fruitful basis for empowering them to adopt an open-minded attitude and motivating them for a life style change. This is possible due to the fact that a change of lifestyle begins with dissatisfaction with the self, e.g. smoking and suffering an acute myocardial infarction, and that a state of mind becomes an obsession overshadowing everything else. Such a life situation raises a strong and conscious motive for change and an expressed will to make it happen. An

important factor in this situation is that fear and anxiety, caused by the life threatening disease, influence the patient to undertake a change, but only temporarily, which is the reason why various forms of social support are necessary, in order to maintain a lifestyle change in the long term.

In conclusion, the conditions which make up the nurse's optimal role in implementing effective cardiac rehabilitation can be summed up as having a four-fold comprehensive perspective of the cardiac rehabilitation concept; (1) describing the disease and health from an impact perspective of both influencing or triggering risk and health factors, (2) understanding the patient in relation to a time perspective, looking for the 'perfect day' for influencing and motivating a lifestyle change as well as supporting and empowering the maintenance of a healthy lifestyle by means of the life-long follow-ups; (3) interpreting the patient from a lifespan perspective comprising biophysical, intellectual, emotional, existential and socio-cultural dimensions of the human being, and last but not least, and (4) knowing and understanding oneself as a nurse from a personal perspective both as an individual and as a professional.

Existing Intervention for Improving Functional Status

Cardiac rehabilitation programs have been proposed as intervention to improve functional status in persons with MI. This section presents a review of studies about effects of cardiac rehabilitation programs on functional status. The details are as following.

Yoshida et al. (2001) designed a hospitalized phase II cardiac rehabilitation program to evaluate the physical and psychological status of 85 MI patients. The

intervention consisted of exercise training, education and counseling. Duration of intervention was 2 weeks, meanwhile length of follow-up was 1, 6, and 12 months. The results showed that after participation in the program, the exercise tolerance, serum lipid profiles and STAI anxiety score of the MI patients were improved significantly and at the 6-month follow-up these parameters remained improved and regular physical activity was maintained. The quality of life score also improved significantly. Even at the 12-month follow-up, lipid profiles remained improved and regular physical activity was maintained.

Seki et al. (2003) evaluated the effects of a comprehensive outpatient cardiac rehabilitation program on health-related quality of life in 38 elderly MI patients. The intervention of this study consisted of exercise, diet advice, and education. Duration of intervention was 6 months, meanwhile length of follow-up was also 6 months. Validated questionnaires were obtained to evaluate health related quality of life (HRQOL) using the Medical Outcome Study Short-Form 36 Health Status Survey (SF-36). The results showed that after 6 months, in the intervention group, scores of physical function, physical role functioning, and emotional role functioning improved significantly compared with a baseline. In the control group, none of the parameters significantly changed.

Yu, Li, Ho, and Lau (2003) conducted a cardiac rehabilitation program in 112 obese patients after acute MI or PCI. The intervention of this study consisted of an exercise program with group education classes about risk-factor modification. Duration of intervention was 2.5 months, meanwhile length of follow-up was also 2.5 months. The Medical Outcome Study Short-Form 36 Health Status Survey (SF-36) was used to measure functional status. The results showed that in the intervention

group, scores of physical function, physical role functioning, and emotional role functioning improved significantly compared with a baseline. In the control group, none of the parameters significantly changed.

Marchionni et al. (2003) conducted a randomized controlled trial of a cardiac rehabilitation program in 270 MI patients. The intervention consisted of supervised exercise training and education or counseling about risk-factor management, with optional monthly support groups. Duration of intervention was 2 months, meanwhile length of follow-up was 12 months. The cycle ergometry and Sickness Impact Profile were used to measure functional status. The results showed that after 6 and12 months of cardiac rehabilitation, functional capacity and activities of daily living improved with Hospital- cardiac rehabilitation and Home- cardiac rehabilitation and were unchanged with no cardiac rehabilitation.

Hevey et al. (2003) designed a multifactorial rehabilitation program to evaluate exercise capacity and quality of life in 60 MI patients, who were randomly assigned to either a standard 10-week (30 sessions) or a 4-week (20 sessions) course. The intervention consisted of exercise training, education, and counseling. The length of follow-up was 6 months. The results showed that cardiac rehabilitation significantly improved exercise capacity and general health and well-being. No significant differences were detected between groups undergoing a 10-week or 4-week course.

Pasquali, Alexander, Coombs, Lytle, and Peterson (2003) studied the effect of cardiac rehabilitation on physical functioning in 700 MI patients. The intervention consisted of exercise training, education, and counseling. The length of follow-up was 6 months. The results showed that overall cardiac rehabilitation participation was

24%. Cardiac rehabilitation was associated with significant improvement in 6-month PF. This improvement was observed in all patient subgroups but tended to be greater in magnitude in men versus women, patients aged < 70 years versus ≥ 70 years, and patients with coronary bypass grafting versus patients with percutaneous intervention. Cardiac rehabilitation participants also tended to be more likely to engage in regular exercise (63% vs. 55%, p = .06) and modify their diet (82% vs 73%, p = .07). Rates of rehospitalization and repeat revascularization were similar among cardiac rehabilitation participants and nonparticipants.

Warrington, Cholowski, and Peters (2003) conducted a quasi-experimental design to evaluate the effectiveness of a home-based cardiac rehabilitation program in improving health outcomes and rehabilitation access for special-needs patients in 40 elderly MI patients. Duration of intervention was 9 weeks, and length of follow-up was 12 weeks. The results showed that significant positive changes were found for functional status and knowledge of angina. Additionally, the higher levels of participation and completion by older women were encouraging. Development of caregiver competence through an improved knowledge base and nursing support was also evident.

Kardis, Bruce, Michaels, and Barnett (2005) evaluated phase II cardiac rehabilitation on functional status in 302 MI patients. The intervention of this study followed American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) guidelines and had a multidisciplinary staff including both bachelor- and master's-prepared nurses, exercise physiologists, a dietician, a social worker, and smoking cessation and stress management counselors. Duration of intervention was 2 to 4 weeks for post MI patients and 6 weeks for cardiac surgery MI patients, and

length of follow-up was 3 months. The results showed that after 3 months, subjects improved functional status and the greatest gains were in fitness (22.5%, $p < .0001$) and daily activities (24.4%, $p < .0001$).

Aude, Hill, and Anderson (2006), using secondary data, evaluated phase II cardiac rehabilitation on functional status in 121 patients. The results showed that after cardiac rehabilitation, the post scores of physical, role, and social functioning were higher when compared to the pre-rehabilitation scores.

Moghadam, Tavakol, Hadian, Bagheri, and Jalaei (2009) evaluated the effect of phase II cardiac rehabilitation on the functional capacity, muscle strength, serum lipids and blood pressure of 88 MI patients after CABG. The intervention consisted of combined aerobic and strengthening exercises. The results showed that the combined exercise protocols improved the functional capacity and muscle strength to a significantly greater extent than the aerobic protocol.

Beckie and Beckstead (2010) conducted a randomized clinical trial to evaluate the effects of a cardiac rehabilitation program tailored for women on global quality of life. The intervention consisted of exercise training, education and counseling. Duration of intervention was 12 weeks, and length of follow-up was 6 months. Two methods of CR program tested differential improvements on QOL to a sample of 225 women were: (1) a traditional CR program that included men as well as women in the sessions or (2) a tailored 225 women-only CR program that included motivational interviewing guided by the transtheoretical model of behavior change. The results showed that the group of women who participated in the tailored program had greater improvement in their physical functioning scores than the women allocated to the traditional CR program, and physical functioning

improvements were sustained at the 6-month follow-up assessment among those in the tailored group but not those in the traditional program.

Extensive evidence by Clark, Hartling, Vandermeer, and McAlister (2005) conducted the meta-analysis of 63 randomized trials of secondary prevention programs in 21,295 patients with coronary artery disease. Secondary prevention programs included 1) comprehensive cardiac rehabilitation programs that included education or counseling with a structured exercise component, 2) programs that included education or counseling without a structured exercise component, and 3) programs with a supervised exercise program only. The results showed that most of these programs could reduce subsequent MI and mortality and the effect sizes were moderate and high. In addition, these programs also improved functional status, but effect sizes were small. Similarly, Taylor et al. (2004) conducted a systematic review and meta-analysis of 48 randomized controlled trials of exercise-based rehabilitation with a total of 8,940 patients with coronary heart disease. Trials with 6 or more months of follow-up were included if they assessed the effects of exercise training alone or in combination with psychological or educational interventions. The results showed that cardiac rehabilitation was associated with reduced all-cause mortality and cardiac mortality greater reductions in total cholesterol level triglyceride level and systolic blood pressure and lower rates of self-reported smoking. However, there were no significant differences in the health-related quality of life or functional status improved between cardiac rehabilitation and usual care. Moreover, Jolliffe et al. (2004) conducted systematic reviews that included 48 randomized controlled trials (RCTs) of exercise-based rehabilitation for coronary heart disease that showed that a 20% reduction in all causes mortality and a 27% reduction in cardiac mortality at 2-5

years. This review concluded that exercise-based cardiac rehabilitation is effective in reducing cardiac deaths, cardiovascular morbidity and primary risk-factors in patients who have had myocardial infarction (MI). However, there were no significant differences in the health-related quality of life or functional status.

More interesting, the focus of these cardiac rehabilitation programs commonly considers physical and/or medical factors that influence the performance of functional activities, and those programs pay much less attention to the psychological factors. As the result, most of those programs can reduce subsequent MI and mortality with the moderate and high effect sizes, but for improving functional status accounting to behavior change, the effect sizes are small (Clark et al., 2005) and no significant differences of functional status are reported (Jolliffe et al., 2004; Taylor et al., 2004). To improve functional status, it requires more than a physical or medical regimen in cardiac rehabilitation guidelines. Behavior change is known to be influenced by reciprocal relationships between personal factors, environmental factors, and behavior (Bandura, 1997). Therefore, conducting cardiac rehabilitation program focused on the psychosocial aspect in terms of cognitive change underpinning the cognitive behavior theoretical framework may be the best way for improving functional status in persons with MI.

Self-efficacy enhancement program in facilitating of cardiac rehabilitation

Changes in self-efficacy have been studied in randomized clinical trials in cardiac rehabilitation programs. Carlson et al. (2001) tested a modified cardiac rehabilitation program based on Bandura's self-efficacy theory and designed to enhance the patient's confidence to engage in independent exercise. Self-efficacy

was found to be a significant predictor of independent exercise. The findings supported individualization of cardiac rehabilitation programs that promoted self-efficacy. Dougherty et al. (2004) conducted a nursing intervention based on social cognition theory designed to improve physical functioning and psychological adjustment in heart disease patients after ICD implantation. The three part program consisted of an informational booklet, nursing telephone support using a protocol, and nurse pagers. The findings showed that the intervention could enhance self-confidence and reduce emotional distress.

In addition, Carroll et al. (2001) described advanced practice nurse (APN) interventions based on social cognition theory and designed to influence self-efficacy in elders after myocardial infarction. The APN activities included patient education, validation/feedback, encouragement/support, and problem solving. Activities to enhance self-efficacy expectation for recovery behaviors were emphasized. Similarly, Hiltunen et al. (2005) described APN intervention strategies utilized from the Nursing Interventions Classification (NIC) based on social cognitive theory and implemented to influence self-efficacy in elders after myocardial infarction and coronary artery bypass grafting in communities. The findings showed that verbal encouragement and mastery were self-efficacy enhancement interventions used with the greatest number of participants. Exercise promotion, energy management and active listening were the NIC interventions used with the most participants. Song (2003) conducted a self-efficacy promoting cardiac rehabilitation program based on Bandura's self-efficacy theory. The program was designed to enhance self-efficacy with four self-efficacy sources including performance accomplishment, vicarious experiences, verbal persuasion and physical status. The program consisted of two individualized in-

hospital education sessions and four weekly telephone counseling follow-up calls after discharge. The findings showed that 4 weeks after discharge, the increment of total self-efficacy score was significantly higher in the experimental group than in the control group ($p < .01$). There was also a significant difference in the total quality of life scores increments between the two groups ($p < .01$).

For Thai studies in heart patients, Churgedton (2001) conducted a quasi-experimental research aimed at examining the effect of the self-efficacy enhancement on activities of daily living (ADL) among 20 patients undergoing coronary artery bypass graft surgery. The program consisted of exercise training, providing symbolic modeling via video, health education by giving lesson and booklet, home visit, and family support. The results revealed that after discharge 2 weeks, the treatment group had significantly higher ADL than the control group ($p < .01$), and the treatment group had significantly higher self-efficacy than the control group ($p < .01$). Ashton et al. (2008) conducted a quasi-experimental research aimed at examining the effect of the self-efficacy and social support enhancement program on exercise behavior among thirty elderly with post percutaneous intervention (PCI). The program consisted of exercise training, providing symbolic modeling via video, health education by giving lesson and booklet, home visit, and family support. The results of the study revealed that the exercise behavior scores of the experimental group were statistically significantly higher than the control group ($p < .001$).

Witwaranukool and Jitpanya (2009) conducted quasi-experimental research aimed at examining effects of self-efficacy and an outcome expectancy promoting program on functional capacity of congestive heart failure patients. The major findings showed that the functional capacity of congestive heart failure patients after

receiving the program was significantly higher than that before receiving the program at the .05 level. In addition, the functional capacity of congestive heart failure patients after receiving the program was significantly higher than those who received routine nursing care at the .05 level. Dakhunthod (2006) conducted a quasi-experimental research aimed at examining the effect of self-efficacy cardiac rehabilitation program on the exercise and activity in coronary artery disease patients. The program consisted of exercise training, education, counseling and psychosocial support during hospitalization and home visit once a week for 8 weeks. The results of the study revealed that the exercise and activity scores of the experimental group in inpatient phase were statistically significantly higher than the control group ($p < .05$) and the exercise and activity scores of the experimental group in outpatient phase were also statistically significantly higher than the control group ($p < .05$).

Intarakamhang and Intarakamhang (2013) conducted a quasi-experimental research with a repeated one group design aimed at examining the effect of the Comprehensive Cardiac Rehabilitation Program on self-efficacy, self-regulation, self-care, body mass index and quality of life of the patients with coronary heart disease during early stages following hospitalization. The Comprehensive Cardiac Rehabilitation Program, which integrated psychological and educational intervention, included attending exercising practice, receiving face-to-face counseling while being admitted to the hospital, delivering health advice to the participants via a telephone call one week after being discharged from the hospital, and receiving individual or group counseling at the Cardiac Rehabilitation Clinic at 2 weeks after discharging. The results of the study revealed that by 6 weeks, 50%, 58.80%, 46.20%, and 72.50% of patients, respectively, had experienced increases with self-efficacy, self-regulation,

self-care, and quality of life scores, while 12.50% of patients had decreased their body mass index in comparison with the pretest score. From the paired t-test, the self-efficacy, self-regulation and quality of life scores were statistically significant, having increased to the $p<0.01$ level; self-care was statistically significant, having increased to the $p<0.05$ level along with body mass index, which was statistically significant having experienced a decrease to the $p<0.01$ level.

In conclusion, self-efficacy enhancement programs are used in various heart disease populations in both western and Thai studies. Although the content, intensity, and efficacy of self-efficacy enhancement programs are different within various chronic illnesses, the main concepts of intervention are similar, that is, enhancing human capability by using major sources of information based on self-efficacy theory. More interesting, most studies emphasize self-efficacy enhancement, but there is a lack of information about self-efficacy enhancement for cardiac rehabilitation during the first month after discharge of persons with MI receiving medical therapy. In order to address these gaps of knowledge, it is important to develop the intervention, called the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program), and examine its effectiveness on functional status outcome in those persons.

Development of the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program)

The SECR Program was conducted aimed at improving functional status in persons with MI through enhancing self-efficacy for cardiac rehabilitation and having collaboration of family members to provide support to persons with MI. The social cognitive theory (SCT) was used as a theoretical framework to understand the behavior change related to functional status (Bandura, 1986, 1997). Self-efficacy concept in the SCT (Bandura, 1997) and social support proposed by House (1981) were used to tailor intervention, while the Cardiac Rehabilitation Guideline 2010 (The Heart Association of Thailand under the Royal Patronage of H.M. the King, 2010), and existing knowledge about cardiac rehabilitation (Ainsworth et al., 2000; Balady et al., 2007; Global & Worcester, 1999) were used to develop the content of the program.

The SECR Program emphasizes the cardiac rehabilitation during 4 weeks after discharge including four core elements: 1) patient assessment, 2) individualized education and counselling; 3) attending the walking exercise and performance of daily activities; and 4) psychosocial management. The details of each element are as follows.

The patient assessment and health education and counselling were conducted by the researcher based on the recommendation of the AHA/ACC secondary prevention guidelines (Balady et al., 2007) and a broader literature review about cardiac rehabilitation. The activities of patient assessment include the evaluation of medical history and physical examination, while the individualized education and counselling involved receiving face-to-face education and counseling sessions while being admitted at the hospital and delivering health advice and

counselling to the persons with MI via a telephone call using a protocol once a week after being discharged from the hospital. The content of individualized education and counselling is about knowledge about MI, walking exercise and performance of daily activities, healthy eating, risk-factor management, symptom management, and medication taking.

The walking exercise intervention was a home-based walking program to improve exercise of the persons with MI receiving medical therapy. The walking program was designed to increase adherence and acceptability by incorporating important Thai cultural components and values related to family, spirituality, literacy, and economic issues. The Heart Association of Thailand under the Royal Patronage of H.M. the king (2010) recommends that to get safety and adequate beneficial effects on cardiorespiratory fitness during the 4 weeks after discharge, the frequency, intensity, and duration of walking exercise intervention should increase step by step. The detail of the walking program is shown in Table 7.

Table 7 Structure of the walking exercise program

Week	Walking			Aim of the walking
	frequency	duration	intensity	
1	2 times/day, at least 3-5 days/week	5-10 min.	Borg scale (score 11-13)	1. encourage persons with MI to improve compliance to the walking exercise program. 2. increase aerobic capacity and improve fitness level.
2	2 times/day, at least 3-5 days/week	10-15 min.	Borg scale (score 11-13)	
3	2 times/day, at least 3-5 days/week	15-20 min.	Borg scale (score 11-13)	
4	1 times/day, at least 3-5 days/week	25-30 min.	Borg scale (score 11-13)	

The performance of daily activities refers to basic, instrumental, and advance daily activities which require amounts of energy at low-intensity level to a moderate-intensity level (< 3-6 metabolic equivalents [METs]). The sets of physical activities with detailed METs and description were selected from the Compendium of Physical Activities (Ainsworth et al., 2000) fitted into Thai household chores, occupations, and religious activities.

The psychosocial management focuses on self-symptom management and promoting family support. Here, the self-symptom management concerns chest pain management and stress management based on the recommendation of the AHA/ACC secondary prevention guidelines (Balady et al., 2007) and a broader literature review about these symptom management, while family member has the function of supporter to provide the persons with MI support in engaging in all elements of cardiac rehabilitation.

In this study, the persons that have experienced an MI were promoted to engage in the four elements of cardiac rehabilitation through self-efficacy enhancement for cardiac rehabilitation. Four major sources of information (i.e., enactive mastery experience, vicarious experience, verbal persuasion, and reinterpretation of symptoms) based on self-efficacy theory (Bandura, 1986, 1997) were used as the significant strategies to enhance the self-efficacy in an MI individual. The activities of these four strategies were developed based on the specific activities of self-efficacy enhancement documented by Hiltunen et al. (2005). Those activities were identified and pulled from case examples and the literature based on thirty-one interventions from the Nursing Interventions Classification [NIC] (McCloskey &

Bulecheck, 2000). The summary of the specific activities of self-efficacy enhancement is shown in Figure 4.

Mastery

- Discuss physical activities currently performed and capabilities from the past.
- Assist with specific short- and long-term goal setting.
- Give feedback for achieving short-term goals.
- Use diary and/or pedometer to monitor progress.
- Remind person of strengths from past experiences.

Vicarious Experience

- Expose to similar others who have successfully recovered.
- Give examples from nurse's practice.
- Provide anticipatory guidance to reduce barriers.

Verbal Encouragement (Verbal Persuasion)

- Focus on progress.
- Give support and encouragement, "cheerleading."
- Review expected progress based on cardiac guidelines.
- Identify strategies on how to achieve goals.

Reinterpretation of Symptoms (physiologic and emotional states; physiologic feedback)

- Help to reframe symptoms and how they may be a part of recovery process.
- Correct false or unrealistic expectations and interpretations.
- Reduce stressors through stress management techniques.
- Provide information on recovery process.

Figure 4 Specific activities of self-efficacy enhancement (Hiltunen et al., 2005)

The specific activities of self-efficacy enhancement stated by Hiltunen et al. (2005) were applied to the activities of self-efficacy enhancement for cardiac rehabilitation in the present study as follows.

Enactive mastery experience is defined as learning self-efficacy through personal experience or actual performance accomplishments. The nursing activities include: 1) assisting with specific short- and long-term goal setting; 2) providing skill training about a) activity prescription, b) symptoms management, and c) self-recording and evaluation in a diary; 3) using a diary to monitor the progress of the walking exercise and performance of daily activities; 4) discussion about the practices for cardiac rehabilitation currently performed; and 5) giving feedback for achieving short-term goals.

Vicarious experience is defined as raising and strengthening perceived self-efficacy by observing and/or sharing the performances of similar others. The person with MI was exposed to others similar to himself/herself that have successfully recovered. This exposure involved observing a role model.

Verbal persuasion is defined as any verbal persuasive information conveyed to an MI individual by the researcher or family members. The nursing activities include: 1) providing information on the recovery process through individual health education; 2) identifying strategies on how to achieve goals; 3) providing guidance to reduce barriers of practices; 4) reviewing expected progress based on short- and long-term goals; 5) focusing on progress; and 6) giving verbal support and encouragement, "cheerleading."

Reinterpretation of symptoms (physiological and emotional states) is defined as learning to realistically judge one's physical or emotional state and the ability to reach goals. The nursing activities included: 1) encouraging the participant to reduce stressors through stress management techniques; 2) promoting the sharing of symptoms experience of persons with MI; 3) helping to reframe symptoms and explanation how they may be a part of the recovery process; and 4) correcting false or unrealistic expectations and interpretations.

As mention previously, not only does self-efficacy has potential influence on behavioral change related to functional status, but family support is also an important influence. In this study, family support for the persons with MI was integrated into the program, along with the four major sources of information in order to achieve the ultimate of self-efficacy. Family members, in particular significant caregivers in a family, were involved in the program by providing emotional, appraisal, informational, and instrumental supports based on the social support concept by House (1981).

The social support concept proposed by House (1981) was derived to the specific nursing activities for promoting family support in the present study as follows.

1) Emotional support: 1) encourage family members to engage with persons with MI in all of the activities of self-efficacy learning; 2) encourage family members to give positive verbal support and encouragement, "cheerleading," to persons with MI;

2) Information support: discuss how to provide informational support for persons with MI at home;

3) Appraisal support: train individuals in how to validate and provide feedback on the practices of persons with MI at home;

4) Instrumental support: discuss how to provide instrumental support for persons with MI at home.

All these activities that derived from self-efficacy theory (Bandura, 1997) and social support concept (House, 1981) could be used to build the structure of the SECR program that consisted of three components: 1) motivation-building activities in increasing the practices of cardiac rehabilitation; 2) skill training for cardiac rehabilitation; and 3) monitoring of the practices of cardiac rehabilitation. These three components of the SECR Program covered four sessions (three hospital visits and three telephone calls) during 4 weeks after admission. The details of the program implementation can be found in Chapter 3.

CHAPTER III

METHODOLOGY

This chapter provides a description of the research methodology used in this study including the research design, population and sample, sampling procedure, research instruments, protection of the rights of human subjects, intervention procedures, data collection, and data management and analyses.

Research Design

This study used the two-group randomized controlled trial with pretest/posttest design. Participants were randomly assigned to either an experimental or a control group. The participants in the experimental group participated in the Self-efficacy Enhancement for Cardiac Rehabilitation (SECR Program) and received the usual care, while the participants in the control group received the usual care and were given a booklet. This research design diagram is shown in Figure 5.

R	Experimental group	O_1	X	O_2
	Control group	O_3		O_4

Figure 5 Two-group randomized controlled trial with pretest/posttest design

R = Random assignment
O_1 = Pretest in the experimental group on the 2nd day of admission
O_2 = Posttest in the experimental group at the 4th week after discharge
O_3 = Pretest in the control group on the 2nd day of admission
O_4 = Posttest in the control group at the 4th week after discharge
X = Experimental intervention: the SECR Program

Population and Sample

The target population of this study was persons with MI of all ages, both male and female, admitted to hospital and received only medical therapy.

The sample was persons with an MI of all ages and both male and female, admitted to the medical wards at Maha Sarakham Hospital, Maha Sarakham Province, in the northeastern region of Thailand and received only medical therapy.

Recruitment

The participants were purposively selected into study based on the inclusion criteria. The inclusion criteria of the participants were persons that:

1) were diagnosed either with an ST-elevation MI (STEMI) or a non ST-elevation MI (NSTEMI) by medical doctor or a cardiologist based on symptom occurrence, cardiac biomarker, and ischemic electrocardiographic changes;

2) were classified as low risk person with MI based on the recommendation of the American Association of Cardiovascular and Pulmonary Rehabilitation (AACPR) (2012) including no complex dysrhythmias, uncomplicated cardiac event, or absence of clinical depression;

3) had not any complications that could influence daily activity performance such as congestive heart failure, uncontrolled hypertension (systolic BP > 180 mmHg and/or diastolic BP > 110 mmHg), uncontrolled hypotension (diastolic BP < 65 mmHg), uncontrolled diabetes mellitus (FBS > 300 mg%/ 16.7 mmol/L);

4) had not any chronic diseases in vital organs such as the lungs, liver, or kidneys;

5) had not any physical problems (e.g., musculoskeletal, neurological, or rheumatic diseases with functional impairment) or any mental problems (e.g., psychosis, neurosis);

6) had at least one family caregiver;

7) had an ability to read and write Thai language;

8) were willing to participate in the study.

The criteria for exclusion of the participants from the study included:

1) withdrawing from the study at any time;

2) readmission with an MI, any complications (e.g., congestive heart failure, hypertension, diabetes mellitus, renal failure), or any health problems.

Sample size

The sample size of participants for this study was calculated based on the power analysis and effect size determinations. The significance criteria was set =.05, power = .80 based on the accepted value of power (Cohen, 1988; Polit & Beck, 2006), and effect size (*d*) = 0.75. This effect size came from a previous study (Caliani et al., 2004) based on self-efficacy theory and which had characteristics of samples and outcome measures which were similar to this study. According to a table of sample sizes (Cohen, 1988), 30 cases in each group would be sufficient for a comparison of differences between the experimental and control groups. In addition, because an attrition rate of 10% from the previous Thai study was anticipated (Dakhunthod, 2006), the sample size added three participants per group. Therefore, the total sample size needed for this study should be 66.

Setting

The study took place in the medical wards during the participants' hospitalizations and in the medical out-patient department at 4 weeks after discharge, at Maha Sarakham Hospital, Maha Sarakham Province, in the northeastern region of Thailand. Maha Sarakham Hospital, located 295 miles (475 kilometers) outside of the Bangkok metropolitan area, is a provincial hospital under the government of the Ministry of Public Health, consisting of 472 beds and providing an intermediate level of health care for MI patients including diagnosis and medical therapy. The average length of a hospital stay of MI patients receiving medical therapy is 3-5 days. The medical out-patient department is open every day from 8:00 a.m. to 4:00 p.m.

Sampling Procedure

Enrollment

A total of 94 persons with MI admitted at medical wards, Maha Sarakham Hospital were assessed for eligibility. Sixty-six participants that met the inclusion criteria were approached for recruitment into the study, while 28 participants were excluded for not meeting the inclusion criteria. Each participant received a brief overview of the study presented by the researcher and was encouraged to ask questions throughout and at the conclusion. The researcher reviewed the consent form with the individual. All of them agreed to participate in this study and signed the study consent form (see Appendix D). After that, they completed the baseline assessments and then were randomized into either the experimental or control group.

Random assignment

The participants were randomly assigned into either the experimental or control group. To minimize the risk of predicting the treatment assignment of the next eligible participant, randomization was performed in permuted blocks of four with random order of the blocking number.

The randomization was carried out by having a piece of paper that contains just “Experimental (E)” or “Control (C)” placed inside an envelope with six different possible ways (EECC, ECEC, CEEC, CECE, CCEE, and ECCE). On the outside of the envelopes the sequence blocking number (number 1, 2, 3, 4, 5, and 6) was placed. Using consecutively numbered, sealed, opaque envelopes constructed by an individual not involved in this study, the researcher and the participant opened the sealed envelope to reveal the group allocation.

The first block was created once the first participant was enrolled into the study. The researcher used draw technique to randomly select one of the six types of block. After that, the first, second, third, and fourth participant were allocated to either the experimental or control group based on selected block. For the next blocks, the researcher continually used draw technique to randomly select one of the six types of block and then created allocations for every four of participant until the last participant was enrolled into the study.

In this study the sample consisted of 66 participants. Each participant was randomly assigned to either the experimental group or control group. Thirty-three participants were in the experimental group and the other 33 were in the control group. During follow-up, in the experimental group, one participant was referred to another tertiary care site for advance treatment and one participant could not

continue walking exercise, while in control group two participants were readmission and one participant was referred to another tertiary care site for advance treatment. Therefore, 31 participants were in the experimental group and 30 participants were in the control group. The summary of sampling and flow of participants through a randomized clinical trial is shown in Figure 6.

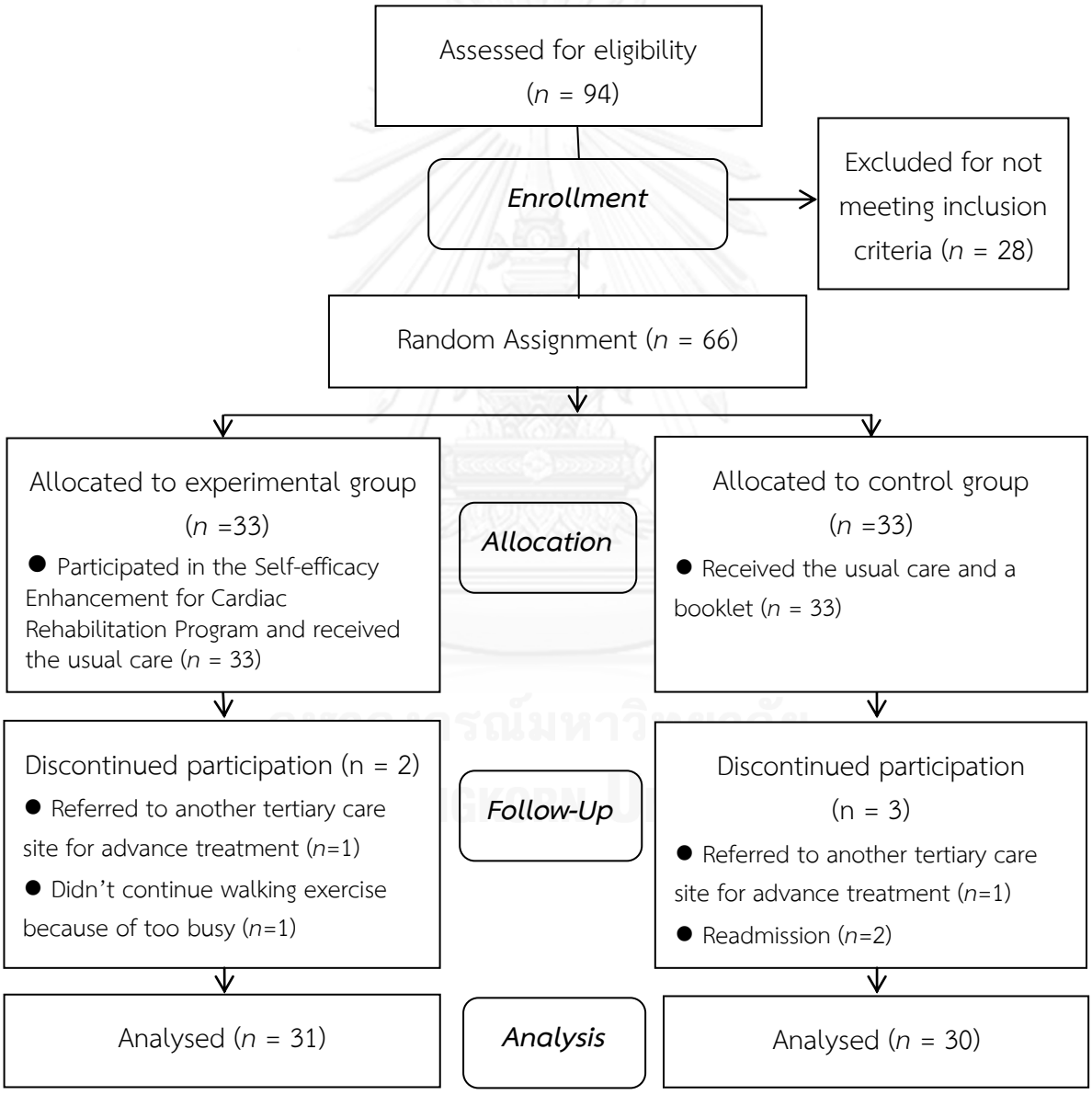

Figure 6 Sampling and flow of participants through a randomized clinical trial

Research Instruments

The research instruments in this study comprised three types: 1) data collection instruments; 2) intervention instruments; and 3) experimental validity check instruments. The detail of each instrument is described as follows:

1. Data collection instruments

Data collection instruments in this study comprised: 1) patient's characteristics data form; and 2) functional status measure. The summary of data collection instruments is shown in Table 8.

Table 8 Data collection instruments and timing of administration

Data collection instruments	Timing of administration	
	Pretest (2nd day of admission)	Posttest (wk#4 after discharge)
- patient's characteristics data form	X	
- Functional status measure: DASI-T	X	X

Note. DASI-T = The Thai version of the Duke Activity Status Index

1.1 Patient's characteristics data form

Patient's characteristics data form included three parts (Appendix E). First, participants were asked for demographic characteristics including age, gender, marital status, educational achievement, occupation, employment status, family income, patient-perceived level of income, health insurance, significant caregiver. Second, the participants were asked about clinical characteristics including history of disease risk-factors (i.e., hypertension, diabetes mellitus, and dyslipidemia), smoking history, exercise habit, and eating behavior of high saturated fat and cholesterol food. Third, clinical characteristics of the participants obtained from medical records review

included diagnosis, body mass index (BMI), systolic blood pressure, total cholesterol level, LDL cholesterol level, blood sugar level, and length of stay of admission.

1.2 Functional status measure

Functional status measure in this study was the Thai version of the Duke Activity Status Index [DASI-T] (Appendix E). The Duke Activity Status Index (DASI) was developed by Hlatky et al. (1989) based on exercise testing with measurement of peak oxygen uptake, a structured interview about the subject's ability to perform a variety of common daily activities, and an extensive review of the literature. A 12-item scale of the DASI was developed by (1) taking into account the empirical correlations of questionnaire items with peak oxygen uptake, and (2) clinical judgment and information from previous studies about the activities best representing different aspects of physical functioning. The items in the index represented by four major spheres of activity: personal care, ambulation, household tasks, sexual function and recreation. Within each sphere of activity, stepwise multiple regression analyses were used to identify the questionnaire items that best correlated with peak oxygen uptake (Spearman correlation coefficient = .80). Weighting of items in the index was based on the known metabolic cost of each activity in metabolic equivalent (MET) units, with adjustments for rounding and maximizing empirical correlations.

The final instrument, the DASI, was then tested in an independent sample. Fifty subjects undergoing exercise testing with measurement of oxygen uptake were asked to complete a self-administered questionnaire. The DASI correlated significantly ($p < .000l$) with peak oxygen uptake (Spearman correlation coefficient = .58) in this independent sample (Hlatky et al., 1989). Further studies have supported

the validation of the DASI in various populations (Carter et al., 2002; Kaul et al., 2009; Mantziari et al., 2013; Ravani et al., 2012).

The DASI is a self-administered 12-item measure (see Table 9). There are four major activity domains: personal care, ambulation, household tasks, sexual function and recreation. Each person is asked whether he or she can perform each activity. The response format for this is Yes/No. If the respondent state "Yes," that item is assigned a weighted score based on the known metabolic cost of each activity. The range for activity value is 1.75-8.0. If the respondent states "No," that he/she cannot perform on that activity, the weighted score is zero. The potential range of the sum score is 0-58.2: 0 = worst, 58.2 = best (Hlatky et al., 1989).

Table 9 The Duke Activity Status Index (Hlatky et al., 1989)

Activity: Can You. . .	Yes	No	Weight (MET)
1. take care of yourself, that is, eating dressing, bathing or using the toilet?			2.75
2. walk indoor, such as around your house?			1.75
3. walk a block or 2 on level ground?			2.75
4. climb a flight of stairs or walk up a hill?			5.50
5. run a short distance?			8.00
6. do light work around the house like dusting or washing dishes?			2.70
7. do moderate work around the house like vacuuming, sweeping floors, or carrying in groceries?			3.50
8. do heavy work around the house like scrubbing floors or lifting or moving heavy furniture?			8.00
9. do yard work like raking leaves, weeding, or pushing a power mower?			4.50
10. have sexual relations?			5.25
11. participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?			6.00
12. participate in strenuous sports like swimming, singles tennis, football, basketball, or skiing?			7.50

The sum score of the DASI can be used to estimate the person's functional status in term of functional capacity by calculated to peak oxygen uptake (VO_2peak) in milliliters per kilogram per minute and converted into metabolic equivalent (MET) values such that one MET corresponded to an oxygen consumption of 3.5 mL/kg/min [based on a 70 kg man aged 40 years] (Fleisher et al, 2007). For this reason, functional status has been classified into three levels, with poor (less than 4 METs), moderate (4-7 METs), and good (> 7 METs) (Cornelissen & Arrowsmith, 2006; Fleisher et al., 2007; Karapandzic, Petrovic, Krivokapic, & Masirevic, 2010). The formula is calculated as follows (Hlatky et al., 1989).

Scoring the Duke Activity Status Index:

VO_2peak = (0.43 x DASI) + 9.6

VO_2peak = _____ ml/kg/min ÷ 3.5 ml/kg/min = _____ METs.

Note. VO2peak = peak oxygen uptake

The VO_2peak is the maximum rate of oxygen consumption as measured during incremental exercise, most typically on a motorized treadmill (Clemente, Withers, & Thompson, 2009; Dlugosz et al., 2013). Maximal oxygen consumption reflects the aerobic physical fitness of the individual, and is an important determinant of their functional capacity during prolonged, sub-maximal exercise. Metabolic equivalent, known as MET, is a physiological concept frequently used to indicate the amount of oxygen or energy the body uses during physical activity. A unit of metabolic equivalent expresses the ratio of an average person's metabolic rate while performing some task compared to their metabolic rate at rest. In practical application, MET is a way of comparing the level of exertion and the energy spent

when people of different weights perform the same physical activity. Metabolic equivalent can also compare the aerobic intensity and energy expenditures of various physical activities when performed by one person. It is conventionally agreed that 1 MET is the equivalent of the energy or oxygen the body uses while at rest. One MET is considered the resting metabolic rate, or the metabolic rate at which the body consumes 3.5 milliliters of oxygen per kilogram of body weight per minute (Ainsworth et al., 2000; Byrne, Hills, Hunter, Weinsier, & Schutz, 2005; Jette, Sidney, & Blumchen, 1990).

The example of the calculation of the DASI sum score used the following formula:

If the participant stated “Yes,” for item 1, 2, 3, 4, 6, 7, and 9, then each item is assigned a weighted score based on the MET value = 2.75, 1.75, 2.75, 5.50, 2.70, 3.50, and 4.50.

The DASI sum score of the participant is = 23 .45

The functional status in MET = ?

$VO_2peak = (0.43 \times DASI) + 9.6$

$= (0.43 \times 23.45) + 9.6$

$VO_2peak =$ 19.68 ml/kg/min ÷ 3.5 ml/kg/min = 5.62 METs.

In conclusion, the functional status can usually be estimated from the ability to perform daily activities, and the DASI was selected to measure functional status in this study with appropriate reasons as follows: 1) The conceptualization and domain of measuring in the DASI are congruent with the operational definition of functional status in this study; 2) The DASI poses relatively no more subjective burden than

others supposed to measure the same concepts; 3) Its validity and reliability have been well-established in population of heart patients; and 4) The DASI is easily taken and inexpensive.

However, the DASI has been a lack of an appropriate translation and validation in Thailand. In an attempt to develop a valid and reliable instrument to measure functional status for Thai patients who had experienced MI, the DASI had to be translated into a Thai version and the psychometric properties tested of this version of the instrument.

Translation process. The original DASI English version was translated into the Thai version with permission by Professor Dr. Mark A. Hlatky, MD. Stanford University School Of Medicine, CA, USA (Appendix C). The translation process was implemented as recommended by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Task Force on the Translation and Cultural Adaptation Process for Patient-Reported Outcome (Spertus et al.) Measures (Wild et al., 2005). The translation process was as follows.

1) Forward translation: Original English version of the DASI was translated into simplified Thai characters for use in Thailand by two PhD candidates majoring in nursing who are native Thai speakers. Two forward translators carry out independent forward translations of the instrument.

2) Review by expert panel: The Thai version of forward translation was reviewed by a bilingual expert panel composed of five members including the original two translators, two cardiologists experienced in instrument development and cardiac rehabilitation, and the researcher. Each individual was asked to examine each item for comprehension or ambiguity of wording. Some wordings on the item

were replaced by the other wordings that were conceptually equivalent and well-known to Thai people, for example, ‘walk a block or 2 on level ground’ was replaced with ‘walk around 3-4 electricity posts (80-160 meters).’

3) Back translation: The instrument was back translated to English by one instructor nurse who had adequate knowledge of and experience with translation from Thai to English. The previous expert panel reviewed the back translated questionnaire in relation to the original questionnaire to ensure linguistic and conceptual equivalence.

4) Pre-testing: The researcher pre-tested the translated version by administering the translated instrument to five persons with MI to administer and identify semantic or comprehension difficulties.

Psychometric properties of the DASI-T. The DASI-T was administered to 100 persons with MI from outpatient department of Maha Sarakham Hospital and Kalasin Hospital in Thailand. Two criterion measures (i.e., Canadian Cardiovascular Society (CCS) Classification and SF-36 physical functioning subscale) were used to test the concurrent validity of the DASI-T. Age groups and CCS classes were used to determine known group validity of the DASI-T. Internal consistency reliability was assessed using Cronbach’s alpha.

The results of the validation of the DASI are summarized as follows. Cronbach’s alpha for the DASI-T total score was .80. No ceiling or floor effect was detected for total score of the DASI-T. Total scores of the DASI-T was correlated significantly ($p < .05$) with the CCS classification ($r = -.58$) and SF-36 physical functioning subscale ($r = .91$). There were statistically significant of the DASI-T total scores to differentiate persons with MI based on age groups ($p < .001$) and CCS

classes ($p < .001$). In conclusion, the DASI-T is potentially reliable and valid instrument to assess functional status in terms of functional capacity in persons with MI.

2. Intervention instruments

The intervention instrument for this study was the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program). The SECR program is a physiopsychosocial nursing intervention designed to improve the functional status of persons with MI during the first month after discharge by addressing self-efficacy enhancement for cardiac rehabilitation and having the collaboration of family members to provide support for each person.

Program development

The researcher developed this program based on social cognitive theory (Bandura, 1986, 1997), which that provides a comprehensive analysis of the determinants of behavior change, in that human behavior is the product of a dynamic interplay of personal, behavioral, and environmental factors. Regarding the personal factors, self-efficacy represents the cognitive aspect, which is the most powerful determinant of behavioral change because it determines the initial decision to perform the behavior, the effort to be expended, and the extent of the persistence in the face of adversity (Bandura, 1997). Accordingly, self-efficacy theory (Bandura, 1986, 1997), the specific activities of self-efficacy enhancement taken from case examples and the literature based on thirty-one interventions from the Nursing Interventions Classification [NIC] documented by Hiltunen et al. (2005), and existing self-efficacy enhancement interventions, were extensively reviewed for developing the self-efficacy enhancement activities of the program, while the social support

concept proposed by House (1981) was reviewed to identify the kinds of family support used in the program. In addition, the existing knowledge about cardiac rehabilitation (Ainsworth et al., 2000; Balady et al., 2007; Goble & Worcester, 1999; The Heart Association of Thailand under the Royal Patronage of H.M. the King, 2010) was extensively reviewed to identify the content of the program.

In the process of program development, the core components of cardiac rehabilitation were first considered for creating the main content of the program. The program then included four core elements: 1) patient assessment, 2) individualized education and counselling; 3) attending the walking exercise and performance of daily activities; and 4) psychosocial management. Second, four major sources of information, enactive mastery experience, vicarious experience, verbal persuasion, and reinterpretation of symptoms (physiological and emotional states), were considered for use in the program as significant strategies to enhance self-efficacy for cardiac rehabilitation in an individual. Lastly, family support was considered in order to maximize the participant's self-efficacy. The family members of the participants were invited to participate in the self-efficacy enhancement activities of the program. The participation of family members in cardiac rehabilitation has been highly recommended since the family members can obtain valuable information about the illness and gain insights into the problems experienced by the patients, such as the psychological basis of the patients' irritability and other symptoms (Balady et al., 2007; Goble & Worcester, 1999). Accordingly, the structure of the program was built (see Table 10), which consisted of three components: 1) motivation-building activities in increasing the practices of cardiac rehabilitation; 2) skill training for cardiac

rehabilitation; and 3) monitoring of the practices of cardiac rehabilitation. The details are as follows.

The motivation-building activities in increasing the practices of cardiac rehabilitation consisted of one session of 40 minutes. The activities included: 1) encouraging the participant to reduce stressors through stress management techniques using deep breathing and self-massage; 2) promoting the sharing of symptom experience; 3) helping to reframe symptoms and explaining how they may be a part of the recovery process; 4) correcting false or unrealistic expectations and interpretations; 5) providing individual health education about MI, walking exercise and performance of daily activities, healthy eating, risk- factor modification, symptom management, and medication taking; 6) exposing the patients to similar others that have successfully recovered; 7) assisting with specific short- and long-term goal setting; 8) identifying strategies on how to achieve goals; and 9) giving verbal support and encouragement, "cheerleading." In this session, the family member was encouraged to engage with the participant in all of the activities and also was encouraged to give the participant positive verbal support during his/her learning about cardiac rehabilitation.

The skill training for cardiac rehabilitation consisted of two sessions at 40 minutes per session. The activities included: 1) encouraging the participant to reduce stressors through stress management techniques; 2) providing skill training about a) activity prescription, b) symptom management, and c) self-recording and evaluation in a diary; and 3) focusing on progress and giving support and encouragement, "cheerleading." Throughout the two sessions, the family member was encouraged to engage with the participant in all of the skill training. He/she was encouraged to give

the participant positive verbal support during his/her skill training, and to discuss about how to provide support and how to validate and provide feedback for the participant regarding cardiac rehabilitation at home.

The monitoring of the practices of cardiac rehabilitation was carried out through using a diary and delivering telephone calls after hospital discharge. The participant had to record their walking exercise and performance of daily activities, while the researcher used three telephone calls (once a week for 3 weeks) with 10-15 minutes per call to each participant and his/her family member. The use of the telephone calls offers interesting prospects for the delivery of the cardiac rehabilitation program beyond the setting of supervised, structured, and group-based rehabilitation, and will help to increase enrolment, reduce risk-factors, and improve the benefit-cost ratio (Mampuya, 2012). Previous studies revealed the positive effect of cardiac rehabilitation in delivering telephone calls once a week for 4 weeks (Song, 2003) and one week (Intarakamhang & Intarakamhang, 2013) after discharge in patients with coronary heart disease (Song, 2003). Thus, delivering telephone calls once a week for 3 weeks was then used in the program along with a recording of the diary for monitoring the progress of the practices for the cardiac rehabilitation of the participants. The telephone calls of the program were focused on: 1) asking the participant to share his/her symptom experiences while at home; 2) helping to reframe symptoms and explaining how they may be a part of the recovery process; 3) correcting false or unrealistic expectations and interpretations; 4) encouraging the participant to reduce stressors through stress management techniques; 5) discussion of the practices of cardiac rehabilitation currently performed; 6) asking about self-recording and evaluation of the diary; 7) giving feedback for achieving short-term

goals; 8) providing guidance to reduce barriers of practices; 9) reviewing expected progress based on short- and long-term goals; and 10) focusing on progress and providing verbal support and encouragement, "cheerleading."

Table 10 Structure of the Self-efficacy Enhancement for Cardiac Rehabilitation Program

Components	Concepts	Contacts	Nursing Intervention Focus
1. Motivation-building activities in increasing the practices of cardiac rehabilitation	Reinterpretation of symptoms (physiological and emotional states)	Session I 2nd day of admission: afternoon:40 min.	● Promote to reduce stressors through stress management techniques using deep breathing & self-massage. ● Promote the sharing of the symptom experiences of participant. ● Help to reframe symptoms and explain how they may be a part of recovery process. ● Correct false or unrealistic expectations and interpretations.
	Verbal persuasion		● Provide individual health education about MI, walking exercise and performance of daily activities, healthy eating, risk-factor modification, symptom management, & medication taking.
	Vicarious experience		● Expose to similar others who have successfully recovered (role model).
	Enactive mastery experience		● Assist with specific short- and long-term goal setting.
	Verbal persuasion		● Identify strategies on how to achieve goals. ● Give verbal support and encouragement, "cheerleading."
	Family support: emotional support.		● Encourage family member to engage with the participant in all of activities. ● Encourage family member to give the participant positive verbal support during learning about cardiac rehabilitation.

Table 10 Structure of the Self-efficacy Enhancement for Cardiac Rehabilitation Program (Continued)

Components	Concepts	Contacts	Nursing Intervention Focus
2. Skill training for cardiac rehabilitation	Reinterpretation of symptoms (physiological and emotional states)	Session II 3rd day of admission: morning: 40 min.	● Promote to reduce stressors through stress management techniques using deep breathing & self-massage.
	Enactive mastery experience.	Session III 3rd day of admission: afternoon: 40 min.	● Train the necessary skills for: - activity prescription (i.e., pulse taking, rate of perceived exertion assessment, warm-up and cool-down exercises, and energy conservation methods). - chest pain management. - self-recording and evaluation in a diary
	Verbal persuasion.		● Focus on progress & Give support and encouragement, “cheerleading.”
	Family support: 1) emotional support;		● Encourage family member to engage with the participant in all of activities. ● Encourage family member to give the participant positive verbal support during skill training.
	2) information support		● Discuss with family member about how to provide support to the participant at home.
	3) appraisal support.		● Train family member about how to validate and provide feedback the practices of the participant at home.

Table 10 Structure of the Self-efficacy Enhancement for Cardiac Rehabilitation Program (Continued)

Components	Concepts	Contacts	Nursing Intervention Focus
3. Monitoring of the practices of cardiac rehabilitation	Reinterpretation of symptoms (physiological and emotional states)	Telephone calls (once a week for 3 weeks)	● Ask the participant to share his/her symptom experiences while at home. ● Help to reframe symptoms and explain how they may be a part of recovery process. ● Correct false or unrealistic expectations and interpretations. ● Remind the participant to reduce stressors through stress management techniques.
	Enactive mastery experience.		● Use diary to monitor the progress of the walking exercise and performance of daily activities ● Discuss about the practices for cardiac rehabilitation currently performed ● Give feedback for achieving short-term goals.
	Verbal persuasion.		● Provide guidance to reduce barriers of practices ● Review expected progress based on short- and long-term goals. ● Focus on progress & Give verbal support and encouragement, “cheerleading.”
	Family support: emotional, information, appraisal, & instrumental support.		● Use the same telephone calls to monitor the progress of family support.

The materials of the SECR program consisted of the following.

1. The program manual for nurses to conduct the SECR program (Appendix E). The program manual was developed for nurses to give information how to implement the program for persons with MI. The information included the conceptual framework of the program and all steps for the SECR program implementation. This program manual also included “The Instruction Plan for Family Member”; “The Skills Training Plan”; “The Guideline to Set Goals of Practices”; “ The Guideline to Approach Role Model”; “The Guideline for Telephone calls”; and “The Evaluation Tools of Activities in the Program.”

2. The booklet (Appendix G). The Booklet named “Manual for Person with MI and Family Member” developed by the researcher was printed with large letters and colorful drawings for persons with MI. It contains information about: (1) disease [i.e., causes of MI and symptoms]; (2) walking exercise (i.e., walking exercise frequency intensity and duration, how to prepare and when to stop walking exercise, warm-up and cool-down, pulse taking, rate of perceived exertion assessment); (3) resumption of the performance of daily activities (i.e., personal care, ambulation, household tasks, sexual activity, social activity, recreation activity, vocational resumption, and energy conservation methods); (4) healthy eating; (5) risk-factor modification including desirable body weight, quitting smoking, and hypertension, diabetes mellitus, and cholesterol control; (6) symptom management (i.e., chest pain management and stress management); and (7) medication taking.

3. The Digital Video Disc (DVD) (Appendix F). The DVD transmitted knowledge about myocardial infarction and presented the role model who has successfully recovered.

4. The diary (Appendix H). The diary was used for self-monitoring and self-evaluation about walking exercise and the performance of daily activities. The checklist in the diary consisted of two parts: 1) the action plan and evaluation of the walking exercise and the performance of daily activities in each week; and 2) everyday walking exercise self-recording.

Program modification

The program manual, booklet, DVD, and diary were validated for content by five experts. Two nurse faculty members that had expertise in self-efficacy theory, one nurse faculty member in the cardiac field, one cardiovascular clinical nurse specialist, and one cardiologist that was an expert in MI and cardiac rehabilitation were asked to validate the structure and content of the program related to the theoretical support. The main suggestions from the five experts indicated that: (1) the content of the program should include more about risk-factor modification; (2) the activities in each hospital visit were too extensive, and the researcher should reconsider and revise them; (3) the session for skill training should be separated into two sessions because the participants needed to take more time to practice them; (4) some of the contents about the disease and the performance of daily activities in the booklet and diary should be corrected based on recommendations; (5) the booklet should be given to the participants in the control group before discharge; and (6) for the validity checking instrument of the program, if the participant could not reach the cut off score for the validity checking instrument, he/she should be excluded from the program and the researcher should also indicate discontinuation criteria. After revising the program based on the comments and suggestions from the five experts, the researcher gave the program materials to two experts in mass media

communication. The main suggestions from the two experts indicated that: (1) the presentation of the DVD was not interesting and exciting, it was more like a PowerPoint than a DVD presentation, and more multimedia should be used that reflect the patient's story telling in a real situation; (2) there was a need to separate the content of the DVD into two parts: part I should be knowledge about MI, and part II should present information about the role model. The researcher revised the DVD based on these suggestions before taking it to the field for testing of the program.

Program trial

The structure of the SECR program was established to serve as an intervention protocol. The field testing of the program was conducted on five persons with MI receiving medical therapy to consider the feasibility and complexity of the intervention. To achieve process fidelity of the intervention, the SECR Program was implemented only by the one researcher that had already been trained in the cardiac rehabilitation course. In addition, the researcher used the program manual for nurses (Appendix E) as a guideline for intervening in order to ensure the same intensity or dosage of the intervention that the participants received. The results of the field testing revealed that there was acceptable delivery of the SECR Program. The researcher found high congruence (100%) between the intervention protocol and the actual implementation, indicating high consistency across implementation. In addition, the SECR Program was feasible for implementation with this patient group.

3. Experimental validity checking instruments

The experimental validity checking instruments included: 1) the Maintain Function subscale of the Cardiac Self-efficacy Scale (CSES), 2) the Family Support Questionnaire.

3.1 The Maintain Function subscale of the Cardiac Self-efficacy Scale (CSES)

The Maintain Function subscale of the CSES is a 5-item questionnaire, which measures a person's perceived confidence to perform exercise and the performance of daily activities. An individual is asked to rate his/her confidence to perform exercise and the performance of daily activities. Each item is rated on a Likert scale, a 5-point scale (*not at all confident, somewhat confident, moderately confident, very confident, and completely confident*). For scoring and interpretation, all questions are summed to produce raw scores (0-20): Higher scores represent better confident (Sullivan et al., 1998).

The Maintain Function subscale of the CSES was developed with high internal consistency and good convergent and discriminant validity. Cronbach's alpha for the maintain function subscale was .87 (Sullivan et al., 1998). The CSES has been translated into a Thai version by Sangsiri (2012) with the reliability .74. In this study, Cronbach's alpha for the Maintain Function subscale of the CSES was .87.

The participants in the experimental group had to meet the confident level in each item of the Maintain Function subscale of the CSES at least very confident. If not, those would be excluded from the program and would receive any further helps from the researcher and other health care providers.

3.2 The Family Support Questionnaire

In this study, the Family Support Questionnaire was divided into two parts: 1) family support for walking exercise; and 2) family support for the performance of daily activities. The family support for walking exercise is a 10-item questionnaire developed by the researcher, which measures a person's perceived family support (i.e., emotional, informational, appraisal, and instrumental support) related to walking exercise. Each item is rated on a Likert scale, a 5-point scale (very good, good, average, not very good; not good at all). These ten items are summed to form a composite score: Higher scores represent better perceived family support for walking exercise. The content validity was validated by three experts (CVI= 1.00). The internal consistency for the ten-item scale was high (Cronbach's alpha = .91).

The family support for the performance of daily activities is a 10-item questionnaire developed by the researcher, which measures a person's perceived family support (i.e., emotional, informational, appraisal, and instrumental support) related to the performance of daily activities. Each item is rated on a Likert scale, a 5-point scale (very good, good, average, not very good; not good at all). These ten items are summed to form a composite score: Higher scores represent better perceived family support for the performance of daily activities. The content validity was validated by three experts (CVI= 1.00). The internal consistency for the ten-item scale was high (Cronbach's alpha = .84).

The participants in the experimental group had to meet the mean score of the perception of family support in each part at least "at good level." If not, those would be excluded from the program and would receive any further helps from the researcher and other health care providers.

Protection of the Rights of Human Subjects

Ethical approval was obtained from Maha Sarakham Hospital Ethics Committee before collecting data. The potential participants who met the eligibility criteria were approached and informed by the researcher in non-technical terms about the purpose, procedure, potential benefits and risks of the study, and right to confidentiality and withdrawal. Once the participants agreed to participate in this study, they signed a consent form (see Appendix D). The participants were assured that their willingness or lack of participation in this study had no implications for the health care services that they would receive. Additionally, all participants were told they were able to withdraw from the study at any time. The decision to discontinue participating in this study did not affect their relationship with health care providers or their access to any services available at the hospital.

Prior to commencing in the program, participants' blood pressure, heart rate, temperature, and symptoms were assessed and recorded. These measures were also recorded following completion of each contact of the program to ensure that they were within normal ranges and that the participants were not suffering from discomfort. In case of any discomfort, the participants would receive care from the researcher along with the standard protocol of acute MI care. To consider the principle of fairness, the control group would be asked for participation in the SECR program after finished the study. In case of agree to participation, they would receive the program similar with the experimental group.

Intervention Procedures

After obtaining permission to conduct the study, the intervention procedures were carried out in three phases, including the preparation, implementation, and evaluation phase. The details are as follows.

1. Preparation phase

1.1 Researcher preparation

The researcher received specific training in the cardiac rehabilitation course before conducting the intervention. The training included 1) enhancing knowledge about MI, exercise and performance of daily activities, healthy eating, risk-factor modification, and medication taking; and 2) practice skills for activity prescription.

1.2 Instrument preparation

All of the instruments and materials of the program were proven for content validity by the experts, and permission was obtained from the Maha Sarakham Hospital Ethics Committee before collecting the data.

1.3 Place preparation

After obtaining permission to conduct the study from Maha Sarakham Hospital, the researcher collaborated with the head nurses and staff nurses of the medical wards and medical out-patient department. The head nurses and staff nurses were informed of the objectives, procedures, and the approximate length of time for data collection. In addition, the researcher requested and prepared a meeting room for the 1st, 2nd, and 3rd sessions of the SECR Program implementation in the medical wards, and for the posttest and evaluation the program in the medical out-patient department.

2. Implementation phase

2.1 Procedures for the control group

The participants in the control group received the usual care offered by nurses in the medical wards, and also were given a booklet before discharge similar to the participants in the experimental group. The content of the booklet was about MI, exercise and performance of daily activities, healthy eating, risk-factor modification, symptom management (i.e., chest pain management and stress management), and medication taking. The usual care was divided into two periods: 1) care during hospitalization, and 2) care during the 4 weeks after hospital discharge.

2.1.1 Care during hospitalization

On the second day of admission, the participants in the control group were approached and encouraged to continue the cardiac rehabilitation during hospitalization. That is, they received medical evaluation and nursing care, and were trained step-by-step in the structured exercise and performance of daily activities during hospitalization. During the discharge day, they were given individual education about MI, healthy eating, risk-factor modification, and medication taking. All participants were informed of and scheduled for their follow-up care at the hospital.

2.1.2 Care during the 4 weeks after hospital discharge

After the participants were discharged from the hospital, they were assigned for the routine follow-up care offered in the medical out-patient department during the 2nd and 4th week after discharge. They were given group health education while waiting to see the physician, and were also given individual

health education after seeing the physician. The education was focused on MI, healthy eating, risk-factor modification, and medication taking.

2.2 Procedures in the experimental group

The participants in the experimental group participated in the SECR Program and received the usual care, which was composed of three components and covered the four sessions of implementation within the 4 weeks after admission, as shown in the program manual (Appendix E). The activities of this program were implemented in four sessions which can be concluded as follows.

Session 1

Place: the meeting room in the medical wards

Time: in the afternoon, on the 2nd day of admission, 40 minutes

Activities:

During the initial meeting, the researcher began with developing a relationship and building trust with the participant and his/her family member through the sharing of self-experiences. The researcher gave an explanation about the program, the participant's and family member's responsibility, and what the researcher would do. After that, the researcher provided an instruction course about the family member's role for the participant and family member that was a significant caregiver (instruction plan can be found in Appendix E).

For the program beginning, the researcher encouraged the participant to reduce his or her stressors through stress management techniques using deep breathing and self-massage (instruction plan can be found in Appendix E). After that, the participant was encouraged to describe his/her story about symptom experience during the cardiac event, and then the researcher helped to reframe the symptoms and also explained how they may be a part of the recovery process. If the participant had false or unrealistic expectations, the researcher helped to correct them (example cases can be found in Appendix E). Then, the participant was given individual health education about MI, walking exercise, performance of daily activities, healthy eating, risk-factor modification, symptom management (i.e., chest pain management and stress management), and medication taking by watching the Digital Video Disc (DVD) (Appendix F) and receiving a booklet (Appendix G). The booklet reinforced the content of the DVD. A discussion and evaluation of knowledge took place after completing the individual health education.

After that, the participant was exposed to similar others that had successfully recovered (role model) through watching the DVD (Appendix F). Then, the participant with MI engaged in a discussion about the role model by using the script provided (see guideline for discussion in Appendix E). The main topics of the discussion focused on 1) the role model's success and strength of ability, and 2) the feasibility of the participant in terms of practicing cardiac rehabilitation at home.

For the goal setting activity, the researcher assisted the participant to develop his/her short- and long-term goals by using the script provided (see guideline in Appendix E) and then helped him/her develop individualized strategies for how to achieve his/her goals by using "The Action Plan" in the diary (see

Appendix H). Throughout this session, the researcher provided verbal support and encouragement, “cheerleading.”

Family member**.** To increase the family member’s support, the researcher gave the family member an opportunity to actively participate with the participant in all of the activities of session 1. Throughout the learning in session 1, the family member was encouraged to provide positive verbal support to the participant.

Activity evaluation:

In this session, the participants and their family members completely participated in all of the activities. They learned to appreciate the practice of deep breathing and self-massage. Each participant shared his/her story about symptom experience during the cardiac event, and the family member participated and helped him/her recall that event. In this activity, it was found that most of the participants experienced the classical symptom of acute MI (i.e., chest pain). The additional symptoms mostly were sweating, heartburn and/or indigestion, and shortness of breath. More interesting, most participants had false or unrealistic expectations about living with MI. Then, the researcher helped to correct those expectations and interpretations; all of the participants accepted and expressed their thought with more understanding about their expectations. After the participants were given individual health education, the researcher discussed and asked about their knowledge. About 70% of the participants could answer and get a score that passed the criterion of the questionnaire (80% of the full score). In the case that they could not meet this criterion, the researcher explained more about the issue that the participant could not answer and led him/her to answer again. In the end, all of the

participants could meet the criterion of the questionnaire. Regarding exposure to role model activity, it was found that most participants and their family members were interested in watching the role model. They appreciated the performance of the role model, and said that they could do what the role model did. However, five participants said that they were not sure but that they would try. For the goal-setting activity, the participants could develop their own short- and long-term goals by having assistance from the researcher and their family members.

Session 2

Place: the meeting room in the medical wards

Time: in the morning, on the 3rd day of admission, 40 minutes

Activities:

Stress management techniques for the participant by deep breathing and self-massage were promoted at the program beginning. After that, the participant learned about activity prescription, including how to take his/her pulse, how to assess his/her rate of perceived exertion, what warm-up and cool-down exercises to perform, and how to conserve energy. He/she also practiced the skills step-by-step, guided by "The Skill Training Plan" (see Appendix E). Throughout this skill training, the researcher provided verbal support and encouragement, "cheerleading."

Family member. To increase the family member's support, the family member was invited to engage with the participant in skills training. He/she engaged in a discussion about how to provide support to the participant and how to validate and give feedback on the participant's practices at home. Throughout the participant's skill training, the family member was encouraged to provide positive

verbal support. In this session, the researcher evaluated the participant's skills by using "The Skills Practice Checklist" (see evaluation tools in Appendix E).

Activity evaluation:

In this session, the participants and their family members could practice deep breathing and self-massage better. They enjoyed practicing the warm-up and cool-down exercises and energy conservation methods. During the practices, the family members could do well in providing positive verbal support for the participants. Regarding the pulse taking training, it was found that most participants and family members said that they had never taken it before and did not know what the benefit was. At the beginning of the practice, most participants and their family members looked worried about doing it; however, when they got their pulse and could count it, they expressed their feeling and speech with excitement. More important, the skill practices of the participants were assessed by "The Skills Practice Checklist", and they were able to achieve a score that passed the criterion of the checklist (80% of the full score).

Session 3

Place: the meeting room in the medical wards

Time: in the afternoon, on the 3rd day of admission, 40 minutes

Activities:

Stress management techniques for the participant using deep breathing and self-massage were promoted again at the program beginning. After that, the participant reviewed the practice of skills in session 2, and then practiced the skills of chest pain management and learned how to use the diary for monitoring the walking exercise and performance of daily activities at home. "The Skill Training

Plan" (see Appendix E) was used as a guide for the skill training step-by-step. Throughout the skill training, the researcher provided verbal support and encouragement, "cheerleading."

Family members. In order to increase the family member's support, the family member was invited to engage with the participant in skill training. He/she was engaged in a discussion about how to provide support to the participant and how to validate and provide feedback on the participant's practices at home. Throughout the participant's skill training, the family member was encouraged to provide positive verbal support. In this session, the researcher evaluated the participant's skills by using "The Skills Practice Checklist" (see evaluation tools in Appendix E).

Activity evaluation:

In this session, the participants and their family members could practice deep breathing and self-massage well. They were able to review the practice of skills during session 2 with more confidence. The participants interested in practicing chest pain management had the family member observe beside them, providing verbal support. They realized that this management would help them survive when they had chest pain. The participants and their family member intended to learn how to keep a record in the diary; they shared their opinions and planned to do it together. Regarding the evaluation of their practices, they received a score that passed the criterion of the checklist (80% of the full score).

Session 4

Place: at participant's home

Time: 1-4 weeks after discharge

Activities:

During the first month after discharge, the participant was asked to engage in the regular walking exercise and performance of daily activities at home, and was also asked to record his/her walking exercise and performance of daily activities in the diary, while the researcher delivered three telephone calls (the 1st, 2nd, 3rd week after discharge) to the participant, 10 to 15 minutes per call, to monitor the progress of the practices of cardiac rehabilitation at home.

The diary was developed by researcher based on the contents of the walking exercise and performance of daily activities in the SECR Program. The participants in the experimental group had to record and evaluate their walking exercise and performance of daily activities related to their goals with family member. The participant was encouraged to show his/her recording in the diary about his/her walking exercise and performance of daily activities. At this point, the participants had to perform the walking exercise at least 3 days a week and also was to perform the walking exercise and performance of daily activities correctly—more than 75% of the indicated instruction—during the last week (the 4th week after discharge).

The telephone calls of the program were focused on: 1) asking the participant to share his/her symptom experiences while at home; 2) helping to reframe symptoms and explanation of how they may be a part of the recovery process; 3) correcting false or unrealistic expectations and interpretations; 4)

encouraging the participant to reduce stressors through stress management techniques; 5) discussing the practices of cardiac rehabilitation currently performed; 6) asking about self-recording and evaluation in the diary; 7) giving feedback for achieving short-term goals; 8) providing guidance to reduce barriers to the practices; 9) reviewing expected progress based on short- and long-term goals; and 10) focusing on their progress and providing verbal support and encouragement, "cheerleading."

Family members. The researcher delivered telephone calls on the same day as the participant for 10-15 minutes to remind and monitor the progress of the family support. The telephone calls were focused on: 1) asking about the participant's practices of cardiac rehabilitation; 2) asking about their recording in the diary; 3) asking about the participant's problems and barriers in the practice of cardiac rehabilitation; 4) providing guidance to overcome the participant's problems and barriers to practices; 5) reviewing expected family support; and 6) focusing on the progress of family support and providing verbal support and encouragement, "cheerleading."

Activity evaluation:

While using telephone calls and the diary for monitoring the progress of the practices of the cardiac rehabilitation of the participant, one participant often experienced chest pain and had to be referred to another tertiary care for advanced treatment, while another could not continue the walking exercise because he was too busy. Therefore, 31 participants engaged in the regular walking exercise and performed their daily activities appropriately related to recording in the diary. Each participant achieved his/her short-term goals. They could perform the walking exercise 5-7 days a week and also could perform the walking exercise and

performance of daily activities correctly at 75-100% of the indicated instruction during the last week (the 4th week after discharge). More interesting, it was found that two participants had problems about the perceived negative consequences of their illness that affected their practice of cardiac rehabilitation. This evidence is consistent with a previous Thai study by Sriprasong (2008) that found that during the first month after discharge, the persons with MI strongly believed that their illness had negative consequences to their lives. Negative illness perception is believed to have a relation with fatigue, emotional distress, and functional status (Alsen, Brink, Persson, Brandstrom, & Karlson, 2010). Greater patients' perceived consequences of a heart condition, the lower was the general self-efficacy available to cope with the condition (Lau-Walker, 2004). In these cases, the researcher helped them to correct this perception by addressing their symptom experience, providing information on the recovery process, reminding them of their goals, encouraging them to reduce their stressors through the stress management techniques that they preferred, and encouraging them to continue their practices as well as they could. The researcher also shared information with family members about the practices and problems of the participants so that they could solve the problems together. In the end, two participants were able to continue participation in the program and adapt themselves to their disease.

3. Evaluation phase

This phase was carried out at 4 weeks after discharge and aimed to: 1) evaluate the long-term goal of the participant in the experimental group; 2) obtain data about the perceived self-efficacy for cardiac rehabilitation and perceived family support of the participant in the experimental group by the researcher; and 3) obtain

data about the participants' functional status for post-testing both groups by the researcher.

The participants in the control group were asked to come to the medical out-patient department on the follow-up day (4 weeks after discharge) for evaluation of their functional status. Thirty participants came for the appointment, whereas three participants could not. Two participants were readmitted and one participant was referred to another tertiary care site for advanced treatment.

For the experimental group, two participants discontinued participation; that is, one participant was referred to another tertiary care site for advanced treatment and another could not continue her walking exercise because he was too busy. Therefore, 31 participants participated in the evaluation. Each participant was encouraged to evaluate the achievement of his/her long-term goal. The participant was encouraged to share his/her practices of cardiac rehabilitation. In addition, the participant was asked to complete the Maintain Function subscale of the CSES and Family support Questionnaire. They had to meet the confidence level for each item of the Maintain Function subscale of the CSES at least "very confident," and had to meet the mean score of the perception of family support for each part of the Family Support Questionnaire at least "a good level"

In this study, all of the participants in the experimental group achieved their long-term goal. Their confidence levels for each item of the Maintain Function subscale of the CSES were at "very confident" and "completely confident." Their perceptions of family support for each part of the Family Support Questionnaire were at a "good" and "very good" level.

Data Collection

The data collection period was during June-November 2013. This study began with recruitment of participants and ended with a hospital visit the follow-up day (the 4th week after discharge). Data was collected to measure demographic and clinical characteristics of the participants by the questionnaire and medical records review. The functional status was assessed for pretest by the Thai version of the Duke Activity Status Index (DASI-T) on the 2nd day of admission at medical wards. At the 4th week after discharge, the participant in the experimental and control groups were assessed functional status for posttest using the DASI-T.

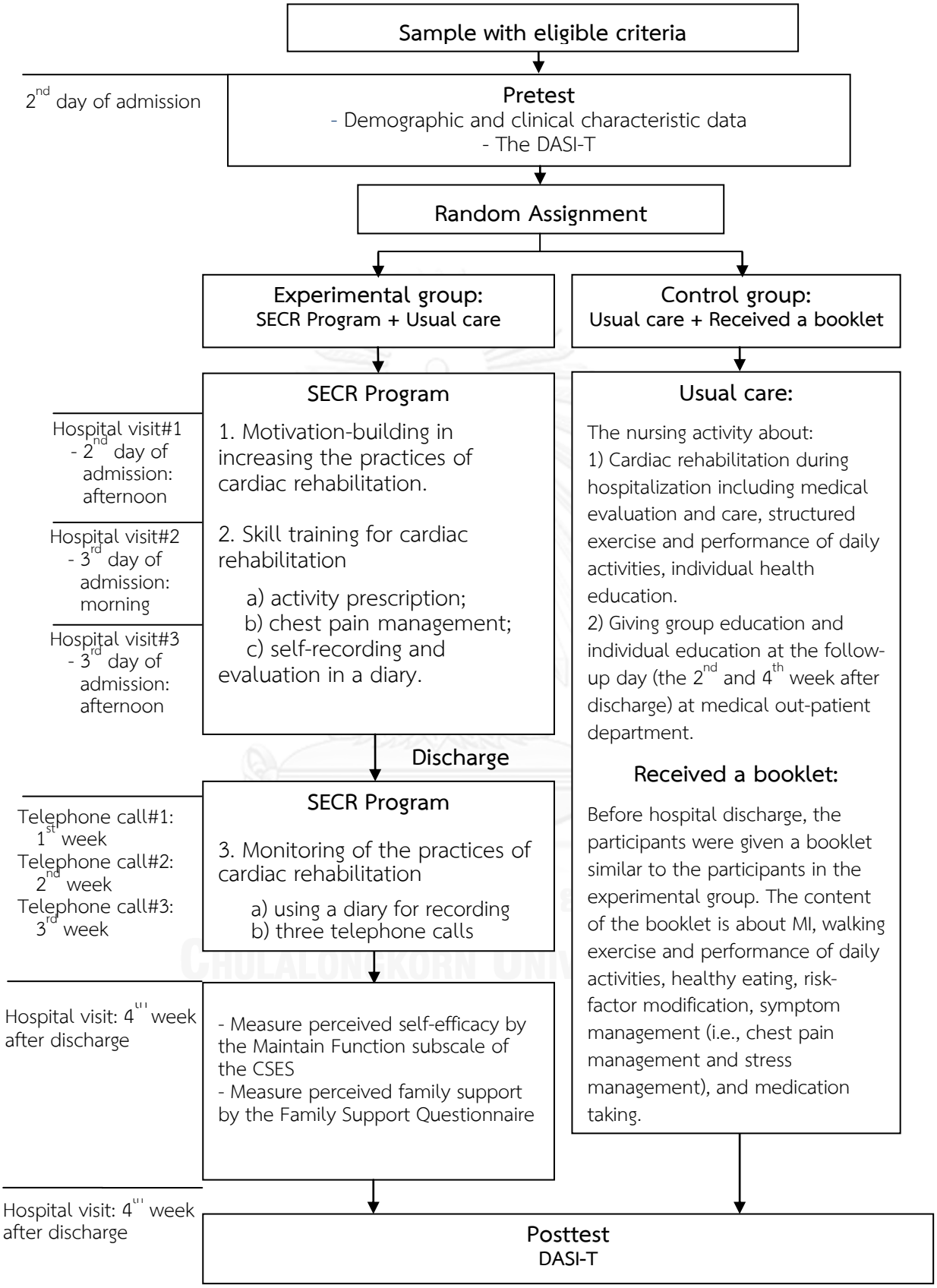

Figure 7 Research study procedures

Data Management and Analyses

Data management

The researcher checked the data collection instruments at each measurement time point for completeness and accuracy. Data was coded and simultaneously entered into a data base. Data was entered by personal that was blind to the subjects' condition assignment. The data was double-checked for entry errors; errors were checked directly against the original data file and corrected.

Data analyses

For data analysis purposes, the data was imported into the statistical software SPSS Statistic, version 16.0, for Windows. Initially, data cleaning strategies were performed to determine whether information was beyond the range of what was expected or was logically inconsistent. Frequency was checked to determine whether the error was a coding error or an entry error. Mean and standard deviation were identified by errors in interval level data. Missing data was examined. All randomized participants were analyzed based on their group assignment. Data analyses were dependent on the level of measurement of variables and the research question. All statistical tests were performed at 5% level of significance.

Descriptive statistics were used to analyze the demographic and clinical data of the samples by using frequency, percentage, means, and standard deviation. Chi-square was used to examine the differences between the experimental and control groups regarding the categorical variables. An independent *t*-test was used to analyze the difference in the means of the variables between both groups.

The independent *t*-test is described as a robust parametric test with respect to the assumption of normality, homogeneity of variance, and independence. The *t*-test is relatively insensitive (having little effect) to the violations of normality and homogeneity of variance, depending on the sample size and the type and magnitude of the violation. If $n1 = n2$ and the size of each sample is equal to or greater than 30, a *t* test for independent groups may be used without appreciable error despite moderate violations of the normality and/or the homogeneity of variance assumptions (Pagano, 2004). Sample sizes can be considered equal if the larger group is not more than 1½ times larger than the smaller group (Morgan, Leech, Gloeckner, & Barrett, 2004). In addition, it has long been established that moderate violations of the parametric test have little or no effect on substantive conclusions in most instances (Cohen, 1969, p. 266-267). In this study, the functional status score was the non-normal distribution within each of the two groups (see Appendix I). However, the sample size of the experimental group was greater than 30, while the sample size of the control group was equal to 30, and the sample size of each group was considered equal. In addition, the variances of the dependent variable in the two groups were equal. Therefore, the moderate violation of the normality assumptions was taken in this study. The independent *t*-test was then performed to determine the differences in the functional status scores between the experimental and control group, and the paired *t*-test was performed to compare the differences in functional status scores between the pretest and posttest in each group. The significance level of all statistical tests was set at .05 (one-tailed).

CHAPTER IV
RESEARCH RESULTS

The purpose of this study was to determine the effect of the Self-efficacy Enhancement for Cardiac Rehabilitation (SECR Program) on functional status in persons with MI. A detailed description of the research results is presented in this chapter. The chapter is structured in three parts. The first part contains information about the characteristics of the sample. The second part includes a description of the dependent variable and the results from hypothesis testing. Finally, the third part of the chapter presents with a description of additional findings of interest generated in the course of the study.

Characteristics of the Sample

Demographic characteristics of the sample

The age of the participants ranged from 40 to 81 years with a mean age of 64.03 year (*SD* = 9.55), while 37.70% was in the age group of 61-70 years. About 59.02% of the participants were male. Most participants were married (83.61%) and were completed a primary school education (91.80%). About 54.10% of the participants were unemployed and retired. Most participants had income lower than 5,000 Baths/month (86.89%) and about 77.05% perceived their incomes were enough. About 75.41% of the participants paid for health care service by universal coverage (30 Bath Schema). More than half of the participants (57.38%) had spouse for taking care of them during the first month after hospital discharge. A similar pattern of the findings was found among the participants in the experimental and

control groups except for the age group. About 38.71% of the participants in the experimental group were in the age group of 71-80 years, while 40% of the participants in the control group were in the age group of 61-70 years. However, the chi-square test revealed that the characteristics between the experimental and control groups were not significantly different. The demographic characteristics of the sample are shown in Table 11

Table 11 Demographic characteristics of the sample

Demographic characteristics	Experimental group (*n* = 31) *n* (%)	Control group (*n* = 30) *n* (%)	Total (*N* = 61) *N* (%)	χ^2	*p*-value
Age group (year)				5.62	.23
41-50	4 (12.90)	2 (6.67)	6 (9.84)		
51-60	4 (12.90)	9 (30.00)	13 (21.31)		
61-70	11 (35.48)	12 (40.00)	23 (37.70)		
71-80	12 (38.71)	6 (20.00)	18 (29.51)		
>80	-	1 (3.33)	1 (1.64)		
Average age (year)	*M* = 64.68	*M* = 63.37	*M* = 64.03		
	SD = 9.32	*SD* = 9.90	*SD* = 9.55		
Range of age (year)	44-79	40-81	40-81		
Gender				1.99	.16
Male	21 (67.74)	15 (50.00)	36 (59.02)		
Female	10 (32.26)	15 (50.00)	25 (40.98)		
Marital status				4.76	.19
Single	-	2 (6.67)	2 (3.28)		
Married	28 (90.32)	23 (76.67)	51 (83.61)		
Widowed	2 (6.45)	5 (16.67)	7 (11.48)		
Divorced /Separated	1 (3.23)	-	1 (1.64)		
Education achievement				2.06	.36
Primary school	27 (87.10)	29 (96.67)	56 (91.80)		
Secondary school	1 (3.23)	-	1 (1.64)		
≥ Graduate	3 (9.68)	1 (3.33)	4 (6.56)		

Table 11 Demographic characteristics of the sample (continued)

Demographic characteristics	Experimental group (*n* = 31) *n* (%)	Control group (*n* = 30) *n* (%)	Total (*N* = 61) *N* (%)	χ^2	*p*-value
Occupation				5.92	.31
Unemployed	12 (38.71)	19 (63.33)	31 (50.82)		
Retired	2 (6.45)	-	2 (3.28)		
Laborer	4 (12.90)	1 (3.33)	5 (8.20)		
Farmer	10 (32.26)	8 (26.67)	18 (29.51)		
Merchant	2 (6.45)	1 (3.33)	3 (4.92)		
Government officer	1 (3.23)	1 (3.33)	2 (3.28)		
Income (Baht per month)				2.82	.42
< 5,000	25 (80.65)	28 (93.33)	53 (86.89)		
5,000-10,000	2 (6.45)	1 (3.33)	3 (4.92)		
10,001-15,000	2 (6.45)	-	2 (3.28)		
>15,000	2 (6.45)	1 (3.33)	3 (4.92)		
Patient-perceived level of income				0.01	. 94
Just enough	24 (77.42)	23 (76.67)	47 (77.05)		
Not enough	7 (22.58)	7 (23.33)	14 (22.95)		
Financial supports for health care service				1.36	.51
Government support	8 (25.81)	6 (20.00)	14 (22.95)		
Universal coverage (30 Bath Schema)	22 (70.97)	24 (80.00)	46 (75.41)		
Social security insurance	1 (3.23)	-	1 (1.64)		
Family member's role				4.77	.09
Spouse	22 (70.97)	13 (43.33)	35 (57.38)		
Sibling	6 (19.35)	11 (36.67)	17 (27.87)		
Offspring	3 (9.68)	6 (20.00)	9 (14.75)		

Clinical characteristics of the sample

About 68.85% of the participants had disease risk-factors, while 32.79% had a combination of three disease risk-factors (i.e., hypertension, diabetes mellitus, and dyslipidemia). About 22.95% of the participants were current smokers. Most participants did not exercise (77.05%). Only 11.48% of the participants regularly ate high saturated fat and cholesterol food. A similar pattern of findings was found among the participants in the experimental and control groups. The chi-square test revealed that the characteristics between the experimental and control groups were not significantly different. The demographic characteristics of the sample are shown in Table 12.

Table 12 Clinical characteristics of the sample

Clinical characteristics	Experimental group (*n* = 31) *n* (%)	Control group (*n* = 30) *n* (%)	Total (*N* = 61) *N* (%)	χ^2	*p*-value
Disease risk-factor				7.34	.40
HT	1 (3.23)	3 (10.00)	4 (6.56)		
DM	1 (3.23)	-	1 (1.64)		
Dyslipidemia	1 (3.23)	3 (10.00)	4 (6.56)		
HT & DM	2 (6.45)	4 (13.33)	6 (9.84)		
HT & Dyslipidemia	2 (6.45)	3 (10.00)	5 (8.20)		
DM & Dyslipidemia	-	2 (6.67)	2 (3.28)		
HT & DM & Dyslipidemia	12 (38.71)	8 (26.67)	20 (32.79)		
None	12 (38.71)	7 (23.33)	19 (31.15)		
Smoking history				2.94	.23
Non smoking	12 (38.71)	18 (60.00)	30 (49.18)		
Ex-smoker	11 (35.48)	6 (20.00)	17 (27.87)		
Current smoking	8 (25.81)	6 (20.00)	14 (22.95)		
Exercise				3.12	.21
None	21 (67.74)	26 (86.67)	47 (77.05)		
Occasionally	8 (25.81)	3 (10.00)	11 (18.03)		
Regularly	2 (6.45)	1 (3.33)	3 (4.92)		
Eating high saturated fat and cholesterol food				3.81	.28
None to fairly	23 (74.19)	23 (76.67)	46 (75.41)		
Occasionally	5 (16.13)	3 (10.00)	8 (13.11)		
Regularly	3 (9.68)	4 (13.33)	7 (11.48)		

Note. HT = Hypertension; DM = Diabetes mellitus.

Clinical characteristics related to hospitalization of the sample

Most participants were diagnosed with non ST elevated myocardial infarction (81.97%). About 73.77% of the participants had a body mass index at normal level (less than 25 kg/m^2). About 67.21% of the participants had a systolic blood pressure at normal level (<130 mmHg) and about 67.21% had a diastolic blood pressure at normal level (<80 mmHg). More than half (54.10%) of the participants had a fasting blood sugar at normal level (90-130 mg/dl). About 72.13% of the participants had cholesterol at normal level (<200 mg/dl) and about 54.10% of the participants had a low-density lipoprotein at high level (≥100 mg/dl). The length of stay of the participants ranged from 3 to 6 days with a mean of 4.69 days (*SD* = 1.04). A similar pattern of findings was found among the samples in the experimental and control groups. The chi-square test and *t* test revealed that the characteristics between the experimental and control groups were not significantly different. The demographic characteristics of the sample are shown in Table 13.

Table 13 Clinical characteristics related to hospitalization of the sample

Clinical characteristics	Experimental group (*n* = 31) *n* (%) or *M±SD*	Control group (*n* = 30) *n* (%) or *M±SD*	Total (*N* = 61) *N* (%) or *M±SD*	χ^2/t	*p*-value
Diagnosis				0.16	.69
NSTEMI	26 (83.87)	24 (80.00)	50 (81.97)		
STEMI	5 (16.13)	6 (20.00)	11 (18.03)		
BMI (kg/m^2)				0.43	.51
≤ 25	24 (77.42)	21 (70.00)	45 (73.77)		
> 25	7 (22.58)	9 (30.00)	16 (26.23)		
SBP (mmHg)				0.01	.81
< 130	21 (67.74)	20 (66.67)	41 (67.21)		
≥ 130	10 (32.26)	10 (33.33)	20 (32.79)		
DBP (mmHg)				0.21	
< 80	20 (64.52)	21 (70)	41 (67.21)		
≥ 80	11 (35.48)	9 (30)	20 (32.79)		
FBS (mg/dl)				1.33	.59
< 90	7 (22.58)	9 (30)	16 (26.23)		
90-130	19 (61.29)	14 (46.67)	33 (54.10)		
>130	5 (16.13)	7 (23.33)	12 (19.67)		
Cholesterol (mg/dl)				0.60	.36
< 200	21 (67.74)	23 (76.67)	44 (72.13)		
≥ 200	10 (32.26)	7 (23.33)	17 (27.87)		
LDL (mg/dl)				2.76	.39
< 100	11 (35.48)	17 (56.67)	28 (45.90)		
≥ 100	20 (64.52)	13 (43.33)	33 (54.10)		
LOS (day)	4.90±0.94	4.47±1.11	4.69±1.04	1.66^t	.10
Range	3-6	3-6	3-6		

Note. SBP = Systolic blood pressure; DBP = Diastolic blood pressure; FBS = Fasting blood sugar; LDL = Low-density lipoprotein; LOS = Length of stay

t = *t*-test

Description of the Functional Status

Functional status score was reported on a scale of the Thai version of the Duke Activity Status Index (DASI-T). To indicate the level of functional status in this study, the DASI-T sum score was calculated to the metabolic equivalents (METs) score using the formula as mention previously in Chapter 3. The potential range of the METs score was 0-9.89. The series of cut-off point in METs to determine functional status level in this study are as follows: less than 4 METs *(poor)*, 4 to 7 METs (*moderate*), and > 7 METs (*good*) (Cornelissen & Arrowsmith, 2006; Fleisher et al., 2007; Karapandzic et al., 2010).

The scores of the functional status in the experimental and control groups at each point of measurement are presented in Table 14. From this table, at pretest, both groups had similar functional status scores at a poor level (*M* = 3.25 METs, *SD* = 0.09, range = 3.08 to 3.30 METs). At posttest, in the experimental group, the functional status score increased from a poor level to a moderate level (*M* = 6.26 METs, *SD* = 0.66, range = 5.62-7.99 METs). While the functional status score of the control group also increased from a poor level to a moderate level (*M* = 4.40 METs, *SD* = 0.61, range = 3.63-5.62 METs).

Table 14 Functional status scores of the experimental and control groups

Group	Functional status (METs)					
	Pretest			Posttest		
	M±SD	Range	Level	*M±SD*	Range	Level
Experimental	3.25±0.09	3.08-3.30	Poor	6.26±0.66	5.62-7.99	Moderate
Control	3.25±0.09	3.08-3.30	Poor	4.40±0.61	3.63-5.62	Moderate

Note. METs = metabolic equivalents

Results of Hypothesis Testing

Hypothesis 1: Participants in the experimental group will have better functional status than participants in the control group.

To answer the hypothesis, functional status score was reported on a scale of the Thai version of the Duke Activity Status Index (DASI-T). The potential range of the METs score was 0-9.89, where higher score indicated better functional status. The independent *t* test was performed to test the differences of the DASI-T scores between both groups (group: experimental vs. control) at pretest and posttest. The significance level was set at .05 (one-tailed).

Table 15 shows the independent *t* test results. At pretest, both groups had similar DASI-T mean scores of 3.25 (*SD* = 0.09). The independent *t* test revealed that there was no statistical difference between the experimental and control groups (*t* = -0.24, *p* = .81). That was, both groups had similar functional status at baseline. At posttest, in the experimental group, the DASI-T mean score was 6.26 (*SD* = 0.66). In the control group, the DASI-T mean score was 4.40 (*SD* = 0.61). The independent *t* test revealed that the DASI-T mean scores were significantly higher in the experimental group than in the control group (*t* = 11.33, *p* < .001). That meant the participants in the experimental group had better functional status than those in the control group (*p* <. 001).

Table 15 Comparisons of mean scores for the DASI-T between the experimental and control groups at pretest and posttest

Functional status (METs)	Experimental group (*n* = 31)		Control group (*n* = 30)		*t*	df	*p*-value
	Mean	*SD*	Mean	*SD*			
Pretest	3.25	0.09	3.25	0.09	-0.24	59	.81
Posttest	6.26	0.66	4.40	0.61	11.33	59	< .001

Hypothesis 2: After participating in the SECR Program, the participants in the experimental group will have better functional status than before participating in the program.

To answer the hypothesis, functional status was reported on a scale of the Thai version of the Duke Activity Status Index (DASI-T). The potential range of the METs score was 0-9.89, where higher score indicated better functional status. The paired *t*-test was performed to test the difference of the DASI-T scores between pretest and posttest in each group. The significance level was set at .05 (one-tailed).

Table 16 shows the paired *t*-test results. In the experimental group, the DASI-T mean score at posttest (*M* = 6.26, *SD* =0.66) was higher than the DASI-T mean score at pretest (*M* = 3.25, *SD* =0.09). The DASI-T mean score difference was 3.01 METs. The paired *t*-test revealed that the DASI-T mean score at posttest was significantly higher than the DASI-T mean score at pretest ($t = 25.55$, $p < .001$). That is, after participating in the SECR Program, the participants in the experimental group had better functional status than before participating in the program ($p < .001$).

In the control group, the DASI-T mean score at posttest (*M* = 4.40, *SD* = 0.61) was higher than the DASI-T mean score at pretest (*M* = 3.25, *SD* = 0.09). The DASI-T mean score difference was 1.15 METs. The paired *t*-test revealed that the DASI-T

mean score at posttest was significantly higher than the DASI-T mean score at pretest (t = 10.89, p = < .001). That is, after receiving the usual care and a booklet, the participants in the control group had better functional status than before receiving the usual care and a booklet (p < .001).

Table 16 Comparisons of mean scores for the DASI-T between pretest and posttest in the experimental and control groups

Functional status (METs)	Pretest		Posttest		Mean difference	*t*	df	*p*-value
	Mean	*SD*	Mean	*SD*				
Experimental group(*n* = 31)	3.25	0.09	6.26	0.66	3.01	25.55	30	<.001
Control group(*n* = 30)	3.25	0.09	4.40	0.61	1.15	10.89	29	<.001

Additional Findings

In this study, additional information was found during program evaluation after posttest of the study. The participants in the experimental group addressed about program usefulness, overall quality of the program, and recommendations or suggestions about the program. Responses, frequencies, and a summary of these findings are provided as follows.

Usefulness of the SECR Program

All Persons with MI and their family members (100%) rated the program to be very or quite useful as shown in Table 17. An example of the program's usefulness provided by Persons with MI and family member: "I think this program is VERY useful! Goal setting inspires me to practice of cardiac habitation and challenge me to achieve my goals." "I feel so confident to practice in walking exercise and ADL performance without fear. I think walking exercise every day help me to get better and fitness." "The role model is so impressive, he provide me with the real feeling and experiences of illness, walking exercise, and the performance of daily activities. I think I can practice well like him." "This is a very good and useful program which is possible and safety to practice. The training is not difficulty for initial practice, the training can enhance my confidence in applying to practice." One family caregiver stated that "I gain more knowledge and understanding about my husband's illness. I feel good to be a part of the program and help him get better health, this is a useful program." The other one stated that "This program is good that let family member to be a part of patient's successful practices and I know how to take care of the patient to get health."

Quality of the SECR Program

All Persons with MI and their family members (100%) rated the program very good and good as shown in Table 17.

Table 17 Evaluation of the program in the experimental group

Response	Persons with MI (*n* = 31)		Family member (*n* = 31)	
	Frequency	Percent	Frequency	Percent
Usefulness of the program				
Very useful	28	90.32	27	87.10
Quite useful	3	9.68	4	12.90
Quality of the program				
Very good	28	90.32	26	83.87
Good	3	9.68	5	16.13

Suggestions or recommendations about the program

Suggestions and recommendations of participants were focused on providing continuous follow-up through telephone calls and home visits. It would be very useful and pleasant.

CHAPTER V
DISCUSSION IMPLICATION AND RECOMMENDATION

In this chapter, the findings are summarized and discussed. Then, the implications for nursing and recommendations for future research are addressed.

Summary of the Study

The purpose of this study was to determine the effect of the Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program) on functional status in persons with MI. This study used the two-group randomized controlled trial with pretest/posttest design. The participants in this study were 66 persons with MI and received medical therapy at medical wards, Maha Sarakham Hospital, Maha Sarakham Province, in the northeastern region of Thailand. Each participant was randomly assigned to either the experimental or control group by using blocks of four randomization. Thirty-three participants were in the experimental group and the other 33 were in the control group. During follow-up, in the experimental group one participant was referred to another tertiary care site for advance treatment and one participant could not continue walking exercise because of too busy, while in control group two participants were readmission and one participant was referred to another tertiary care site for advance treatment. Therefore, 31 participants were in the experimental group and 30 participants were in the control group.

The participants in the experimental group participated in the SECR Program. The SECR Program was a physiopsychosocial nursing intervention designed to improve functional status during the first month after discharge in persons with MI

who received medical therapy through enhancing self-efficacy for cardiac rehabilitation constructed from four major sources of information (i.e., enactive mastery experience, vicarious experience, verbal persuasion, and reinterpretation of symptoms) and having a collaboration of family member for provide support (i.e., emotional, appraisal, informational, and instrumental).The core content of the program addressed the cardiac rehabilitation during the first month after discharge. The SECR Program consisted of three components: 1) motivation-building activities in increasing the practices of cardiac rehabilitation; 2) skill training about activity prescription, chest pain management, and self-recording and evaluation in a diary; and 3) monitoring of the practices of cardiac rehabilitation. These three components of the SECR Program covered four sessions (three hospital visits and three telephone calls) during 4 weeks after admission.

The participants in the control group received the usual care and a booklet before discharge which was focused on cardiac rehabilitation during the first month after discharge. The contents of the booklet include knowledge about MI, walking exercise and resumption of the performance of daily activities, healthy eating, risk-factor modification, symptom management (i.e., chest pain management and stress management), and medication taking.

The results of this study were demonstrated by an evaluation of functional status measured by the DASI-T at 4 weeks after discharge. After participating in the program, the participants in the experimental group had better functional status than those in the control group ($p < .001$). In addition, functional status in the experimental group significantly improved ($p < .001$).

Discussion

The effect of Self-efficacy Enhancement for Cardiac Rehabilitation Program (SECR Program)

Hypothesis 1: Participants in the experimental group will have better functional status than participants in the control group.

Hypothesis 2: After participating in the SECR Program, the participants in the experimental group will have better functional status than before participating in the program.

As expected, the results of the study supported hypothesis 1, that the participants in the experimental group had better functional status than the participants in the control group ($p < .001$) and also supported hypothesis 2-that after participating in the SECR Program, the participants in the experimental group had better functional status than before participating in the program ($p < .001$).

These results occurred due to the effect of the SECR Program. The SECR Program is a physiopsychosocial nursing intervention developed for improving the functional status of persons with MI. Both self-efficacy enhancement and family support were integral, in conjunction with cardiac rehabilitation, in providing a bio-psychosocial-behavioral approach. One significant family member participated in the program by providing support for each person with MI, along with the self-efficacy enhancement activities. The SECR Program allowed the persons with MI to increase their self-efficacy and perceived family support for cardiac rehabilitation during the first month after discharge. These increases of self-efficacy and perceived family support were confirmed in the experimental group (as shown in Chapter 3). These perceptions led the persons with MI to engage in practicing cardiac rehabilitation

which then affected their functional status improvement, as revealed in the results of this study. These findings are consistent with previous studies that found that self-efficacy played a role in the adoption of, adherence to, and performance of exercise-related activities of patients with coronary artery disease (Carlson et al., 2001; Jackson et al., 2005; Woodgate & Brawley, 2008). Sullivan et al. (1998) also found significantly higher self-efficacy among MI patients' predicted activities of daily living and physical, social, and leisure functional status at 1 month and 6 months. Similarly, improvements in self-efficacy and in the performance of exercise and daily activities were found with MI patients that participated in the self-efficacy promoting cardiac rehabilitation program at 4 weeks after discharge (Song, 2003). Furthermore, several previous studies found that family support significantly influenced positive outcomes (Dalteg et al., 2011; Tziallas & Tziallas, 2010) and adherence to cardiac rehabilitation programs.

The effects of the SECR Program are supported by social cognitive theory (SCT) (Bandura, 1986, 1997), in that "human behaviors operate within a triadic, dynamic, and reciprocal interaction of personal factors, behavioral, and environmental factors" (Bandura, 1986, 1997). Self-efficacy represents the cognitive aspect of personal factors relevant to the self- regulation of human capacity. Self-efficacy is the primary determinate of behavior, the effort to be expended, and the extent of persistence in the face of adversity. However, not only does self-efficacy have a potential influence on behavioral change, but also social influences, particularly family support within the environment, play an influential role in cognitive development and behavior change (Bandura, 1997). Previous studies reported that social support and self-efficacy were highly correlated and that self-

efficacy mediated social support and subsequent physical activity behavior (Anderson et al., 2006; McAuley et al., 2003; McNeill et al., 2006; Resnick et al., 2002).

Using four major sources of information based on self-efficacy theory (Bandura, 1986, 1997) to enhance self-efficacy in combination with family support were confirmed in this study as the significant strategies for increasing the practices of cardiac rehabilitation related to functional status improvement. This finding is consistent with the new trends of cardiac rehabilitation guidelines, which endorse the need to improve psychological care, suggesting that individualized support will improve the effectiveness of cardiac rehabilitation (Balady et al., 2007; The Heart Association of Thailand under the Royal Patronage of H.M. the King, 2010). How are these strategies effective in improving functional status? The participants in the experimental group began with promoting positive physiological and emotional states, including reducing their stressors through stress management techniques; and the participants were asked to share their symptom experiences. Then the researcher helped to reframe the symptoms and also explained how they could be a part of the recovery process. If the participant had false or unrealistic expectations, the researcher helped to correct those expectations and interpretations. These activities were important in preparing and getting to know the participants, and providing guidance information related to their concerns. Moreover, individual health education regarding cardiac rehabilitation consisted of verbal persuasion, which was necessary to enable the participants to understand their disease and which behaviors were necessary for their recovery. Exposure to a role model was a vicarious experience, which raised and strengthened their perceived self-efficacy by observing and/or sharing the performances of similar others that had successfully recovered.

All of these activities, as mentioned previously, were confirmed to have an influence on the initiation of perceived self-efficacy in relation to cardiac rehabilitation.

Assisting with realistic short- and long-term goal setting, skill training, using a diary for self-monitoring, discussion about the practices for cardiac rehabilitation currently performed, and giving feedback for achieving short-term goals were enactive mastery experiences. These activities were likely the most powerful mechanism in enhancing self-efficacy in this study because the participants had positive responses to learning about self-efficacy through personal experience or their actual performance accomplishments. This finding is consistent with Bandera's statement (Bandura, 1986, 1997), that enactive mastery experience is the most powerful mechanism in enhancing self-efficacy. Goal setting and self-monitoring by using the diary were also viewed as a type of self-regulation that could enhance and maintain self-efficacy. Self-regulation is the personal regulation of goal-directed behavior or performance (Bandura, 1986, 2001). The SCT suggests that behavior is changed through a combination of motivational and self-regulatory strategies (Bandura, 2004). Therefore, the influences of all of these activities supported the results in this study.

To increase the perceived family support, family members were invited to engage with the participants in all of the activities of the four major sources of information, and they also learned how to provide the participants with emotional, appraisal, informational, and instrumental support. The collaboration of family members appeared to be a positive action in promoting the participants to engage in the practices of cardiac rehabilitation with more self-confidence while at home.

Interestingly, increasing the self-efficacy and perceived family support to engage in the practices of cardiac rehabilitation that affected functional status improvement was supported in the real situation of the participants' practices at home by using telephone calls. The telephone calls were proactive, once a week for 3 weeks after discharge, and focused on the assignment in the diary. The results of this study confirmed that persons with MI after discharge needed monitoring to boost their self-efficacy to continually engage in the practices of cardiac rehabilitation. This is consistent with the recommendations by Carroll et al. (2001) and Hiltunen et al. (2005), who stated encouragement and support and validation and feedback were important telephone coaching techniques used by APNs to enhance the self-efficacy for the behavior change of the participants. On the other hand, the telephone calls were also provided to the family members at the same time to monitor their progress with family support and to remind them about providing support for the participants.

More important, it was found that both interventions elicited significant increases in functional status from baseline to 4 weeks. It can be concluded from this finding that physical recovery after an MI during a change of time was the only factor responsible for the functional status difference from baseline to 4 weeks in both groups. However, the functional status score in the control group was at a moderately low level, and was less than that of the experimental group; in fact, low-risk MI patients can achieve physical performance at a moderate to good level during the early period of cardiac recovery (Fleisher et al., 2007).

A possible reason to explain these findings is that the usual care and booklet that they received were focused on the delivery of facts about the disease and

cardiac rehabilitation. The participants in the control group played the role of being passive recipients of cardiac rehabilitation care, which affected their confidence in resuming their normal functions in daily living. Bandura (1997) has stated that if people lack self-efficacy they will likely behave ineffectually, even if they know what to do and how to do it. Moreover, they exhibited few skills, especially in relation to the walking exercise and the performance of daily activities, which could have negatively affected the walking exercise and the performance of daily activities compliance, particularly in a non-monitored environment, as at home. Even if some of the participants were physiologically capable, they may have lacked the self-efficacy to maintain the independent walking exercise and the performance of daily activities. In addition, it may be that during this vulnerable period, most Thai family members give patients support overprotectively. The overprotectiveness of family members after an MI may be attributed a reduction in the practices of cardiac rehabilitation. The results of this study indicated that the participants in the control group reported performing activities at just a light basic ADL level, such as taking care of their body-self, walking around the house, or doing household chores at a low-intense level. Therefore, a functional status decline was shown in this group. The use of the control group in this study strengthened the findings—that even in relation to cardiac rehabilitation content, the SECR Program was effective.

Implications for Nursing

Implications for nursing practice

The results of this study suggest that Bandura's social cognitive theory could be a useful framework for a cardiac rehabilitation program in clinical nursing practice. The SECR Program should be added to the usual care as a nursing practice guideline and should be implemented at secondary hospitals in Thailand. For the effective use of the program, the qualifications of nurses are required to implement the program; they should be nursed with experience in cardiac care of more than 3 years and/or be extensively trained to increase their expertise in cardiac care. The expertise of the nurse is a key factor in maintaining the effectiveness and sustainability of the program. More important, the program served a sample that lived in the northeastern region of Thailand, and mostly had a primary education. Therefore, nurses should be aware of the differences of the demographics of persons with MI when carry out the program with others.

Implications for nursing education

Based on the results of this study, functional status improvement was found in the experimental group through a multidimensional approach, particularly one incorporating cognitive and environmental factors. As the sense of self-efficacy and perceived family support increase, favorable functional status change is likely to occur. Thus, this knowledge should be included in the curriculum of cardiovascular nursing.

Implications for healthcare policy

The findings of this study imply that during the early recovery period, persons with MI need advanced clinical competencies, such as an expert knowledge base and skills, to achieve a functional status level. Promoting advanced practice nursing (APN) or short-term training in cardiovascular nursing in the Thai healthcare system is needed for caring for those persons.

Recommendations for Future Research

There are several notable recommendations for future research in this study. First, the SECR Program is an effective nursing intervention in promoting the functional status of persons with MI during the first month after discharge from the hospital. Further research that determines the long-term effects of the program is needed. Second, the measured functional status of persons with MI was carried out using a self-administered questionnaire and recall biases might have affected the results. Further research should incorporate an objective measure of functional status in order to verify the accuracy of the self-report measures used. Lastly, the SECR Program was developed by using Bandura's social cognitive theory as a guide for intervention. Further research that focuses on patients with other illnesses may extend the theory and also may explain functional status in a wide variety of nursing care situations.

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APPENDICES

APPENDIX A

Approval of Dissertation Proposal

ประกาศ

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

เรื่อง การอนุมัติหัวข้อดุษฎีนิพนธ์นิพนธ์ ครั้งที่ 2/2554 ประจำปีการศึกษา 2554

นิสิตผู้ทำวิจัยและอาจารย์ที่ปรึกษาดุษฎีนิพนธ์

รหัสนิสิต	5277975236
ชื่อ-นามสกุล	นางนิสากร วิบูลย์ชัย
สาขาวิชา	พยาบาลศาสตร์ (นานาชาติ)
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อาจารย์ที่ปรึกษาร่วม	ผู้ช่วยศาสตราจารย์ ดร. สุนิดา ปรีชาวงษ์
ประธานกรรมการสอบฯ	ศาสตราจารย์ ดร. สมจิต หนุเจริญกุล
กรรมการสอบฯ	รองศาสตราจารย์ ดร. สิริพันธุ์ สุวรรณมรรคา
กรรมการสอบฯ	รองศาสตราจารย์ ดร. จินตนา ยูนิพันธุ์
กรรมการสอบฯ	รองศาสตราจารย์ ดร. วราภรณ์ ชัยวัฒน์
ชื่อหัวข้อดุษฎีนิพนธ์	ผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย THE EFFECT OF THE INTEGRATED SELF-EFFICACY ENHANCEMENT AND FAMILY SUPPORT PROGRAM ON FUNCTIONAL STATUS IN MYOCARDIAL INFARCTION PATIENTS
ครั้งที่อนุมัติ	2/2554
ระดับ	ปริญญาเอก

จากมติคณะกรรมการบริหารคณะพยาบาลศาสตร์ ครั้งที่ 11/2555 วันที่ 24 เมษายน 2555

ประกาศ ณ วันที่ 27 เมษายน พ.ศ. 2555

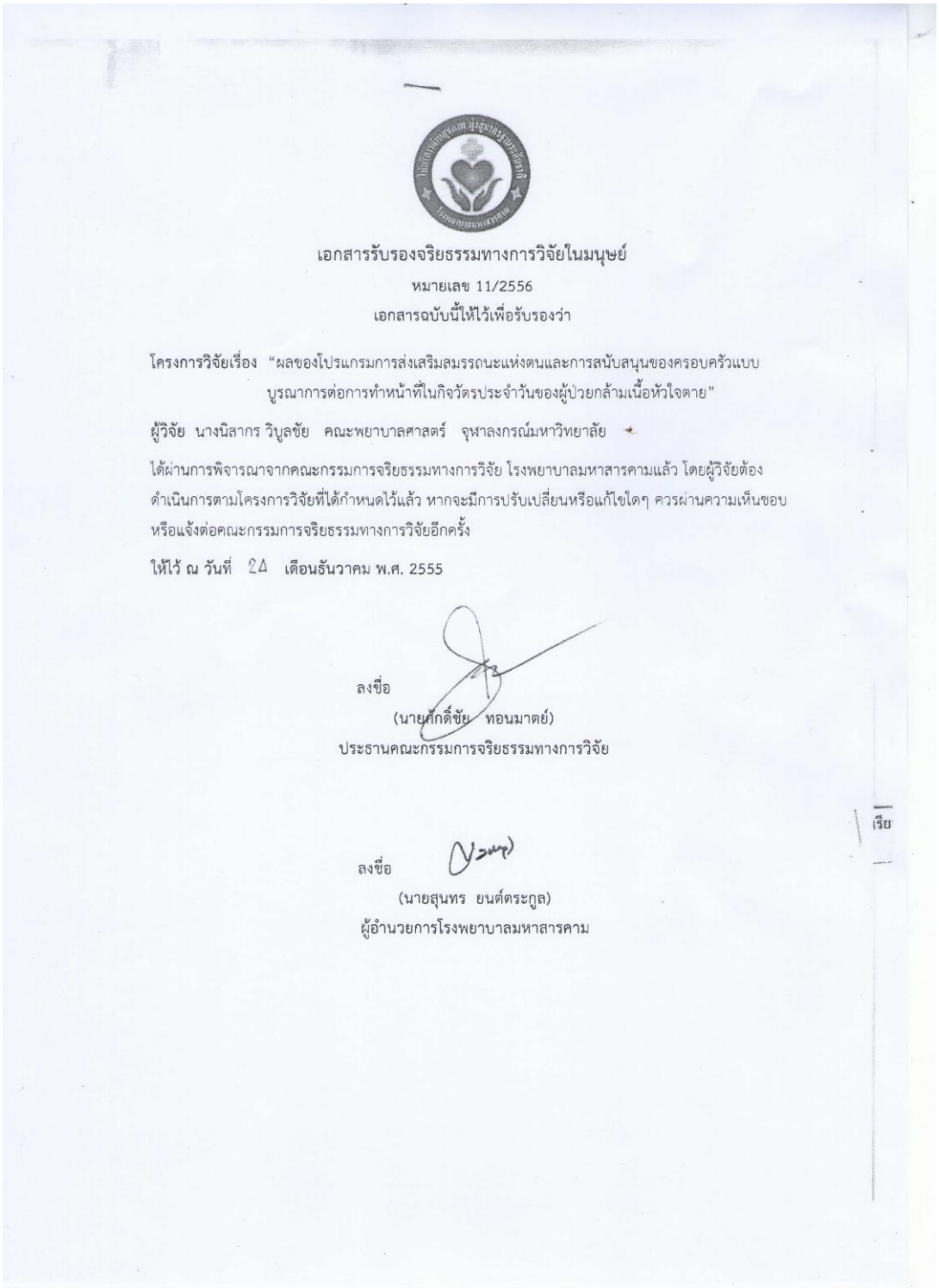
(รองศาสตราจารย์ ร.ต.อ.หญิง ดร. ยุพิน อังสุโรจน์)

คณบดีคณะพยาบาลศาสตร์

APPENDIX B

Documentary Proof of Ethical Clearance

Documentary proof of ethical clearance



เอกสารรับรองจริยธรรมทางการวิจัยในมนุษย์

หมายเลข 11/2556

เอกสารฉบับนี้ให้ไว้เพื่อรับรองว่า

โครงการวิจัยเรื่อง "ผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย"

ผู้วิจัย นางนิลากร วิบูลชัย คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ได้ผ่านการพิจารณาจากคณะกรรมการจริยธรรมทางการวิจัย โรงพยาบาลมหาสารคามแล้ว โดยผู้วิจัยต้องดำเนินการตามโครงการวิจัยที่ได้กำหนดไว้แล้ว หากจะมีการปรับเปลี่ยนหรือแก้ไขใดๆ ควรผ่านความเห็นชอบหรือแจ้งต่อคณะกรรมการจริยธรรมทางการวิจัยอีกครั้ง

ให้ไว้ ณ วันที่ 24 เดือนธันวาคม พ.ศ. 2555

ลงชื่อ

(นายภักดิ์ชัย ทอนมาตย์)

ประธานคณะกรรมการจริยธรรมทางการวิจัย

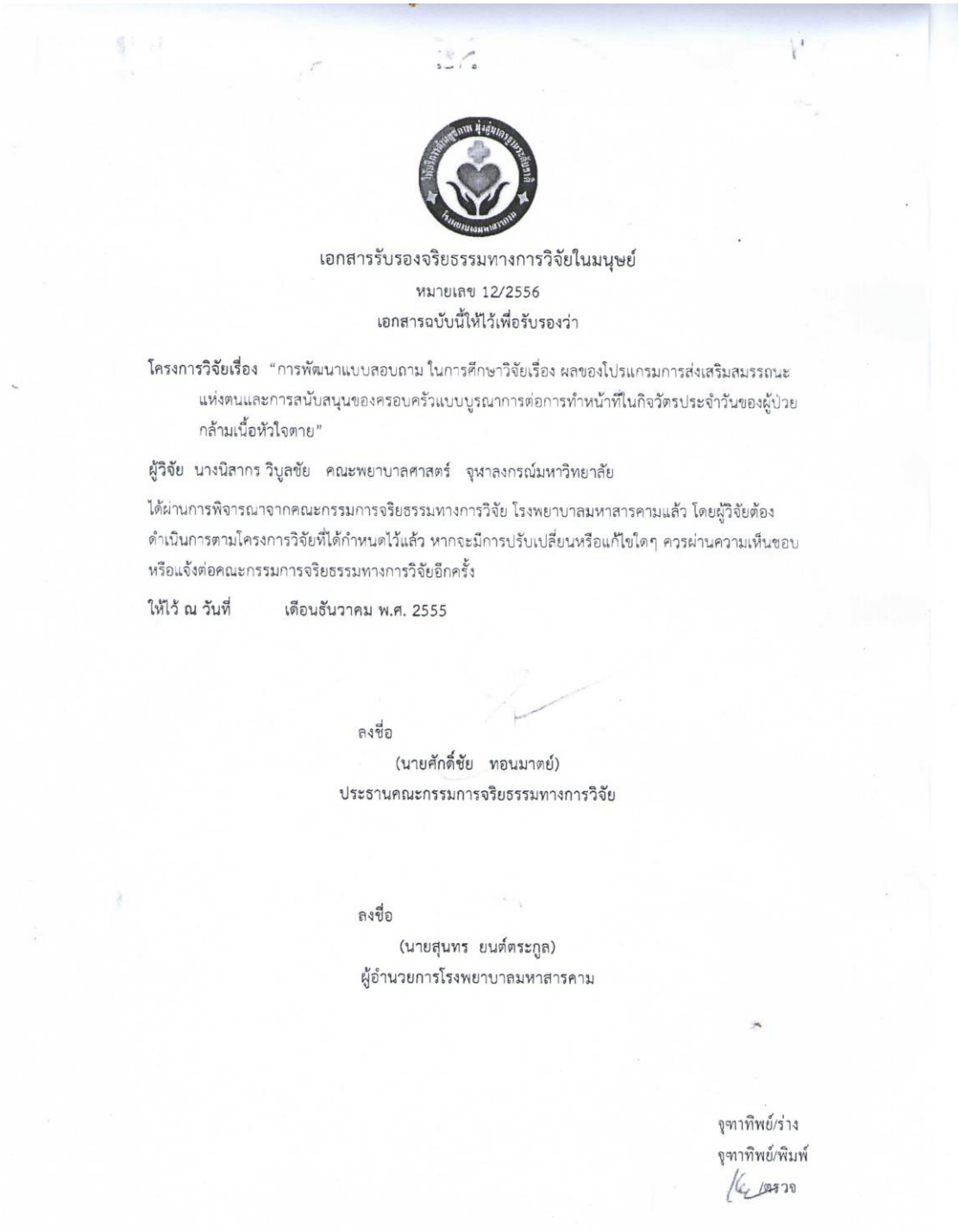
ลงชื่อ

(นายสุนทร ยนต์ตระกูล)

ผู้อำนวยการโรงพยาบาลมหาสารคาม

Documentary proof of ethical clearance

The Properties Testing of the Thai version of the Duke Activity Status Index



เอกสารรับรองจริยธรรมทางการวิจัยในมนุษย์

หมายเลข 12/2556

เอกสารฉบับนี้ให้ไว้เพื่อรับรองว่า

โครงการวิจัยเรื่อง "การพัฒนาแบบสอบถาม ในการศึกษาวิจัยเรื่อง ผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย"

ผู้วิจัย นางนิสากร วิบูลชัย คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ได้ผ่านการพิจารณาจากคณะกรรมการจริยธรรมทางการวิจัย โรงพยาบาลมหาสารคามแล้ว โดยผู้วิจัยต้องดำเนินการตามโครงการวิจัยที่ได้กำหนดไว้แล้ว หากจะมีการปรับเปลี่ยนหรือแก้ไขใดๆ ควรผ่านความเห็นชอบหรือแจ้งต่อคณะกรรมการจริยธรรมทางการวิจัยอีกครั้ง

ให้ไว้ ณ วันที่ เดือนธันวาคม พ.ศ. 2555

ลงชื่อ

(นายศักดิ์ชัย ทอนมาตย์)

ประธานคณะกรรมการจริยธรรมทางการวิจัย

ลงชื่อ

(นายสุนทร ยนต์ตระกูล)

ผู้อำนวยการโรงพยาบาลมหาสารคาม

จุฑาทิพย์/ร่าง

จุฑาทิพย์/พิมพ์

ตรวจ

Documentary proof of ethical clearance

The Properties Testing of the Thai version of the Duke Activity Status Index

รหัสใบอนุมัติ HEB-๐๘Nur-๕๖๐๑-๐๐๕

โรงพยาบาลกาฬสินธุ์
หนังสือฉบับนี้ให้ไว้เพื่อแสดงว่า

โครงการวิจัยเรื่อง : ผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย (The Properties Testing of the Instruments in the Study of the Effect of the Integrated Self-efficacy Enhancement and Family Support Program on Functional Status in Myocardial Infarction Patients)

ผู้วิจัย : นางนิสากร วิบูลชัย

หน่วยงานที่สังกัด : คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ได้ผ่านการรับรองจากคณะกรรมการจริยธรรมวิจัยในมนุษย์ โรงพยาบาลกาฬสินธุ์ โดยยึดหลักเกณฑ์ตามคำประกาศเฮลซิงกิ (Declaration of Helsinki) และแนวทางการปฏิบัติการวิจัยทางคลินิกที่ดี (ICH GCP) โดยขอให้รายงานความก้าวหน้าของโครงการวิจัยทุก ๑๒ เดือน

ให้ไว้ ณ วันที่ ๑๖ เดือนมกราคม พ.ศ. ๒๕๕๖

หมดอายุ วันที่ ๑๕ เดือนมกราคม พ.ศ. ๒๕๕๗

(นายแพทย์ประมวล ไทยงามศิลป์)
ประธานคณะกรรมการจริยธรรมวิจัยในมนุษย์
โรงพยาบาลกาฬสินธุ์

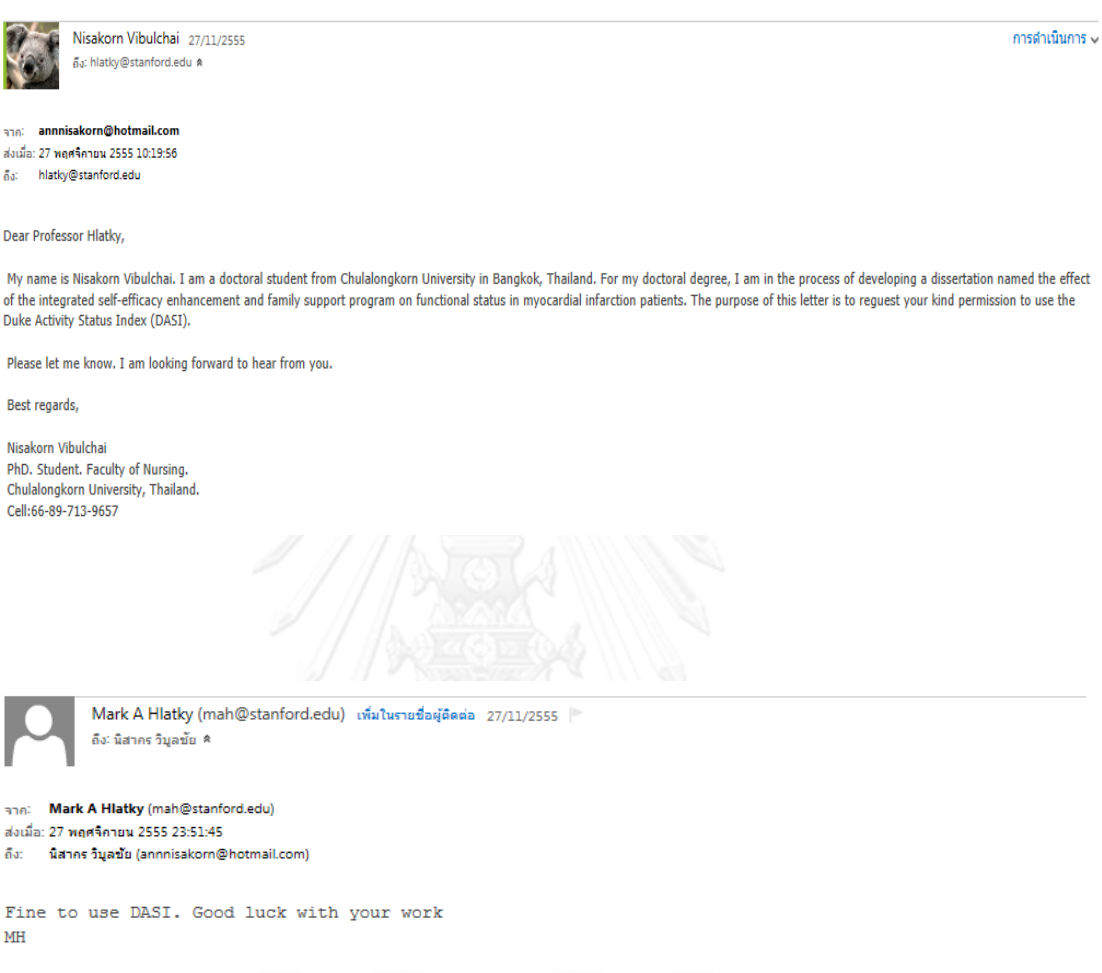
คณะกรรมการจริยธรรมวิจัยในมนุษย์ โรงพยาบาลกาฬสินธุ์
สำนักงาน : ศูนย์คุณภาพโรงพยาบาลกาฬสินธุ์ อำเภอเมือง จังหวัดกาฬสินธุ์
โทรศัพท์ ๐-๔๓๘๑-๑๐๒๐ ต่อ ๒๗๒๒

APPENDIX C

Permission for Using the Instruments

Instrument Name: The Duke Activity Status Index [DASI)

E-mail contact



Nisakorn Vibulchai 27/11/2555
ถึง: hlatky@stanford.edu

การดำเนินการ

จาก: **annnisakorn@hotmail.com**
ส่งเมื่อ: 27 พฤศจิกายน 2555 10:19:56
ถึง: hlatky@stanford.edu

Dear Professor Hlatky,

My name is Nisakorn Vibulchai. I am a doctoral student from Chulalongkorn University in Bangkok, Thailand. For my doctoral degree, I am in the process of developing a dissertation named the effect of the integrated self-efficacy enhancement and family support program on functional status in myocardial infarction patients. The purpose of this letter is to reguest your kind permission to use the Duke Activity Status Index (DASI).

Please let me know. I am looking forward to hear from you.

Best regards,

Nisakorn Vibulchai
PhD. Student. Faculty of Nursing.
Chulalongkorn University, Thailand.
Cell:66-89-713-9657

Mark A Hlatky (mah@stanford.edu) เพิ่มในรายชื่อผู้ติดต่อ 27/11/2555
ถึง: นิสากร วิบูลชัย

จาก: **Mark A Hlatky** (mah@stanford.edu)
ส่งเมื่อ: 27 พฤศจิกายน 2555 23:51:45
ถึง: **นิสากร วิบูลชัย** (annnisakorn@hotmail.com)

Fine to use DASI. Good luck with your work
MH

Instrument Name: The Maintain Function Subscale of the Cardiac Self-efficacy Scale [CSES]

E-mail contact

From: นิสากร วิบูลชัย [mailto:annnisakorn@hotmail.com]
Sent: Monday, November 26, 2012 10:31 PM
To: sullimar@u.washington.edu
Subject: Asking permission to use the Cardiac Self-efficacy Scale

Dear Professor Dr. Sullivan,

My name is Nisakorn Vibulchai. I am a doctoral student from Chulalongkorn University in Bangkok, Thailand. For my doctoral degree, I am in the process of developing a dissertation named the effect of the integrated self-efficacy enhancement and family support program on functional status in myocardial infarction patients. The purpose of this letter is to reguest your kind permission to use the Cardiac Self-efficacy Scale in part of maintain function.

Your kind permission would be highly appreciated. Please let me know. I am looking forward to hear from you.

Best re! gards,

Nisakorn Vibulchai
PhD. Student. Faculty of Nursing.
Chulalongkorn University, Thailand.
Cell:66-89-713-9657

Asking permission to use the Cardiac Self-efficacy Scale

Professor Dr. Sullivan 28/11/2555
ถึง: 'นิสากร วิบูลชัย'

การดำเนินการ

จาก: **Mark Sullivan** (sullimar@uw.edu)
ส่งเมื่อ: 28 พฤศจิกายน 2555 1:22:49
ถึง: 'นิสากร วิบูลชัย' (annnisakorn@hotmail.com)

Ms. Vibulchai
You are free to use the scale as long as you credit our original Psychosomatic Medicine paper and send us any Thai translation of the scale that you generate.

Mark Sullivan, MD, PhD
Psychiatry and Behavioral Sciences
University of Washington
Box 356560
Seattle, WA 98195
Phone:(206)685-3184
Fax: (206) 221-5414

Instrument Name: The SF-36

OPTUMInsight™

NON-COMMERCIAL LICENSE AGREEMENT
Office of Grants and Scholarly Research (OGSR)

License Number: QM019287

Effective Date: 06/01/13

Licensee Name: Nisakorn Vibulchai, c/o Chulalongkorn University

Licensee Address: Boromrajchonani Srisatpat Bld. Rama 1 Rd. Pathumwan Bangkok, Bangkok 10330

Approved Purpose: Non-commercial academic research and/or thesis – Unfunded Student.

Study Name: Validation of the Thai version of the Daily Activity Status Index (DASI-T) in patients with a previous myocardial infarction
Study Type: Unfunded student

Therapeutic Area: Heart and Circulation

Royalty Fee: None, because this License is granted in support of the non-commercial Approved Purpose

Other Definitions: As indicated on Appendix B "License Agreement – Details", including without limitation: Licensed Surveys, Modes, Fees, Administrations, Services, Approved Languages and (if applicable) License Term

Licensee accepts and agrees to the terms of this Non-Commercial License Agreement (the "Agreement") from the Office of Grants and Scholarly Research (OGSR) of OptumInsight Life Sciences, Inc. (f/k/a QualityMetric Incorporated) ("OptumInsight") as of the Effective Date.

Subject to the terms of this Agreement, including the OptumInsight Non-Commercial License Terms and Conditions attached as Appendix A: OptumInsight grants to Licensee, and Licensee accepts, a non-exclusive, non-transferable, non-assignable, non-sublicensable worldwide license to use, solely for the Approved Purpose and during the License Term, the Licensed Surveys in the authorized Modes and Approved Languages indicated on Appendix B and to administer the Licensed Surveys only up to the approved number of Administrations (and to make up to such number of exact reproductions of the Licensed Surveys necessary to support such Administrations) in any combination of the specific Licensed Surveys and Approved Languages and Modes and to use any related software provided by OptumInsight.

Capitalized terms used in this Agreement shall have the meanings assigned to them above, or in Appendices A and B attached hereto. Appendices A and B attached hereto are incorporated into and made a part of this Agreement for all purposes.

EXECUTED, as of the Effective Date, by the duly authorized representatives as set forth below.

OptumInsight Life Sciences, Inc. [OptumInsight]	**Nisakorn Vibulchai** [Licensee]
Signature: Michelle White	Signature: Nisakorn Vibulchai
Name: Michelle White	Name: Nisakorn Vibulchai
Title: Director of Consulting Science	Title: Mrs.
Date: 3 JUN 2013	Date: May 29, 2013

APPENDIX D

Participant Information Sheet & Informed Consent Form

ข้อมูลสำหรับประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย
(Participant information sheet)

ชื่อโครงการวิจัย ผลของโปรแกรมการส่งเสริมสรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย
ชื่อผู้วิจัย นางนิสากร วิบูลชัย
นิสิตปริญญาเอก คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
สถานที่ปฏิบัติงาน วิทยาลัยพยาบาลศรีมหาสารคาม
อำเภอเมือง จังหวัดมหาสารคาม
โทรศัพท์ที่ทำงาน043-711104
ที่อยู่ บ้านเลขที่ 368/2 ถนนรณชัยชาญยุทธ ตำบลในเมือง อำเภอเมือง
จังหวัดร้อยเอ็ด รหัสไปรษณีย์ 45000
โทรศัพท์ที่บ้าน 043-526506
โทรศัพท์เคลื่อนที่ 08-9713-9657
E-mail annnisakorn@hotmail.com

ข้อมูลที่เกี่ยวกับการให้คำยินยอมในการวิจัย ประกอบด้วยคำอธิบายดังต่อไปนี้

1. เหตุผลและความจำเป็นที่ต้องศึกษาวิจัย

ผู้ป่วยกล้ามเนื้อหัวใจตายที่ได้รับการรักษาด้วยยาภายหลังจำหน่ายออกจากโรงพยาบาล ในระยะ 1 เดือนแรก มักมีปัญหาของการทำหน้าที่ในกิจวัตรประจำวันลดลง ผู้ป่วยส่วนใหญ่มักทำกิจกรรมต่างๆในชีวิตประจำวันในระดับเบาๆ เช่น นั่งๆ นอนๆ อ่านหนังสือ หรือดูโทรทัศน์ เป็นต้น ในขณะที่การทำกิจกรรมที่ต้องใช้พลังงานในระดับสูงขึ้นไปที่สามารถช่วยฟื้นฟูสมรรถภาพหัวใจได้ดี เช่น การออกกำลังกาย การทำงานบ้าน กิจกรรมสันทนาการคลายเครียด เพศสัมพันธ์ และ การกลับมาทำงานอาชีพดังเดิม ผู้ป่วยกลับทำกิจกรรมเหล่านี้น้อย โดยมีสาเหตุที่สำคัญ คือ การขาดความมั่นใจในตัวเองและสมาชิกครอบครัวให้การปกป้องดูแลผู้ป่วยมากเกินไป ไม่อนุญาตให้ผู้ป่วยทำกิจกรรมเหล่านี้ด้วยตัวเอง เนื่องจากกลัวโรคจะกลับเป็นซ้ำ

การส่งเสริมความมั่นใจในการออกกำลังกายและทำกิจกรรมประจำวันอย่างถูกต้อง เหมาะสม ร่วมกับการเปิดโอกาสให้สมาชิกครอบครัวมีส่วนร่วมในการสนับสนุน จึงเป็นสิ่งจำเป็นในการเพิ่มขีดความสามารถของผู้ป่วยในการทำหน้าที่ในกิจวัตรประจำวัน ก่อให้เกิดการฟื้นฟูสมรรถภาพหัวใจที่ดี นำไปสู่ ภาวะสุขภาพ สามารถดำรงชีวิตอย่างเป็นปกติสุข

2. วัตถุประสงค์ของการวิจัย

เพื่อทดสอบประสิทธิผลของโปรแกรมฯ ต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย

3. ลักษณะของประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย

ผู้มีส่วนร่วมในการวิจัย คือ ผู้ป่วยโรคกล้ามเนื้อหัวใจตายและได้รับการรักษาด้วยยาเท่านั้นที่นอนรักษาตัวที่หอผู้ป่วยอายุรกรรม โรงพยาบาลมหาสารคาม จังหวัดมหาสารคาม

คุณลักษณะของผู้มีส่วนร่วมในการวิจัย

1. เป็นผู้ป่วยที่ได้รับการวินิจฉัยว่าเป็นโรคกล้ามเนื้อหัวใจตาย และได้รับการรักษาด้วยยาเท่านั้น

2. จัดอยู่ในประเภทผู้ป่วยมีความเสี่ยงต่ำ ได้แก่ ไม่มีอาการของหัวใจเต้นผิดจังหวะ หัวใจวาย ไม่มีประวัติการหยุดเต้นของหัวใจ ไม่มีภาวะแทรกซ้อนเกิดขึ้นภายหลังเกิดกล้ามเนื้อหัวใจตาย ไม่มีภาวะซึมเศร้า

3. ยินดีที่จะเข้าร่วมในการศึกษาวิจัย

4. มีสมาชิกครอบครัวที่เป็นผู้รับผิดชอบหลักในการดูแลผู้ป่วยขณะนอนรักษาตัวอยู่ที่โรงพยาบาลและเมื่อกลับไปอยู่ที่บ้าน

ผู้ป่วยจะถูกคัดออกจากการศึกษาวิจัย หากพบว่ามีประวัติของการรักษาด้วยการผ่าตัดหัวใจหรือได้รับการขยายหลอดเลือดหัวใจ มีอาการหอบเหนื่อย หายใจลำบาก อ่อนเพลียมาก เจ็บหน้าอกระดับสัญญาณชีพไม่คงที่ มีความดันโลหิตสูงที่ไม่สามารถควบคุมได้ โดยมีความดันช่วงบนมากกว่า 200 มิลลิเมตรปรอท ความดันช่วงล่างมากกว่า 100 มิลลิเมตรปรอท มีประวัติโรคเกี่ยวกับระบบทางเดินหายใจที่เรื้อรัง เช่น โรคปอดอุดกั้นเรื้อรัง หอบหืด เป็นต้น หรือมีปัญหาทางด้านสุขภาพเกี่ยวกับการเคลื่อนไหว เช่น ข้อหรือกล้ามเนื้ออักเสบ เป็นต้น

4. จำนวนของประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย

ผู้ป่วยกล้ามเนื้อหัวใจตายที่ได้รับการรักษาด้วยยา จำนวน 66 คน ที่รับไว้รักษาในหอผู้ป่วยอายุรกรรม

5. วิธีการศึกษาวิจัย

การศึกษาวิจัยครั้งนี้เป็นการวิจัยแบบทดลองและมีการสุ่มผู้ป่วยเข้ากลุ่มทดลองและกลุ่มควบคุม โดยกลุ่มทดลองได้รับโปรแกรมการส่งเสริมสรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการจากผู้วิจัย สำหรับกลุ่มควบคุมได้รับการพยาบาลตามปกติร่วมกับคู่มือการฟื้นฟูสภาพหัวใจกลับไปศึกษาที่บ้าน

โปรแกรมการส่งเสริมสรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการเป็นโปรแกรมทางการพยาบาลที่มุ่งเน้นทางด้านกาย จิต สังคม ในการส่งเสริมความมั่นใจในการออกกำลังกายและทำกิจกรรมประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตายที่ได้รับการรักษาด้วยยา เมื่อผู้ป่วยกลับไปอยู่ที่บ้านในระยะ 1 เดือนแรกภายหลังจำหน่ายออกจากโรงพยาบาล โดยครอบครัวมีส่วนร่วมในการสนับสนุน

กิจกรรมดำเนินการในการวิจัย ประกอบด้วยการให้โปรแกรมฯขณะผู้ป่วยนอนรักษาตัวที่โรงพยาบาล 3 ครั้ง โทรศัพท์ติดตาม 3 ครั้ง (สัปดาห์ที่ 1, 2, และ 3 ภายหลังจำหน่ายออกจากโรงพยาบาล) และประเมินผลการวิจัย 1 ครั้ง ในวันที่ผู้ป่วยมาพบแพทย์ตามนัด (สัปดาห์ที่ 4 ภายหลังจำหน่ายออกจากโรงพยาบาล) ที่แผนกผู้ป่วยนอก

การดำเนินกิจกรรมครั้งที่ 1

วัน/เวลา วันที่ 2 ของการนอนที่หอผู้ป่วยอายุรกรรม
ช่วงเย็น ใช้เวลา 40 นาที

กิจกรรม ประกอบด้วย

- การเปิดโอกาสให้ผู้ป่วยได้พูดคุยร่วมกับสมาชิกครอบครัวเกี่ยวกับประสบการณ์การเผชิญกับอาการของโรคกล้ามเนื้อหัวใจตาย
- การให้ข้อมูลและแปลความหมายที่ถูกต้องเกี่ยวกับอาการของโรคกล้ามเนื้อหัวใจตายที่เกิดขึ้นแก่ผู้ป่วยและสมาชิกครอบครัว
- การให้ความรู้แก่ผู้ป่วยและสมาชิกครอบครัว โดยการดูวีดีทัศน์ซึ่งมีเนื้อหา เกี่ยวกับโรคกล้ามเนื้อหัวใจตาย การออกกำลังกายและทำกิจกรรมประจำวันที่บ้าน และการปรับเปลี่ยนพฤติกรรมเสี่ยงอื่นๆ เพื่อส่งเสริมการออกกำลังกายและทำกิจกรรมประจำวันและป้องกันการกลับเป็นซ้ำของโรคกล้ามเนื้อหัวใจตาย
- การให้ผู้ป่วยและสมาชิกครอบครัวได้เห็นแบบอย่างที่ดีในการปฏิบัติตัวจากผู้ป่วยต้นแบบโดยการดูวีดีทัศน์
- การช่วยเหลือให้ผู้ป่วยได้กำหนดเป้าหมายและแผนการปฏิบัติตัว โดยสมาชิกครอบครัวมีส่วนร่วม

การดำเนินกิจกรรมครั้งที่ 2 และ 3

วัน/เวลา วันที่ 3 ของการนอนที่หอผู้ป่วยอายุรกรรม
ช่วงเช้า ใช้เวลา 40 นาที
ช่วงบ่าย ใช้เวลา 40 นาที

กิจกรรม ประกอบด้วย

- การฝึกทักษะเกี่ยวกับ การจับชีพจร การประเมินความเหนื่อย การอบอุ่นร่างกายก่อนเดินออกกำลังกายและการคลายกล้ามเนื้อหลังเดินออกกำลังกาย เทคนิคการสงวนพลังงานในการทำกิจกรรมประจำวัน
- การฝึกทักษะเกี่ยวกับ การจัดการอาการเจ็บหน้าอก
- การฝึกทักษะเกี่ยวกับการบันทึก ติดตามกำกับและประเมินผลการเดินออกกำลังกายและทำกิจกรรมประจำวัน ในสมุดบันทึกการปฏิบัติตัวของผู้ป่วย

การดำเนินกิจกรรมครั้งที่ 4

การติดตามกำกับการปฏิบัติตัวในการฟื้นฟูสภาพหัวใจ

ผู้ป่วยจะได้รับการส่งเสริมความมั่นใจในการเดินออกกำลังกายและทำกิจกรรมประจำวันอย่างต่อเนื่องที่บ้าน โดยการช่วยเหลือและติดตามกำกับจากสมาชิกในครอบครัวร่วมกับการบันทึกและประเมินผลการปฏิบัติในสมุดบันทึก และมีการติดตามเยี่ยมทางโทรศัพท์จากผู้วิจัย จำนวน 3 ครั้ง (สัปดาห์ที่ 1, 2, 3 ภายหลังจำหน่ายออกจากโรงพยาบาล)

6. การเก็บรวบรวมข้อมูล

เมื่อท่านตัดสินใจเข้าร่วมการวิจัยแล้ว ท่านจะเป็นผู้มีส่วนร่วมในการวิจัย ซึ่งจำเป็นต้องตอบแบบสอบถามเกี่ยวกับ 1) ข้อมูลส่วนบุคคลสำหรับผู้ป่วย 2) แบบสอบถาม “ดัชนีประเมิน

ระดับสมรรถภาพของการมีกิจกรรมประจำวัน” โดยใช้เวลาในการตอบแบบสอบถาม ประมาณ 5-10 นาที

เมื่อท่านมาตรวจตามแพทย์นัดภายหลังจำหน่ายออกจากโรงพยาบาล ในสัปดาห์ที่ 4 ท่านจำเป็นต้องตอบแบบสอบถาม “การรับรู้สมรรถนะแห่งตนในการออกกำลังกายและทำกิจกรรมประจำวัน” “แบบสอบถามการรับรู้การสนับสนุนทางสังคมจากครอบครัว” และ “ดัชนีประเมินระดับสมรรถภาพของการมีกิจกรรมประจำวัน” โดยใช้เวลาในการตอบแบบสอบถามทั้งสิ้นประมาณ 10-15 นาที

7. ประโยชน์ที่คาดว่าจะได้รับจากโครงการวิจัย

การพัฒนาโปรแกรมการส่งเสริมสรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการ ที่มุ่งเน้นการส่งเสริมการรับรู้สมรรถนะตนเองในการออกกำลังกายและทำกิจกรรมประจำวัน เป็นการฟื้นฟูสมรรถภาพหัวใจในผู้ป่วยกล้ามเนื้อหัวใจตาย ที่สามารถส่งเสริมให้หัวใจของผู้ป่วยมีการฟื้นคืนสู่ภาวะปกติ ก่อให้เกิดภาวะสุขภาพและคุณภาพชีวิตที่ดี การนำโปรแกรมนี้ไปใช้จะช่วยให้พยาบาลสามารถปฏิบัติการพยาบาลได้อย่างมีประสิทธิภาพ ช่วยยกระดับคุณภาพชีวิตผู้ป่วยและช่วยลดค่าใช้จ่ายในการรักษาพยาบาลโรคกล้ามเนื้อหัวใจตายได้ นอกจากนี้สามารถนำผลการศึกษาวิจัยนี้ไปใช้ในการกำหนดนโยบายและมาตรฐานการพยาบาลในการดูแลผู้ป่วยโรคกล้ามเนื้อหัวใจตายต่อไปได้

8. ความเสี่ยงหรือความไม่สุขสบายที่คาดว่าจะได้รับในการเข้าร่วมงานวิจัย การป้องกันความเสี่ยงและการแก้ไขกรณีเกิดปัญหา

ความเสี่ยงที่อาจจะเกิดขึ้นเมื่อเข้าร่วมวิจัย ผู้มีส่วนร่วมในการวิจัยอาจเกิดอาการอ่อนเพลียขณะที่ท่านตอบแบบสอบถาม ท่านสามารถพักระหว่างตอบแบบสอบถามได้ สำหรับผู้มีส่วนร่วมในกลุ่มทดลอง ท่านอาจเกิดอาการเหนื่อยอ่อนเพลียบ้าง ขอให้ท่านมั่นใจว่าเมื่อท่านปฏิบัติตามโปรแกรมฯ จะไม่เกิดอันตรายร้ายแรงกับท่านเนื่องจากโปรแกรมนี้ได้ผ่านการศึกษาค้นคว้ามาเป็นอย่างดี มีการนำไปใช้อย่างแพร่หลายในผู้ป่วยโรคกล้ามเนื้อหัวใจตายนานาประเทศทั่วโลก และผ่านการตรวจสอบจากผู้เชี่ยวชาญด้านโรคกล้ามเนื้อหัวใจตายในประเทศไทย จำนวน 5 ท่าน กรณีที่ท่านมีอาการผิดปกติระหว่างการเข้าร่วมศึกษาวิจัยนี้ ท่านจะได้รับการดูแลช่วยเหลือปฐมพยาบาลเบื้องต้นตามมาตรฐานการดูแลผู้ป่วยโรคกล้ามเนื้อหัวใจตายจากผู้วิจัย

9. สิทธิของผู้เข้าร่วมโครงการวิจัยและการถอนตัวออกจากโครงการวิจัยหลังจากได้ลงนามเข้าร่วมโครงการวิจัย

ผู้มีส่วนร่วมในการวิจัยมีสิทธิ์ปฏิเสธหรือถอนตัวจากโครงการวิจัยนี้ได้ตลอดเวลาโดยไม่ต้องแจ้งให้ทราบล่วงหน้า และการไม่เข้าร่วมการวิจัยหรือถอนตัวออกจากโครงการวิจัยจะไม่มีผลกระทบต่อการบริการและการรักษาที่สมควรจะได้รับแต่ประการใด

หากมีข้อมูลเพิ่มเติมทั้งด้านประโยชน์และโทษที่เกี่ยวข้องการวิจัยนี้ ผู้วิจัยจะแจ้งให้ทราบโดยรวดเร็วไม่ปิดบัง

10. ขอบเขตการดูแลรักษาความลับของข้อมูลต่างๆของผู้เข้าร่วมโครงการ

การรักษาความลับของผู้มีส่วนร่วมในการวิจัย ข้อมูลส่วนตัวของท่านที่ได้จากแบบสอบถามจะถูกเก็บรักษาไว้ในที่ปลอดภัยและเป็นความลับไม่เปิดเผยต่อสาธารณ นำไปวิเคราะห์โดยการลงรหัสและวิเคราะห์ในภาพรวมไม่แยกเฉพาะรายเป็นรายบุคคล ผลการวิจัยจะนำเสนอในภาพรวม

11. ค่าตอบแทนที่จะได้รับเมื่อเข้าร่วมโครงการวิจัย

การวิจัยครั้งนี้ไม่มีการจ่ายค่าตอบแทนแก่ผู้มีส่วนร่วมในการวิจัย และผู้มีส่วนร่วมในการวิจัยไม่มีค่าใช้จ่ายใด ๆ เพิ่มเติมทั้งสิ้น

12. หากมีปัญหาหรือข้อสงสัยที่เกี่ยวข้องกับโครงการวิจัย

หากท่านอ่านเอกสารนี้แล้วยังมีข้อความที่ท่านไม่เข้าใจ ท่านสามารถสอบถามผู้วิจัยได้ทันที หรืออาจปรึกษาหารือกับญาติพี่น้อง เพื่อนสนิท แพทย์ประจำตัวของท่าน หรือแพทย์ท่านอื่น ก่อนการตัดสินใจเข้าร่วมหรือไม่เข้าร่วมการศึกษาวิจัยได้

ท่านสามารถติดต่อสอบถามเพิ่มเติมจากผู้วิจัยได้ตลอดเวลาที่ นางนิสากร วิบูลชัย วิทยาลัยพยาบาลศรีมหาสารคาม อำเภอเมือง จังหวัดมหาสารคาม โทรศัพท์ 089-7139657

13. แหล่งให้ข้อมูลหากมีข้อสงสัยเกี่ยวกับสิทธิผู้มีส่วนร่วมในการวิจัย

หากท่านได้รับการปฏิบัติไม่ตรงตามที่ได้ระบุไว้ในข้อมูลสำหรับประชากรตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย ท่านจะสามารถติดต่อที่สำนักงานคณะกรรมการจริยธรรมการวิจัยในมนุษย์ โรงพยาบาลมหาสารคาม หมายเลขโทรศัพท์ 043-741225

ขอขอบคุณในความร่วมมือของท่านมา ณ ที่นี้

ใบยินยอมของผู้มีส่วนร่วมในการวิจัย

(Informed Consent Form)

ชื่อโครงการ : ผลของโปรแกรมการส่งเสริมสรรถนะแห่งตนและการสนับสนุนของครอบครัว แบบบูรณาการต่อการทำหน้าที่ในกิจวัตรประจำวันของผู้ป่วยกล้ามเนื้อหัวใจตาย

เลขที่ผู้มีส่วนร่วมในการวิจัย.....

ข้าพเจ้าได้รับทราบข้อมูลจากผู้วิจัย ชื่อ นางนิสากร วิบูลชัย นิสิตปริญญาเอก หลักสูตรพยาบาลศาสตรดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ถึงวัตถุประสงค์ ลักษณะและแนวทางการวิจัย รวมทั้งรับทราบถึงผลดีและความเสี่ยงที่อาจจะเกิดขึ้น โดยข้าพเจ้าได้ซักถาม ทำความเข้าใจเกี่ยวกับการศึกษาดังกล่าว เป็นที่เรียบร้อยแล้ว

ข้าพเจ้ายินดีเข้าร่วมการศึกษาครั้งนี้โดยสมัครใจ และมีสิทธิที่จะขอออกจากการเข้าร่วมการวิจัยนี้ได้ทุกเวลา โดยไม่จำเป็นต้องแจ้งเหตุผล ซึ่งไม่เกิดผลเสียใดๆ ต่อข้าพเจ้าและครอบครัว โดยผู้วิจัยรับรองว่าจะเก็บข้อมูลที่ได้จากการตอบแบบสอบถามไว้เป็นความลับ เก็บรักษาไว้ในที่ปลอดภัยและจะทำลายข้อมูลดังกล่าวเมื่อเสร็จสิ้นการใช้ข้อมูลตามวัตถุประสงค์ของการวิจัย และจะเปิดเผยเพียงผลการวิจัยโดยไม่มีข้อมูลส่วนบุคคลแต่อย่างใด

หากข้าพเจ้ามีข้อข้องใจหรือข้อคำถามใดๆ ที่เกี่ยวข้องในการวิจัยดังกล่าวหรือหากเกิดผลข้างเคียงที่ไม่พึงประสงค์จากการวิจัยขึ้นกับข้าพเจ้า ข้าพเจ้าสามารถติดต่อสอบถามผู้วิจัยซึ่งอาศัยอยู่ ณ บ้านเลขที่ 368/2 ถนนรณชัยชาญยุทธ ตำบลในเมือง อำเภอเมือง จังหวัดร้อยเอ็ด รหัสไปรษณีย์ 45000 โทรศัพท์ 043-526506 โทรศัพท์เคลื่อนที่ 08-9713-9657 ได้ตลอดเวลา

ข้าพเจ้าได้เข้าใจข้อความในเอกสารชี้แจงผู้มีส่วนร่วมในการวิจัย และใบยินยอมของผู้มีส่วนร่วมในการวิจัยนี้โดยตลอดแล้ว ข้าพเจ้ายินดีเข้าร่วมการศึกษานี้ภายใต้เงื่อนไขที่ได้ระบุไว้ในข้างต้น จึงลงลายมือชื่อไว้ ณ ที่นี้

.....	.....
(.....)	(นางนิสากร วิบูลชัย)
ลงนามผู้มีส่วนร่วมในการวิจัย	ลงนามผู้วิจัย

.....

(.....)

ลงนามพยาน

...../.....

สถานที่/วันที่

APPENDIX E

Research Instruments

Demographic Data Form (Thai Version)

แบบสอบถามข้อมูลส่วนบุคคล

ส่วนที่ 1 ข้อมูลทั่วไป

คำชี้แจง: โปรดใส่เครื่องหมาย √ ลงในช่อง ☐ ที่ตรงกับตัวท่านมากที่สุดและระบุข้อมูลในช่องว่าง

1. อายุ.....ปี
2. เพศ ☐ชาย ☐ หญิง
3. สถานภาพสมรส ☐คู่ ☐โสด ☐ หม้าย
   ☐หย่า/แยกกันอยู่ ☐ อื่น ๆ .....
4. การศึกษา ☐ประถม ☐มัธยม ☐ อนุปริญญา
   ☐ ปริญญาตรี ☐ อื่น ๆ .....
5. .....
   .....

ส่วนที่ 2 ข้อมูลเกี่ยวกับปัจจัยเสี่ยงที่เกี่ยวข้องกับการเจ็บป่วย

คำชี้แจง: โปรดใส่เครื่องหมาย √ ลงในช่อง ☐ ที่ตรงกับตัวท่านมากที่สุดและระบุข้อมูลในช่องว่าง

1. โรคประจำตัวอื่น ๆ ☐ความดันโลหิตสูง ☐ เบาหวาน
   ☐ ไขมันในเลือดสูง ☐ โรคไตวาย
   ☐ อื่น ๆ ..... ☐ ปฏิเสธการมีโรคประจำตัว
2. การสูบบุหรี่ ☐ ไม่เคยสูบบุหรี่ ☐ เลิกสูบบุหรี่แล้ว
   ☐ ยังสูบบุหรี่อยู่

   .....
   . .....

ส่วนที่ 3 ข้อมูลเกี่ยวกับการเจ็บป่วยขณะนอนในโรงพยาบาล (บันทึกจากแฟ้มประวัติผู้ป่วย)

1. การวินิจฉัยโรค ☐ NSTEMI ☐ STEMI
2. EKG.....
   Cardiac Wall Infarction ☐ Septal ☐ Extensive anterior ☐ Anterosep
   ☐ Anterolateral ☐ Inferior ☐ Lateral ☐ Inferior & Anteroseptal
   ☐ Inferior & Anterolateral ☐ Inferior & Extensive anterior

   .....
   . .....

The Thai version of the Daily Activity Status Index (DASI-T)

ดัชนีประเมินระดับสมรรถภาพของการมีกิจกรรมประจำวัน

<u>คำชี้แจง</u> กรุณาทำเครื่องหมาย √ ในช่อง ☐ ที่ตรงกับ**<u>ขีดความสามารถในการทำกิจกรรมของคุณโดยไม่เหนื่อย</u> ในขณะนี้**

ข้อ	กิจกรรม	ทำได้	ทำไม่ได้	METs
1	คุณสามารถดูแลตนเองในการรับประทานอาหาร แต่งตัว อาบน้ำ หรือเข้าส้วม ได้หรือไม่			2.75
2	.....			1.75
3	.....			.....
4	.....			.....
5	.....			.....
6	.....			.....
7	.....			.....
8	.....			.....
9	.....			.....
10	.....			.....
11	.....			.....
12	คุณสามารถเล่นหรือร่วมแข่งขันกีฬาที่ต้องออกแรงมาก เช่น ว่ายน้ำ เล่นเทนนิสเดี่ยว ฟุตบอล บาสเกตบอล ตะกร้อ ปั่นจักรยานเร็วๆ ได้หรือไม่			7.50

The Cardiac Self-efficacy Scale (CSES) (Thai version)

แบบสอบถามการรับรู้สมรรถนะแห่งตน

คำชี้แจง: กรุณาอ่านในแต่ละข้อ และกาเครื่องหมายถูก (√) ในช่องที่ตรงกับความมั่นใจในตัวเองของท่านว่า **ท่านมีมากน้อยเพียงใดในสิ่งที่ท่านรู้ หรือ สามารถทำได้**

คำถาม	ไม่มั่นใจเลย (0)	มั่นใจเล็กน้อย (1)	มั่นใจปานกลาง (2)	มั่นใจมาก (3)	มั่นใจมากที่สุด (4)
1. ท่านมีความมั่นใจเพียงใดที่จะควบคุมอาการแน่นหน้าอกด้วยการปรับเปลี่ยนระดับของกิจกรรมที่ท่านทำ					
2.....					
3.....					
4.....					
5.ท่านมีความมั่นใจเพียงใดที่จะทำการออกกำลังกายอย่างสม่ำเสมอ (ออกกำลังกายถึงขนาดเหงื่อออก หรือหัวใจเต้นเร็วขึ้น)					

The Family Support Questionnaire (Thai version)

แบบสอบถามการรับรู้การสนับสนุนทางสังคมจากครอบครัว

ส่วนที่ 1 ข้อมูลการรับรู้การสนับสนุนทางสังคมจากครอบครัวในการออกกำลังกาย

คำชี้แจง: โปรดกาเครื่องหมาย (/) ลงในช่องที่ตรงกับการรับรู้ของท่าน

เกณฑ์ในการตอบคำถาม

ดีมาก หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพดีมาก (80-100%)
ค่อนข้างดี หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพค่อนข้างดี (70-79%)
ปานกลาง หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพปานกลาง (60-69%)
ค่อนข้างไม่ดี หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพค่อนข้างไม่ดี (50-59%)
ไม่ดีเลย หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพไม่ดีเลย (<50%)

ข้อความ	ดีมาก	ค่อนข้างดี	ปานกลาง	ค่อนข้างไม่ดี	ไม่ดีเลย
ด้านอารมณ์					
1.ท่านได้รับการดูแลเอาใจใส่จากสมาชิกครอบครัวในการเดินออกกำลังกาย					
ด้านการประเมินค่า					
4. ท่านได้รับคำพูดยกย่องชมเชยเมื่อท่านเดินออกกำลังกายได้ถูกต้องตามวิธีที่กำหนด					
ด้านข้อมูลข่าวสาร					
7. ท่านได้รับข้อมูลเกี่ยวกับการเดินออกกำลังกายจากสมาชิกครอบครัว					
ด้านทรัพยากร					
9. ท่านได้รับการสนับสนุนเวลาจากสมาชิกครอบครัวในการเดินออกกำลังกาย					

ส่วนที่ 2 ข้อมูลการรับรู้การสนับสนุนทางสังคมจากครอบครัวในการทำกิจกรรมประจำวัน

คำชี้แจง: โปรดกาเครื่องหมาย (/) ลงในช่องที่ตรงกับการรับรู้ของท่าน

เกณฑ์ในการตอบคำถาม

ดีมาก หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพดีมาก (80-100%)
ค่อนข้างดี หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพค่อนข้างดี (70-79%)
ปานกลาง หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพปานกลาง (60-69%)
ค่อนข้างไม่ดี หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพค่อนข้างไม่ดี (50-59%)
ไม่ดีเลย หมายถึง ได้รับสนับสนุนจากสมาชิกครอบครัวในระดับคุณภาพไม่ดีเลย (<50%)

ข้อความ	ดีมาก	ดี	ปานกลาง	ค่อนข้างไม่ดี	ไม่ดีเลย
ด้านอารมณ์					
1.ท่านได้รับการดูแลเอาใจใส่จากสมาชิกครอบครัวในการทำกิจกรรมประจำวัน					
ด้านการประเมินค่า					
4. ท่านได้รับคำพูดยกย่องชมเชยเมื่อท่านทำกิจกรรมประจำวันได้ถูกต้องตามโปรแกรมที่กำหนด					
ด้านข้อมูลข่าวสาร					
7. ท่านได้รับข้อมูลเกี่ยวกับการทำกิจกรรมประจำวันจากสมาชิกครอบครัว					
ด้านทรัพยากร					
9. ท่านได้รับการสนับสนุนเวลาจากสมาชิกครอบครัวในการทำกิจกรรมประจำวัน					

Program Manual (Thai Version)

โปรแกรมการส่งเสริมสรรถนะในการฟื้นฟูสภาพหัวใจ
สำหรับผู้ป่วยโรคกล้ามเนื้อหัวใจตาย

Contents

APPENDIX F

Script DVD

สคริปต์วีดิทัศน์ ชุดที่ 1
เรื่อง ความรู้เกี่ยวกับโรคกล้ามเนื้อหัวใจตาย

ลำดับ	ภาพ	เสียง
1	ภาพเคลื่อนไหว :หัวใจเต้น	เสียงหัวใจเต้น
2	อักษรกราฟฟิค โรคกล้ามเนื้อหัวใจตาย	เสียงบรรยาย: วีดีทัศน์ชุดนี้เป็นการนำเสนอสาระน่ารู้เกี่ยวกับโรคกล้ามเนื้อหัวใจตาย เพื่อให้ผู้ป่วยและสมาชิกครอบครัวได้มีความรู้ความเข้าใจเกี่ยวกับโรคที่ผู้ป่วยเป็นอยู่อย่างถูกต้อง
3	ภาพเคลื่อนไหว ชายวัยสูงอายุกำลังนอนพักผ่อนใต้ต้นไม้บริเวณหน้าบ้าน มีบุตรสาวนั่งเล่นอยู่ข้างๆ	ผู้ป่วย: อีหล่า พ่อคื่อฮู้สึกเมื่อยๆ แท้ พาพ่อไปนอนพักข้างในบ้านแน๊ บุตรสาว: จ้ะพ่อ
4	ภาพ: ชายวัยสูงอายุลุกขึ้น กำลังจะก้าวเดิน แล้วทรุดฮวบลง มือกุมที่บริเวณหน้าอกซ้าย เหงื่อออกมากที่ใบหน้า	ผู้ป่วย: โอ๊ย! โอ๊ย! ภรรยา: พ่อเจ้าเป็นหยัง ผู้ได่ก็ได้ซ่อยแน้ ซ่อยแน้ สามี: พ่อแน่นหน้าอก เจ็บหลาย พาพ่อไปโรงพยาบาลแน๊
5	ภาพ: พยาบาลรับโทรศัพท์ 1669 ภาพ: รถฉุกเฉินวิ่งไปรับผู้ป่วยที่บ้าน ภาพ: บริเวณหน้าห้องฉุกเฉิน	เสียงไซเรนรถฉุกเฉิน
6-11	.....	.....
12	ภาพพยาบาลกำลังพูด	**พยาบาล:** ต่อไปเราจะมาเรียนรู้เกี่ยวกับการออกกำลังกายและทำกิจกรรมประจำวันที่เหมาะสมกับสภาพความเจ็บป่วยที่บ้านกันค่ะ
13	ภาพ: พยาบาลกำลังพูด	เรื่องราวต่อจากนี้จะเป็นการนำเสนอผู้ป่วยต้นแบบที่ประสบความสำเร็จในการออกกำลังกายและมีการทำกิจกรรมประจำวันที่เหมาะสม มีการดำรงชีวิตอย่างเป็นปกติสุข เรามารู้จักกับผู้ป่วยต้นแบบนี้กันค่ะ.....

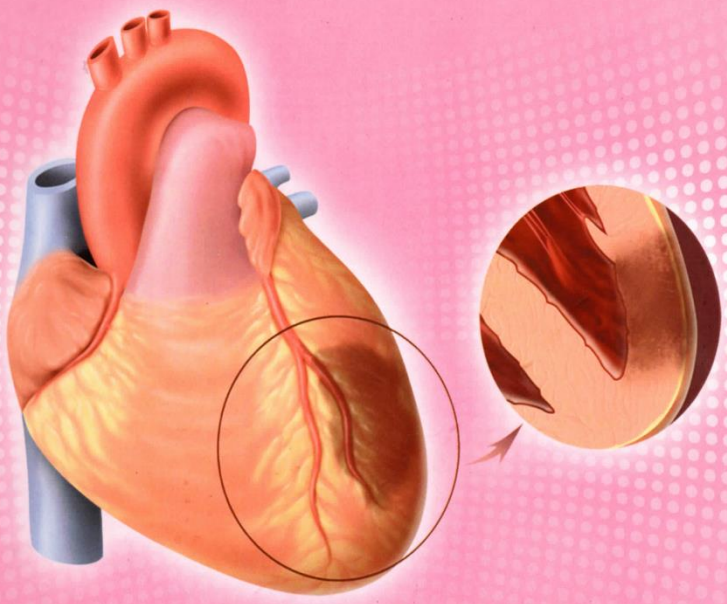
สคริปต์วีดิทัศน์ ชุดที่ 2
การนำเสนอผู้ป่วยต้นแบบ

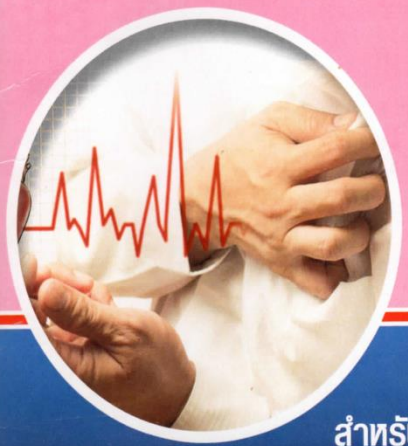
ลำดับ	ภาพ	เสียง
1	**ภาพ:** พยาบาลกำลังเดินเข้าไปไปเยี่ยมผู้ป่วยที่บ้าน	**พยาบาล:** สวัสดีค่ะ คุณลุง
2	**ภาพ:** ผู้ป่วยนั่งเล่นอยู่หน้าบ้านกับญาติ	**ผู้ป่วย:** สวัสดีครับ มาจังได๋ ถึงมาถึงบ้านลุงได้ เชิญนั่งก่อนครับ เอาน้ำมาให้คุณพยาบาลเพิ่นแน๋ เพิ่นมาเยี่ยมเฮา
3	**ภาพ:** ผู้ป่วยและพยาบาลนั่งสนทนากัน	**พยาบาล:** ขอบคุณค่ะ วันนี้ทางโรงพยาบาลออกบริการเยี่ยมบ้านผู้ป่วยในหมู่บ้านนี้ค่ะ ดิฉันเลยถือโอกาสมาเยี่ยมคุณลุงด้วย หลังจากที่ออกจากโรงพยาบาลมาเมื่อเดือนที่แล้ว **พยาบาล:** ตอนนี้อาการคุณลุงเป็นอย่างไรบ้างคะ **ผู้ป่วย:** ก็ปกติดี เฮ็ดเวียกงานได้ บ่เมื่อย บ่มีอาการอิหยังเลย **พยาบาล:** ดีค่ะ งั้นดิฉันขอตรวจวัดชีพจร การเต้นของหัวใจและความดันเลือดของคุณลุงนะคะ
4-28	.....	.....
29	**ภาพ:** พยาบาลยืนพูดที่หน้าป้ายบ้านผู้ป่วย ภาพ: กล้องซูมไปที่หน้าพยาบาล	พยาบาล : “เมื่อความเจ็บป่วยมาเยือน อาจทำให้หวาดหวั่นท้อแท้กับชีวิต จนบางคนคิดว่าคงไม่มีโอกาสอีกแล้วในการกลับคืนสู่ความปกติสุขดังเดิม เวลาผ่านไปเราได้เรียนรู้ว่ายังมีความปกติสุขอยู่จริงในยามเจ็บป่วย เรื่องราวสุขภาพเกี่ยวกับ..... สำหรับวันนี้ การนำเสนอข้อมูลผู้ป่วยต้นแบบ คงต้องจบลงเพียงเท่านี้ สวัสดีค่ะ”

APPENDIX G

Booklet

คู่มือผู้ป่วยโรคกล้ามเนื้อหัวใจตาย และสมาชิกครอบครัว





สำหรับใช้ในโปรแกรมการส่งเสริมสมรรถนะแห่งตน
และการสนับสนุนของครอบครัวแบบบูรณาการ

APPENDIX H

Diary

แบบบันทึก
สำหรับ
ผู้ป่วยกล้ามเนื้อหัวใจตาย

วัตถุประสงค์ของการบันทึก

แบบบันทึกนี้ใช้เพื่อให้ผู้ป่วยโรคกล้ามเนื้อหัวใจตายได้เขียนเป้าหมายและแผนปฏิบัติตัวที่เกี่ยวข้องกับการเดินออกกำลังกายและทำกิจกรรมประจำวัน และใช้สำหรับบันทึก กำกับติดตาม และประเมินผลการเดินออกกำลังกายและทำกิจกรรมประจำวันในโปรแกรมการส่งเสริมสมรรถนะแห่งตนและการสนับสนุนของครอบครัวแบบบูรณาการ สำหรับผู้ป่วยโรคกล้ามเนื้อหัวใจตาย

APPENDIX I

Assumption Test

Normality Testing

Experimental group

Descriptive

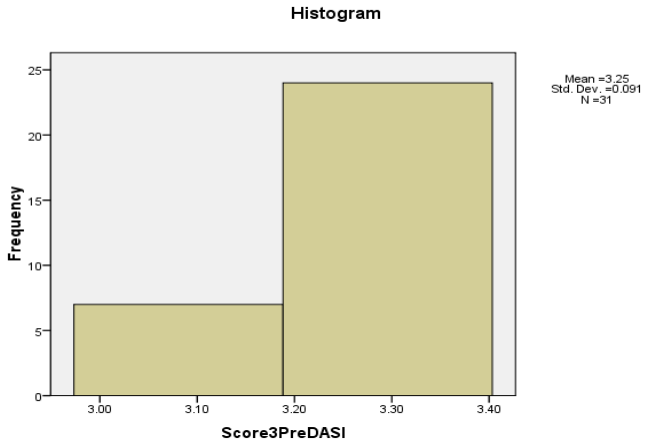
			Statistic	Std. Error
Score3PreDASI	Mean		3.2472	.01641
	95% Confidence Interval for Mean	Lower Bound	3.2136	
		Upper Bound	3.2807	
	5% Trimmed Mean		3.2537	
	Median		3.2957	
	Variance		.008	
	Std. Deviation		.09138	
	Minimum		3.08	
	Maximum		3.30	
	Range		.22	
	Interquartile Range		.00	
	Skewness		-1.379	.421
	Kurtosis		-.109	.821
Score3PostDASI	Mean		6.2570	.11927
	95% Confidence Interval for Mean	Lower Bound	6.0134	
		Upper Bound	6.5005	
	5% Trimmed Mean		6.2086	
	Median		6.3610	
	Variance		.441	
	Std. Deviation		.66406	
	Minimum		5.62	
	Maximum		7.99	
	Range		2.36	
	Interquartile Range		.98	
	Skewness		.813	.421
	Kurtosis		.011	.821

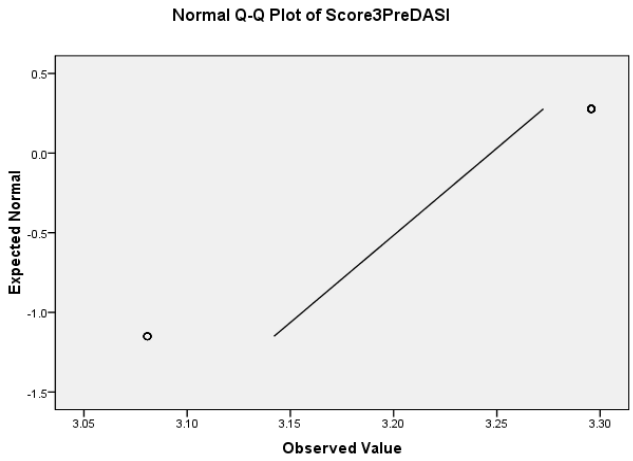
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score3PreDASI	.477	31	.000	.519	31	.000
Score3PostDASI	.249	31	.000	.835	31	.000

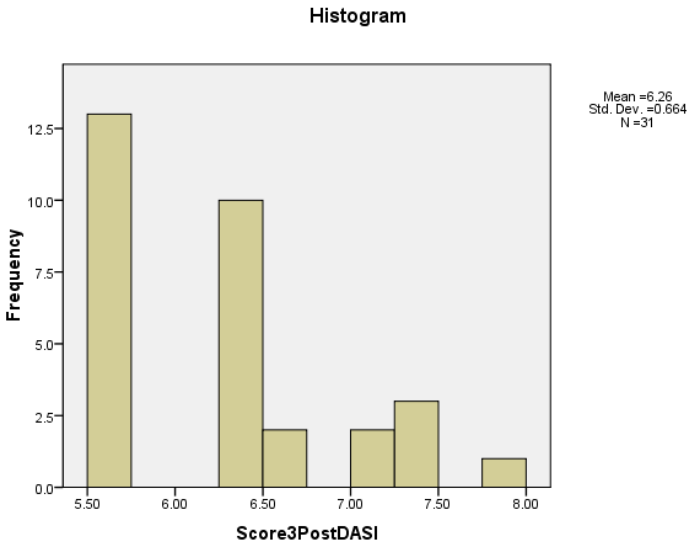
a. Lilliefors Significance Correction

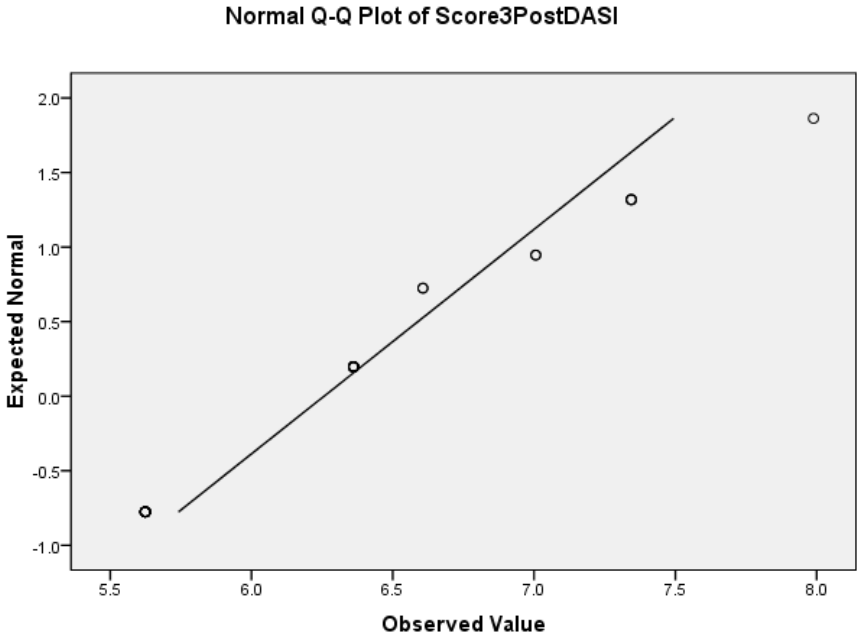
Experimental group: Pretest





Experimental group: Posttest





Control group

Descriptive

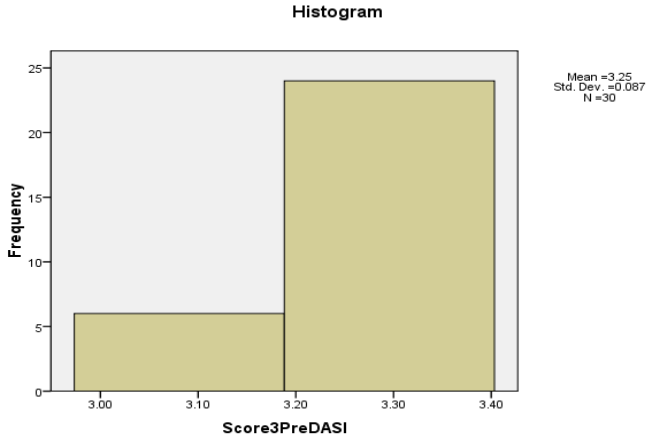
			Statistic	Std. Error
Score3PreDASI	Mean		3.2527	.01597
	95% Confidence Interval for Mean	Lower Bound	3.2201	
		Upper Bound	3.2854	
	5% Trimmed Mean		3.2599	
	Median		3.2957	
	Variance		.008	
	Std. Deviation		.08747	
	Minimum		3.08	
	Maximum		3.30	
	Range		.22	
	Interquartile Range		.00	
	Skewness		-1.580	.427
	Kurtosis		.527	.833
Score3PostDASI	Mean		4.3986	.11228
	95% Confidence Interval for Mean	Lower Bound	4.1689	
		Upper Bound	4.6282	
	5% Trimmed Mean		4.3733	
	Median		4.3031	
	Variance		.378	
	Std. Deviation		.61499	
	Minimum		3.63	
	Maximum		5.62	
	Range		2.00	
	Interquartile Range		1.11	
	Skewness		.398	.427
	Kurtosis		-1.004	.833

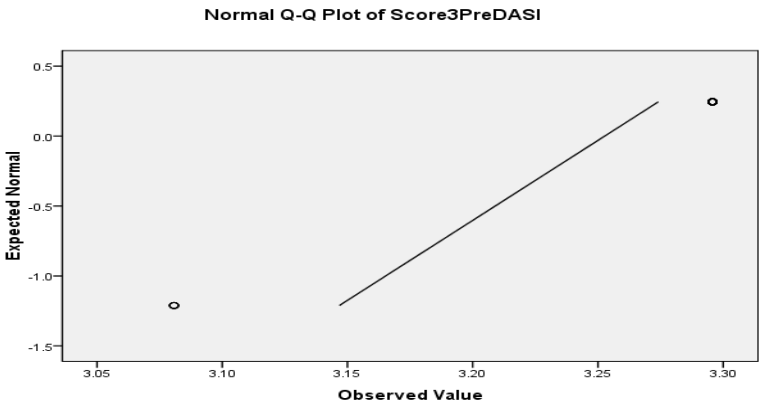
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Score3PreDASI	.488	30	.000	.492	30	.000
Score3PostDASI	.259	30	.000	.883	30	.003

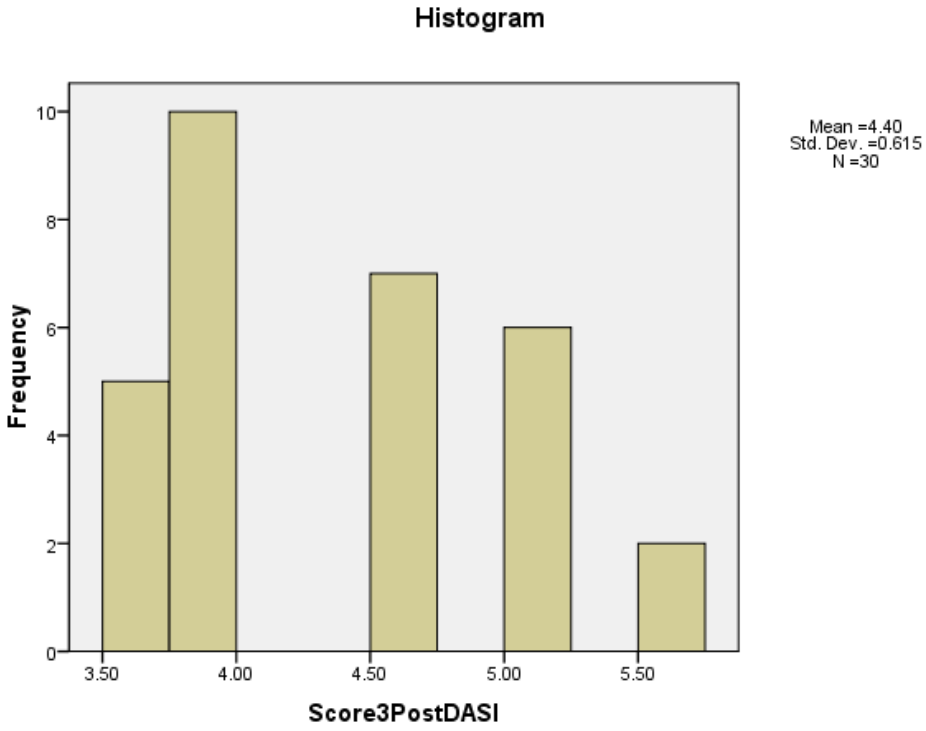
a. Lilliefors Significance Correction

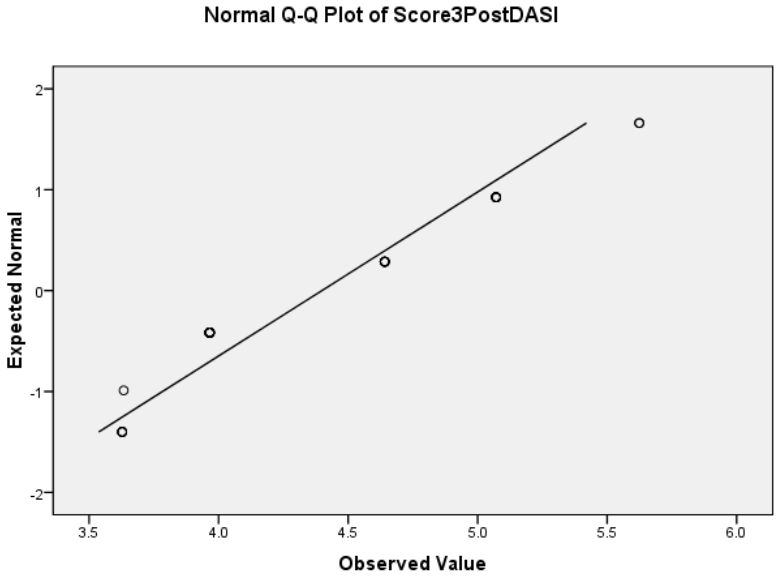
Control group: Pretest





Control group: Posttest





Experimental group: Posttest-Pretest

Descriptive

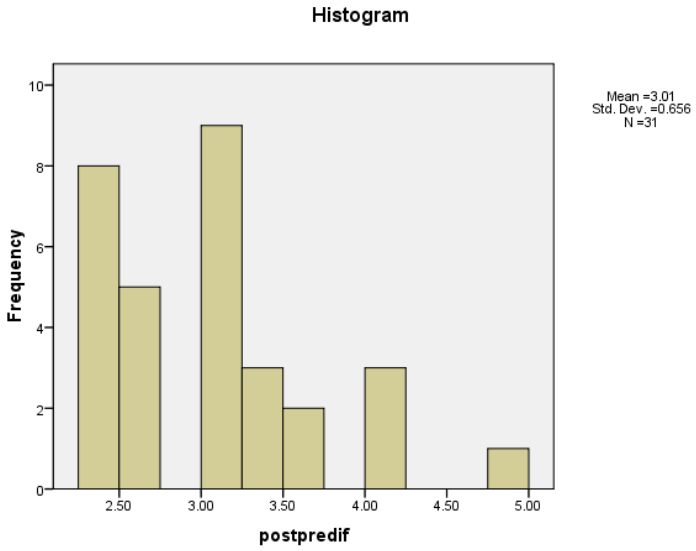
			Statistic	Std. Error
postpredif	Mean		3.0098	.11781
	95% Confidence Interval for Mean	Lower Bound	2.7692	
		Upper Bound	3.2504	
	5% Trimmed Mean		2.9592	
	Median		3.0653	
	Variance		.430	
	Std. Deviation		.65595	
	Minimum		2.33	
	Maximum		4.91	
	Range		2.58	
	Interquartile Range		.98	
	Skewness		1.000	.421
	Kurtosis		.841	.821

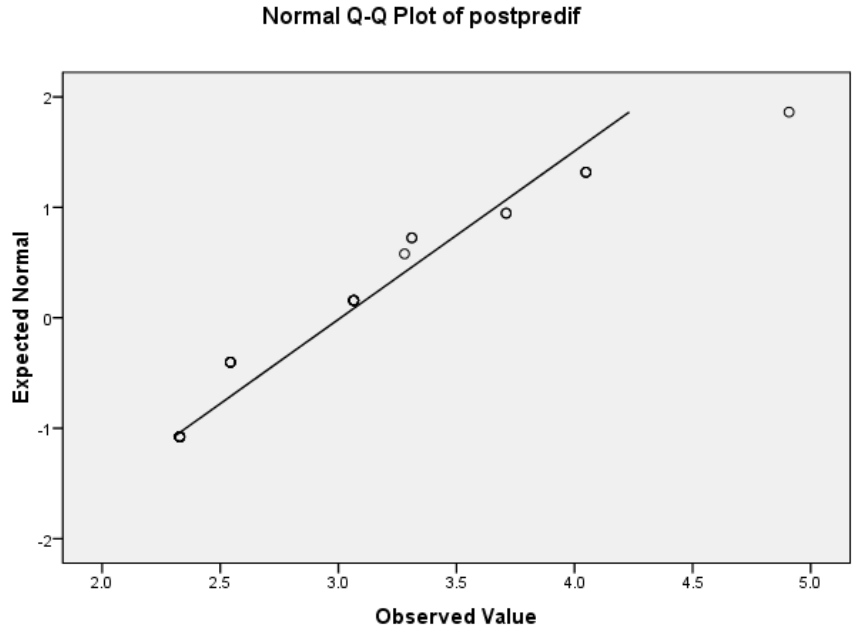
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
postpredif	.181	31	.011	.872	31	.002

a. Lilliefors Significance Correction

Experimental group





Control group: Posttest-Pretest

Descriptive

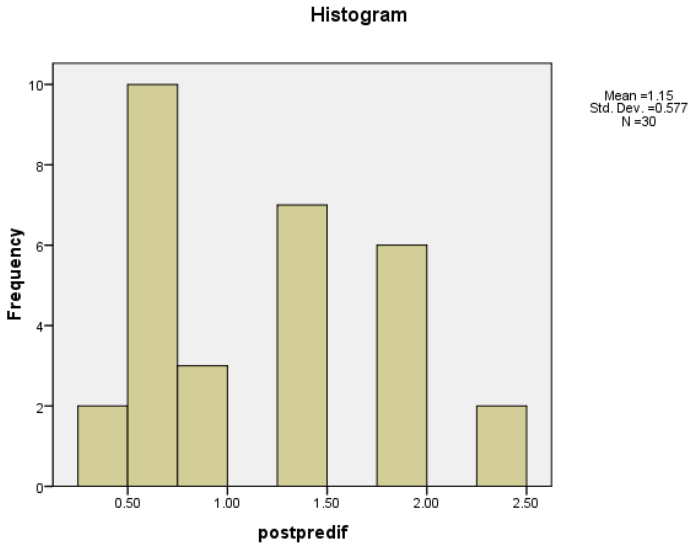
			Statistic	Std. Error
postpredif	Mean		1.1458	.10526
	95% Confidence Interval for Mean	Lower Bound	.9306	
		Upper Bound	1.3611	
	5% Trimmed Mean		1.1254	
	Median		1.1149	
	Variance		.332	
	Std. Deviation		.57653	
	Minimum		.33	
	Maximum		2.33	
	Range		2.00	
	Interquartile Range		1.11	
	Skewness		.449	.427
	Kurtosis		-.844	.833

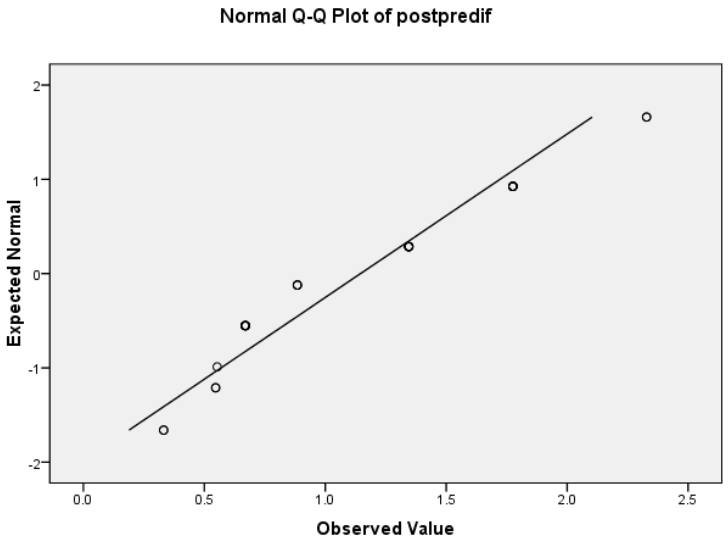
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
postpredif	.196	30	.005	.907	30	.012

a. Lilliefors Significance Correction

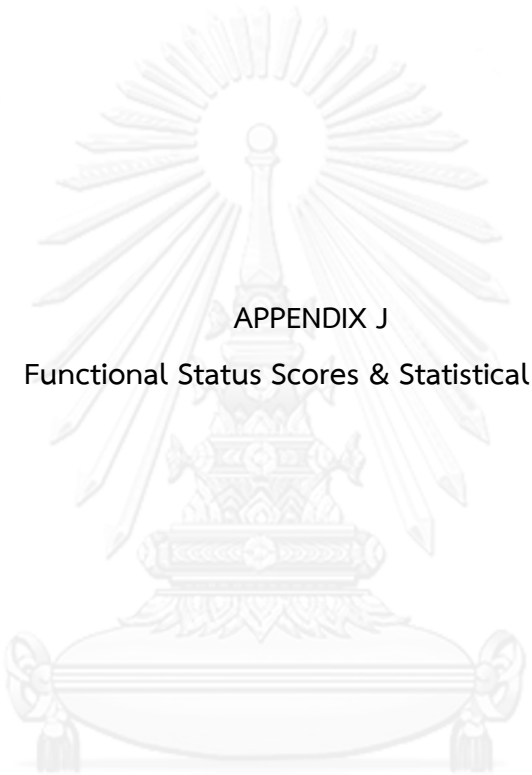
Control group: Posttest-Pretest





APPENDIX J

Functional Status Scores & Statistical Test



FUNCTIONAL STATUS SCORES

Group	Case	Functional status scores: Pretest		Functional status scores: Posttest	
		DASI-T sum scores	DASI-T METs scores	DASI-T sum scores	DASI-T METs scores
Experimental Group	1	4.50	3.30	37.45	7.34
	2	4.50	3.30	29.45	6.36
	3	4.50	3.30	29.45	6.36
	4	4.50	3.30	37.45	7.34
	5	4.50	3.30	23.45	5.62
	6	2.75	3.08	23.45	5.62
	7	2.75	3.08	23.45	5.62
	8	2.75	3.08	42.7	7.99
	9	4.50	3.30	23.45	5.62
	10	4.50	3.30	29.45	6.36
	11	4.50	3.30	29.45	6.36
	12	4.50	3.30	29.45	6.36
	13	2.75	3.08	29.45	6.36
	14	4.50	3.30	31.45	6.61
	15	4.50	3.30	23.45	5.62
	16	4.50	3.30	23.45	5.62
	17	4.50	3.30	31.45	6.61
	18	4.50	3.30	23.45	5.62
	19	2.75	3.08	23.45	5.62
	20	4.50	3.30	23.45	5.62
	21	4.50	3.30	29.45	6.36
	22	4.50	3.30	23.45	5.62
	23	4.50	3.30	29.45	6.36
	24	4.50	3.30	29.45	6.36
	25	4.50	3.30	23.45	5.62
	26	4.50	3.30	34.7	7.00
	27	4.50	3.30	29.45	6.36
	28	4.50	3.30	34.7	7.01
	29	2.75	3.08	23.45	5.62
	30	4.50	3.30	37.45	7.34
	31	2.75	3.08	23.45	5.62

FUNCTIONAL STATUS SCORES

Group	Case	Functional status scores: Pretest		Functional status scores: Posttest	
		DASI-T sum scores	DASI-T METs Scores	DASI-T sum scores	DASI-T METs Scores
Control group	1	2.75	3.08	7.20	3.63
	2	2.75	3.08	7.25	3.63
	3	4.50	3.30	18.95	5.07
	4	4.50	3.30	7.20	3.63
	5	4.50	3.30	15.45	4.64
	6	4.50	3.30	18.95	5.07
	7	4.50	3.30	18.95	5.07
	8	4.50	3.30	9.95	3.97
	9	4.50	3.30	9.95	3.97
	10	4.50	3.30	18.95	5.07
	11	4.50	3.30	7.20	3.63
	12	2.75	3.08	9.95	3.97
	13	4.50	3.30	9.95	3.97
	14	4.50	3.30	15.45	4.64
	15	4.50	3.30	15.45	4.64
	16	4.50	3.30	9.95	3.97
	17	2.75	3.08	9.95	3.97
	18	4.50	3.30	15.45	4.64
	19	4.50	3.30	23.45	5.62
	20	2.75	3.08	9.95	3.97
	21	4.50	3.30	15.45	4.64
	22	4.50	3.30	9.95	3.97
	23	4.50	3.30	18.95	5.07
	24	4.50	3.30	9.95	3.97
	25	4.50	3.30	18.95	5.07
	26	4.50	3.30	15.45	4.64
	27	4.50	3.30	9.95	3.97
	28	2.75	3.08	7.20	3.63
	39	4.50	3.30	15.45	4.64
	30	4.50	3.30	23.45	5.62

Independent *t*-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Score3PreDASI	Equal variances assumed	.235	.629	-.242	59	.810	-.00555	.02292	-.05140	.04031
	Equal variances not assumed			-.242	58.994	.809	-.00555	.02290	-.05137	.04027
Score3PostDASI	Equal variances assumed	.029	.866	11.331	59	.000	1.85841	.16401	1.53021	2.18660
	Equal variances not assumed			11.345	58.889	.000	1.85841	.16381	1.53062	2.18619

Paired *t*-test

Experimental group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Score3PostDASI	6.2570	31	.66406	.11927
	Score3PreDASI	3.2472	31	.09138	.01641

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Score3PostDASI & Score3PreDASI	31	.157	.399

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Score3PostDASI - Score3PreDASI	3.00980	.65595	.11781	2.76920	3.25040	25.548	30	.000

Paired *t* test

Control group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Score3PostDASI	4.3986	30	.61499	.11228
	Score3PreDASI	3.2527	30	.08747	.01597

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Score3PostDASI & Score3PreDASI	30	.497	.005

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Score3PostDASI - Score3PreDASI	1.14585	.57653	.10526	.93057	1.36113	10.886	29	.000

APPENDIX K

List of Experts

List of Experts

1. Professor Somchit Hanucharurnkul, Ph.D. (Nursing)
   Department of Nursing, Faculty of Medicine, Ramathibodi Hospital,
   Mahidol University
2. Assisstant Professor Sirirat Panuthai, Ph.D. (Nursing)
   Faculty of Nursing, Chiang Mai University
3. Lecturer Sarinrut Sriprasong, Ph.D. (Nursing)
   Faculty of Nursing, Mahidol University
4. Dr. Kitiya Tiyabhuk, M.D.
   Cardiologist, Medical unit, Maha Sarakham Hospital
5. Mrs. Pinthong Rattanaphuchong
   Advanced Practitioner Nurse (Cardiovascular Nursing),
   Intensive Care Unit, Khon Kean hospital
6. Assistant Professor Kergkeart bhunpipat
   Dean of Faculty of Media Production Arts,
   Kantana Institute
7. Lecturer Munyat akarachantachote
   Mass Media Communication, Faculty of Communication Arts,
   Chulalongkorn University

List of Experts for forward or backward translators

1. Assisstant Professor Dr. Visarn Kuntaratakul, MD

   Rehabilitation Unit, Samitivej Hospital.

2. Dr. Piyanuch Rukpanich, MD.

   Perfect Heart Institute, Piyavate Hospital.

3. Lecturer Choochart Wong-Anuchit

   Ph.D. candidate at St. Louis University School of Nursing, USA.

4. Lecturer Sutthida Phongphanngam

   Ph.D. candidate at St. Louis University School of Nursing, USA.

5. Dr. Wipasiri Naraphong

   Nurse instructor at Boromrajonani College of Nursing Saraburi.

VITA

Nisakorn Vibulchai was born in 1970 at Roi-Et province. She received a Bachelor of Nursing Science from Boromrajonani College of Nursing Saprasittiprasong Ubonrajathanee in 1992. She got a Master of Nursing Science (Adult Nursing), Khon Kean University in 1998. Nisakorn had 9 years of clinical experience in acute and chronic care nursing (Emergency Department & Inpatient Department) at two community hospitals in Roi-Et province. She has been a nurse instructor in the field of Adult Nursing at Srimahasakham Nursing College, Maha sarakham province since 2001 to present. She had received the scholarship for Ph.D. study from Praboromarajchanok Institute for Health Care Workforce Development and research grant support from the 90th Anniversary of Chulalongkorn University Fund (Ratchadaphiseksomphot Endowment Fund), Graduated School, Chulalongkorn University. She had studied Philosophy Program in Nursing Science, Faculty of Nursing, Chulalongkorn University since 2009-2013. During she developed her dissertation, she conducted the study named “Validation of the Thai version of the Duke Activity Status Index (DASI-T) in patients with a previous myocardial infarction”. In this study, she got the Best Oral Presentation Award in the 9th International Nursing Conference held on October 16-17, 2013, Seoul, Korea.