VALIDATION OF QUESTIONNAIRES FOR EXERCISE RESEARCH AMONG THAI MIDDLE-AGED AND OLDER ADULTS WITH CORONARY ARTERY DISEASE

By

Napaporn Wanitkun

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APPROVED:

[redacted]

Linda Felver, Ph.D., R.N., Associate Professor,

School of Nursing, Oregon Health & Science University

Research Advisor

[redacted]

Nancy A. Perrin, Ph.D., Professor,

School of Nursing, Oregon Health & Science University,

Committee Member

[redacted]

Carol Burckhardt, Ph.D., R.N., Professor,

School of Nursing, Oregon Health & Science University,

Committee Member

[redacted]

Kathleen Potempa, D.N.Sc., R.N., F.A.A.N., Dean,

School of Nursing, Oregon Health & Science University,

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ABSTRACT

TITLE: Validation of Questionnaires for Exercise Research Among Thai Middle-Aged and Older Adults with Coronary Artery Disease

AUTHOR: Napaporn Wanitkun

APPROVED: [redacted]

Linda Felver, Ph.D., R.N.

The overall purpose of this dissertation was to adapt and validate instruments for evaluating physical activity and its psychosocial influencing factors among Thai middle aged and older adults in Thailand with Coronary Artery Disease (CAD) using the Transtheoretical model (Prochaska & DiClemente, 1983) and Social Influence concept. The questionnaires included the Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults (CHAMPS), Exercise Stages of Change (ESC), Decisional Balance for Exercise (DBE), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Processes of Change for Exercise (PCE), and Social Influences on Exercise (SIE). The measures were modifications of the existing Western measures with the addition of some pertinent items from the literature, clinical experience, and personal interviews with Thai older adults. All questionnaires were translated into the Thai language by using a back-translation process (Brislin, 1970).

The aims of this study were to 1) evaluate the content validity, clarity, and cultural appropriateness of the six measures from seven Thai experts and four focus groups (two exercise groups and two non-exercise groups) of Thai middle-aged and older adults with CAD, 2) evaluate the psychometric properties of the six measures in a large

sample of Thai middle-aged and older adults with CAD, and 3) determine standardized mean differences of the scale scores of the five final measures across Exercise Stages of Change. The psychometric properties included internal-consistency reliability, item difficulty, item discrimination, construct validity, and concurrent validity. This study had two phases. Phase I, Content Validity Evaluation Phase, addressed aim 1. Phase II, Psychometric Property Evaluation Phase, addressed aims 2 and 3.

This study recruited Thai middle-aged and older adults with CAD who had no physical function limitation, from two hospitals; Ramathibodi Hospital and Central Chest Institute. The sample in Phase I consisted of seven Thai experts in research and clinical practice and four focus groups of nine participants in each group, total of 36 participants. Content validity of all items was confirmed by the experts. No items were deleted based on findings of Phase I but some language revision was done in order to increase comprehensibility and appropriateness of language for the Thai population. This did not change meaning of the items.

In Phase II, there were 412 participants aged 45- 81 years old with a mean and standard deviation of 62.04 $\pm$ 8.59 years. The majority of participants were male (83.7%), married/cohabitant (86.2%), had education lower than college level (59%), and had enough income with some financial saving (42%). There were no significant differences between two hospital populations on education, income, and number of chronic illness, but the mean difference of age was significant at $p < .05$.

The distribution of participants across the Exercise Stages of Change was: Precontemplation (10.5%), Contemplation (14.8%), Preparation (19.7%), Action

(21.4%), and Maintenance (33.6%). The highest percentage of participation in physical activities for this sample was activities related to housework (82.3%). However, for physical activity of at least moderate intensity level, 57.3% of participants did fast or brisk walking for exercise. The construct validity of the modified CHAMPS questionnaire was confirmed by significant mean differences of caloric expenditure across the stages. For concurrent validity, correlations between the SF-36 and caloric expenditure for all physical activities and at least moderate intensity level physical activity as estimated by the modified CHAMPS questionnaire were low but significant. Thus, these variables were consistently correlated to one another but the correlations were small in magnitude.

The item analysis findings showed that all scales had good internal reliability, item variability and item discrimination between participants with low scores and those with high scores on each scale. This held true except for the four negative aspects related to exercise, which included the Cons scale of Decisional Balance for Exercise and three Negative Behavior scales of Social Influence for Exercise. These four scales were not included in final measures because of low internal-consistency reliability, poor variability, and poor discrimination. These findings may be explained by the high value placed on harmony and group cohesiveness in Thai culture and an unwillingness to identify negative aspects of exercise, since the benefits to health are well-established. The six final measures demonstrated good internal-consistency reliability. There was evidence of construct validity based on confirmatory factor analysis on the six final measures. Each item loaded well on its expected factor and had acceptable variance explained by its

related factor. The fit of each construct model and the data was acceptable as indicated by goodness of fit indexes.

Analysis of variance and follow-up tests of Bonferroni adjustment of the alpha were used to examine construct validity of the staging algorithm. All ANOVA tests were significant and the staging algorithm showed good sensitivity to detect difference in reported scores of other final measures in this study. The majority of differences in magnitude across the staging algorithm showed by effect sizes of mean difference were small to large.

Preliminary evidence was found for the applicability of the Transtheoretical model to Thai middle-aged and older adults with CAD related to physical activity and exercise, with the exception of the negative aspects related to exercise. The findings suggest that the final underlying constructs of these measures can be applied in the future research as outcome measures. Moreover, the magnitude of mean differences across the stages suggests that these instruments may be used in future intervention studies to assess invention effectiveness.

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CHAPTER 1: INTRODUCTION

Cardiovascular disease is the greatest cause of mortality across many countries (Pearson, Bales, Blair, & et al., 1998). With the health technology at this time, people can get a variety of sophisticated and expensive treatments to improve their cardiovascular functions. However, within a short period after treatment many of them will develop repeated symptoms of Coronary Artery Disease (CAD) if they do not change their lifestyle. This problem is recognized by national health care systems in most countries, and Thailand is no exception. The World Health Organization has classified physical inactivity as a primary risk factor of CAD (Bijnen, Caspersen, & Mosterd, 1994). Many studies demonstrated that regular exercise reduced the risks of CAD, stroke, and cardiovascular mortality in middle and older age (Wannamethee & Shaper, 2001). The discovery of effective interventions to promote exercise has become a significant focus in health promotion research for the population.

The Transtheoretical Model of Behavioral Change (TTM) developed by Prochaska and DiClemente (1983) has been applied successfully in behavior change interventions in the United States, including exercise. Available data reported the application of TTM to promote AIDS preventive behavior, and smoking cessation in Thailand (Jaruchovarit, 1995; Narkarat, 1997). TTM, by principle, may also be applied in the area of exercise in the Thai context. There is a lack of studies to promote exercise using this framework and a lack of validated instruments in Thai; therefore, the first step in determining the usefulness of TTM in exercise behavior is to test the reliability and validity of the adapted scales.

The overall purpose of this study was to adapt and validate instruments for evaluating psychosocial factors influencing exercise among the middle aged and older adults with Coronary Artery Disease (CAD) using the Transtheoretical model (Prochaska & DiClemente, 1983). The instruments include the Community Healthy Activities Model Program for Seniors (CHAMPS) (Stewart et al., 2001), Decisional Balance for Exercise (Nigg, Rossi, Norman, & Benisovich, 1998), Self-efficacy for Overcoming Barriers to Exercise (Benisovich, Rossi, Norman, & Nigg, 1998), Processes of Change for Exercise (Nigg, Norman, Rossi, & Benisovich, 1999), Positive and Negative Social Influence for Exercise (Chogahara, 1999), and Stages of Change for Exercise (Marcus, Selby, Niaura, & Rossi, 1992c).

This study included two phases: Content Validity Evaluation Phase and Psychometric Property Evaluation Phase. The first phase addressed aim 1 and the second phase addressed aim 2 and aim 3. The goal of the study was to end up with a set of validated instruments that could be used as assessment and outcome measures in exercise research and exercise program in Thailand. The specific aims of the study were:

Aim 1: To evaluate the content validity, clarity, and cultural appropriateness of all instruments in small groups of Thai middle-aged and older adults with coronary artery disease.

Aim 2: To evaluate the psychometric properties of the six measures in a large sample of Thai middle-aged and older adults with coronary artery disease. The psychometric properties included internal-consistency reliability, item analysis, construct validity, and concurrent validity.

Aim 3: To determine standardized mean differences of the scale scores of the five final measures across Exercise Stages of Change.

CHAPTER 2: REVIEW OF THE LITERATURE

Background & Significance

The number of elders in Thailand is projected to rise dramatically. From 1990 to 2020, older adults age 60 years and older will almost triple (from 4.02 million to 10.78 million) while the total population will increase by approximately one third (The Ministry of Public Health, 1993). Thai elders who are aged 60 years and older were only 7.36 percent of the total population in 1990 but they will represent 15.28 percent by the year 2020 (Human Resources Planning Division, 1995). The life expectancy of today's Thais has been reported as being much longer than those in the past. Between 1985 and 2000, life expectancy rose from 62.24 to 67.36 years for males and from 66.19 to 71.74 years for females (Human Resources Planning Division, 1995). This population forms a challenging new target population requiring refined health care strategies from the Thai medical community to cope with the expected health needs.

Advances in health care technology have resulted in more effective treatments and more survivors with chronic illness. Inevitably, chronic illnesses have become significant health problems among Thai older adults. Age-specific mortality rates of diseases in Thai elders ranked as follows: cardiovascular diseases especially coronary heart disease, malignancy, cerebrovascular diseases, septicemia, and diabetes mellitus (The Ministry of Public Health, 1993). These chronic illnesses are remarkable among Thai elders who live in the urban areas. According to the national Survey of the (Human Resources Planning Division, 1995), Thai urban elders had higher prevalence of chronic diseases than rural elders did. These included hypertension, osteoarthritis, heart disease,

diabetes mellitus, and paralysis mainly as a result of stroke. A relationship has been demonstrated between these diseases and a physically inactive lifestyle.

Coronary Artery Disease (CAD)

Coronary artery disease is a leading cause of morbidity and mortality among the Thai older population. In addition, CAD is an important cause of disability among this population. CAD is an acquired heart disease resulting from narrowing or blockage of the coronary arteries. Well-recognized major risk factors for developing CAD include high blood pressure, abnormal blood lipids, diabetes mellitus, cigarette smoking, obesity, and physical inactivity. Some of these major risk factors are modifiable. The important issue of physical inactivity will be discussed in detail later. The narrowing of coronary arteries in CAD results from the process of atherosclerosis. This is a complex biological interaction of inflammation and cholesterol plaque building up in the walls of arteries. When the plaque tears or ruptures, blood clots form that may block the arteries. During exertion, the heart muscle increases the demand for oxygen and nutrients but the narrow coronary arteries cannot provide sufficient supply. The ischemic heart muscles cannot work at optimal capacity. They shift to anaerobic metabolism, which results in accumulation of lactic acid and other metabolites and produces symptoms of angina (chest discomfort or pain) or myocardial infarction (chest discomfort, chest pain, or even sudden death).

Physical Activity

Definition and Measurement

Physical activity is defined conceptually as "bodily movement produced by skeletal muscle contraction that increases energy expenditure above the basal metabolic rate" (Caspersen, Powell, & Christenson, 1985). The National Institutes of Health (U.S.Department of Health and Human Services, 1996) also defines physical activity as any "bodily movement produced by skeletal muscles that requires energy expenditure and produces progressive health benefits". Any bodily movement produced by diseases such as Parkinson's diseases or activities such as watching television are excluded by this definition. The definitions of physical activity and exercise have had some variations in the existing literature. Exercise is a subset of physical activity that is planned, structured, repetitive, and purposeful in the sense that improvement or maintenance of physical fitness is the objective. Physical fitness is a set of attributes that people have or achieve and relates to their ability to perform physical activity (Pate et al., 1995). Some researchers use the concepts of physical activity and exercise interchangeably. In this study, the definitions of these terms followed Caspersen's definition (1985, p.185).

Physical activity is operationally described as activities of daily living (e.g., bathing, feeding, and grooming), instrumental activities of daily living (e.g., transportation, shopping, and housekeeping), leisure activities (e.g., sports, conditioning exercise, and household tasks like gardening or yard work), and occupational activities. There are varieties of methods available to measure physical activity. Actual physical activity can be assessed by self-report, behavioral observation, electronic monitors,

physiological markers such as heart rate or oxygen consumption, and calorimetry (LaPorte, Montoye, & Caspersen, 1985). The objective measures, such as calorimeter, behavioral observation, or electronic monitors, are precise, valid, and reliable but impractical and expensive in population-based research (LaPorte et al., 1985).

Self-report measures of physical activity have been widely used in survey studies (Brownson et al., 2000; Eyler et al., 1999), and intervention studies (Allison & Keller, 2000; Dunn et al., 1997). The term self-report measure means that the instruments are self-administered or interviewer-administered recall questionnaires, activity logs or diaries, or proxy reports. Physical activity can be measured in terms of type, intensity, duration, and frequency over a defined time period. Previous studies in patients with coronary artery disease assessed physical activity from recall at different periods. The timing varied from the past 2 weeks (Arraiz, Wigle, & Mao, 1992; Lacroix, Leveille, Hecht, Grothaus, & Wagner, 1996) to the past year (Leon, Connett, Jacobs, Jr., & Rauramaa, 1987; Sherman, Agostino, Cobb, & Kannel, 1994). Some studies assessed usual activities (Hein, Suadicani, & Gyntelberg, 1992; Rodriguez et al., 1994; Sherman et al., 1994).

Sallis and Saelens (2000) stated that self-report might not be appropriate for studies focusing on the absolute amount of physical activity, because overestimation of physical activity on self-reports was frequently found. Hayden, Sallis, Armstrong, Whalen, and Sarkin (1998) demonstrated that self-report physical activity had different estimations compared with the accelerometer monitoring. These include overestimation by 100% for recalled vigorous physical activities and underestimation by 35% for

moderate intensity of physical activities. However, the total minutes of physical activity were almost identical with the values from accelerometer monitoring. Selection of self-report questionnaires to estimate levels of physical activity should be carefully done.

The items in a physical activity self-report questionnaire should clearly state the type of activity instead of a complexity of activities such as moderate level of activities (Stewart et al., 2001). Several items are necessary for assessing multiple activities. The procedure, rationale, and psychometric evaluation should be described as a guideline for measurement selection. In addition, Warnecke et al. (1997) suggested when a questionnaire is used in a different population, the meaning of the item may not be the same. Therefore, the meaning of the item should be investigated. There were a limited number of studies on the types of physical activities among Thai middle aged and older adults with coronary artery disease. It was important for this study to validate an instrument to assess the type, intensity, and duration of physical activity in this population.

The information from a self-report questionnaire is calculated to reflect the rate of energy expenditure during physical activity. Physical activity levels are generally expressed in METS (where 1 MET = an energy expenditure of 3.5 $kcal \cdot kg^{-1} \cdot min^{-1}$). According to recommendations of the U.S. Department of Health and Human Services, people should engage in physical activity of at least moderate intensity to achieve health benefits. Moderate intensity physical activity is defined as activity of greater than 3 METS. There have been few studies conducted using this recommendation in Thailand. There is limited research in the Thai population in which this recommendation has been

applied. A literature review of articles from 1990-1999 demonstrated that exercise self-report is needed to assess frequency, intensity, and duration of physical activity to define the dose-response association between physical activity and health outcomes (Sallis & Saelens, 2000).

Physical Activity and Coronary Artery Disease

Physical inactivity as a risk factor for CAD.

The World Health Organization acknowledged physical inactivity as one of the primary risk factors for CAD (Bijnen et al., 1994). In addition, a meta-analysis found that the relative risk of death due to CAD was almost two-fold higher for sedentary subjects (Berlin & Colditz, 1990). On the other hand, there is strong evidence that physical activity is effective in reducing risk factors for CAD. There is an inverse relationship between physical activity and blood pressure. A reviewed study demonstrated reductions of both systolic and diastolic blood pressure in approximately 75% of patients with hypertension after exercise training (Hagberg, Park, & Brown, 2000). Regular physical activity is also beneficial in the management of type 2 diabetes mellitus. Research demonstrated a decrease in blood glucose and an increase in insulin sensitivity for up to 72 hours into the post-exercise period {Albright, 2000). Recent epidemiological evidence suggests that the health risks of obesity are largely controlled in physically active and fit persons (Welk & Blair, 2000). Physical activity also has favorable effects on several aspects of the blood lipid profile (Stefanick & Wood, 1994).

Prevalence of physical inactivity in Thai adults.

As a result of the rapid growth and spread of industrialization and westernization, sedentary lifestyle and physical inactivity among Thai elders in urban areas are increasing. Several studies demonstrated that Thai older adults have low levels of exercise (Inpang, 1999). A recent study showed that physical inactivity was the most prevalent risk factor for CAD at 71.8% in Thai urban older adults (Pothiban, 1993). This mandates attention to identify modification of coronary risk factors in this population. In addition, the rate of disability among Thai elders rose from 7% in 1982 to 11 % in 1994. A study conducted among elders in Klong Toey Slum, a poor urban area, reported that 1.6 % of elders were moderately severely or severely disabled (Jitapunkul, Kamolratanakul, Chandraprasert, & Bunnag, 1994). If this percentage is applied to the general population, by the year 2003 there would be 5,457,000 disabled elders. This will put a remarkable strain on both health and social services.

Benefits of increasing physical activity in persons with CAD.

The benefits that result from exercise participation among patients with coronary artery disease have been well documented (Wenger et al., 1995). In particular, reduced myocardial oxygen demands at sub-maximal workloads with associated lessening of the occurrence and severity of symptoms associated with activity, and decreases in cardiovascular mortality are the primary benefits of exercise participation. Besides, exercise participation is also related to modification of other risk factors, including lowering the levels of cholesterol and blood pressure and improvement in appropriate body weight status, mood, and social function (Lavie & Milani, 1995).

A 24% reduction in cardiovascular mortality was found in subjects whose energy expenditure was greater than 2000 kcal/week in studies of male college alumni (Paffenbarger, Jr., Hyde, Wing, & Hsieh, 1986). In addition, regular moderate intensity activity (METs >3) can result in cardiovascular risk reduction (Bijnen et al., 1998; Haapanen, Miilunpalo, Vuori, Oja, & Pasanen, 1997). Questions remain regarding what types of physical activities would both benefit a persons' health and be consistent with their beliefs. It is important to assess the types of activities that the Thai CAD population does to find appropriate types of activities for future intervention studies. Many studies have demonstrated types of physical activity of older adults, for example: walking, household activity, and caretaking of children. However, types of activities among CAD patients in Thailand are still understudied.

There are a number of physiological benefits of regular physical activity. These include improvement in myocardial contraction and its electrical stability, increase in stroke volume, and decrease in heart rate at rest. Endothelial function is improved, leading to better flow-mediated dilatation. The physiological effects result in increased exercise tolerance, reduction in blood pressure, and reduction of body weight. Regular physical activity also has effects on the tendency of blood to clot. Changes include reduced platelet aggregation and increased fibrinolytic activity. Furthermore, physical activity lowers inflammatory factors such as C-reactive protein, white blood cell count, and plasma fibrinogen. The metabolic benefits include reduction in low density lipoprotein cholesterol (LDL-C) and total cholesterol, increase in high density lipoprotein

cholesterol (HDL-C), and increase in insulin sensitivity. The overall benefits of regular physical activity modify many of the risk factors of CAD.

A growing body of evidence supports the benefits of physical activity to health of those with existing CAD, and for primary and secondary prevention of CAD in all age groups. The British Regional Heart Study demonstrated that light-to-moderate activity is associated with a significantly lower risk of all-cause mortality over the 5-year follow-up (Wannamethee, Shaper, & Walker, 2000). Physical activity can serve as a primary prevention for CAD. Manson et al. (1999) demonstrated that brisk walking in middle-age women resulted in age-adjusted relative risk for coronary events in a range of 0.46-0.77. Lee, Nigg, DiClemente, and Courneya (2001) conducted a prospective study in 39,372 women and demonstrated that with more vigorous walking, lower risks of coronary artery disease were found. Risk reduction depended upon the distance not the pace.

Adherence to Physical Activity

Adherence to regular physical activity is problematic for the majority of individuals. They are more likely to participate in one providing the most benefit for the least amount of work. It is important to determine which activities are enjoyable and have minimal potential for injury. There are a number of choices individuals can choose, including lifestyle activities such as walking, housework, gardening; scheduled leisure time activities such as golf, swimming, dancing; occupational or vocational activities; and household chores (Keller, Fleury, & Mujezinovic-Womack, 2003).

Wongkaoom (1997) demonstrated that the Thai urban elderly had high knowledge and a positive attitude toward exercise, but had low exercise participation rates. People

are aware that they should exercise more frequently to get its benefits. However, traditional programs of exercise promotion that do not consider a personalized approach may not succeed. Instead of reliance on preferred exertion, many exercise interventions prescribed a given exercise intensity based on scientific knowledge. What common types of exercise the Thai CAD population engages in appears to be understudied. Many Thai older adults are not likely to exercise due to the social perception that exercise is a youthful endeavor that lacks appropriateness for them. Having knowledge and a positive attitude toward exercise alone are not enough to motivate people to participate in exercise.

Even with an understanding of the benefits of exercise, people may not integrate exercise into their daily life. Among older adults with heart disease, there is great concern about the risk of falling and chest pain while doing vigorous activities (Mahanonda et al., 2000). A study found that perceived barriers were the strongest influencing factors to exercise among Thai patients with Coronary Artery Disease (Jitsacorn, 2000). Studies of factors influencing exercise in the Thai population have not explored the relationship of these factors. The individual differences of perceived benefits and barriers to exercise are understudied. Balancing benefits and barriers may affect peoples' decision-making to change their individual exercise behavior. In addition, studies of separate concepts may not accurately represent the decision-making process that people use. Further study exploring factors influencing physical activity that weights the importance between exercise pros and cons in predicting exercise behaviors is needed for understanding exercise behavior.

Physical Activity and Personal Characteristics

Age.

Most studies found significant effects of age on physical activity. Only one study found a non-significant effect (Conn, 1998). Age was found to be significant as both a direct and indirect effect on physical activity. The direct effect means that older persons are either less active in overall activities or in some specific types of physical activity (Allison, 1996; Armstrong & Morgan, 1998; Bennett, 1998; Booth, Owen, Bauman, Clavisi, & Leslie, 2000; Burton, Shapiro, & German, 1999; Castaneda, Bigatti, & Cronan, 1998; Clark, 1999; Conn, 1998; Dallosso et al., 1988; Galgali, Norton, & Campbell, 1998; Hays & Clark, 1999; Resnick, Palmer, Jenkins, & Spellbring, 2000; Scharff, Homan, Kreuter, & Brennan, 1999; Wilcox, Castro, King, Housemann, & Brownson, 2000).

Among older adults with specific chronic diseases such as diabetes, age was also a significant factor influencing physical activity. Hays and Clark (1999) found older adults with type 2 Diabetes aged 70 and older had a significantly less amount of weekly physical activity than did elders 50 to 69 years old (odd ratio = .96, $p<0.05$). The study of Galgali et al. (1998) in inactive older adults aged more than 60 years also supported the significant influence of age on physical activity. Bennett (1998) stated that activity types were different between older and younger age groups. Most of the older adults preferred to walk for exercise while the younger groups did not. Therefore, the effect of age on physical activity may be different across physical activity levels. Researchers may need to be cautious in interpreting age as a predictive factor.

Age also represents stages of human development. People with different chronological ages are at different levels of human development such as child, adolescent, adult, and elderly. Recommendations for "adequate physical activity" in each specific age group are needed. Scharff et al. (1999) found significant differences in adequate levels of physical activity among women at different ages. They measured physical activity in terms of adequate or inadequate levels of physical activity by comparing them with the Surgeon General's guidelines for recommended physical activity levels. The proportion of women reporting adequate levels of physical activity was nearly twice as high among women less than 30 years of age than for those in their sixties. However, this study used a standard recommendation across age that may be inaccurate. "Adequate physical activity" for persons aged younger than 30 years might not be the same as that for elders aged older than 60 years. This is an interesting point for justification of categorized outcome variables.

Age is also a relative concept based on how a person feels physically, mentally, and socially. Cultural effect is an important factor to consider when conducting research in the older population. Physical activity is a concept related to a person's belief about what it means to be active or inactive. Older people of the same age may not have the same level of physical activity. Airhihenbuwa et al. (1995) demonstrated that African American older adults were accepting of death and did not exercise to live longer. They exercised less because they spent a lifetime of hard work before retirement, and viewed retirement as a time to rest. Thus, exercise perspectives among older adults may vary across culture.

The indirect effects of age through other factors are significant. Age has an indirect effect on physical activity through other factors such as self-efficacy and outcome expectation (Conn, 1998; Resnick et al., 2000). Resnick et al. found that age indirectly influenced exercise behavior via outcome expectations (β=-0.13); the older adults who were younger had higher outcome expectations related to exercise than their older counter parts. In addition, Conn found indirect effects of age via self-efficacy and outcome expectation. Further study is needed to confirm the indirect pathways of age through physical activity.

Age was generally defined as a number counted cumulatively for the passing years since the person's date of birth. As people age they may have declines in mobility function and delayed neurological response. However, in a cross-sectional study, physical activity was likely to slightly increase after retirement for elders age 65 to 69 years when compared to those age 60-64 or 70 or older (Booth et al., 2000). After age 69 years, physical activity had a slightly negative correlation with age until the lowest activity level of the population was reached. This presented issues of a nonlinear relationship between age and physical activity that researchers may need to consider when selecting statistical analyses. In contrast, in an 8-year longitudinal study, the intensity of participation in leisure activities linearly declined over time (Bennett, 1998). Further study may need to identify patterns of relationship between age and physical activity before interpreting the effects of age on physical activity.

Gender.

Many studies reported significant effects of gender on physical activity. In general, older men had higher levels of physical activity than older women (Dallosso, 1988; Wolinsky, 1995; Burton, 1999; Clark, 1999; Booth, 2000). Resnick et al. (2000) studied 187 older adults living in a continuing care retirement community and found that gender did not directly influence participation in 20 minutes of continuous aerobic exercise three times a week for the previous three months. Its influence was indirectly negative through self-efficacy.

Types of activity were different between genders among older adults (Armstrong & Morgan, 1998; Bennett, 1998; Castaneda et al., 1998; Dallosso et al., 1988). Bennett (1998), and Armstrong and Morgan (1998) conducted studies using the same sample for 8 year-longitudinal studies and Dallosso et al. (1988) did a cross-sectional study with a random sample of older adults aged 65 and older. However, these studies found differences of activity types between genders. Traditional gender roles continue to be a strong influence on the level and types of physical activity. Men were likely to have more outdoor activities than women and women had more indoor activity than men. The findings should be interpreted with caution. The participants in these studies were the aging generation in 1985-1993. Present society and beliefs related to types of activities may change across time. The proportion of women who work and do leisure activities outside their homes has increased remarkably. Because of the data collection period, the goal of further study may be to understand physical activity patterns among older adults in an advanced technological society.

The study of Castaneda et al. (1998), in 196 osteoarthritis patients aged 60 years and older, found that a larger percent of women than men indicated they did not exercise while the patients who exercised had no significant difference in total kilocalories expended by men and women. The different levels of physical activity may change the effect of gender on physical activity. Bennett's study (1998) found that the overall models of physical activity were different between men and women. The women's model (22.8%) had higher variance accounted for by exercise than men's (11%). This suggested that there were other important factors related to men's exercise behaviors. Therefore, the model of physical activity differed by gender.

Two studies found non-significant differences in physical activity in general by gender (Castaneda et al., 1998; Hays & Clark, 1999). However, Castaneda's study in older adults with osteoarthritis found no significant difference of total kilocalories expended by men and women in any of the exercise behaviors. The authors suggested that older adults tend to engage in moderate exercise more than in vigorous exercise and the effects of gender on exercise tend to decrease when moderate or light exercise were considered. All of these studies categorized physical activity into dichotomous variables or categorical variables except the Castaneda study. Castaneda demonstrated no significant difference in total kilocalorie expenditure per week between men and women with osteoarthritis. The reason for treating physical activity as a dichotomous variable was the skewed distribution of physical activities. Categorizing physical activity into either active or inactive categories may have caused a loss of sensitivity and, therefore, of

predictability by gender. Researchers may need to be cautious in interpreting their findings when using a categorical variable as an outcome.

For example, some factors predicted exercise behavior in either only men or only women older adults. Extroversion was significantly related to exercise only for men while quality of well-being and helplessness were significant only for women (Bennett, 1998). Ruuskanen and Ruoppila's study (1995) also supported a difference between genders as far as factors that influenced physical activity. Among women, better self-rated health and overall meaningfulness of life were significantly associated with physical activity while men showed significant associations between better self-rated health, depression symptoms, and physical activity. These studies emphasized the significance of separate models in explaining factors that influence physical activity when gender is included.

Socioeconomic (Education and Income).

Education and income have a positive relationship to the levels of physical activity (Clark, 1995; Wolinsky, 1995; Yusuf, 1996; Conn, 1998; Burton, 1999; Hays, 1999; Wilcox, 2000). Higher income and education have correlated with a more active life style. Wilcox studied rural and urban women and found that only rural women who had lower levels of education engaged in significantly less leisure time activity. The relationship of less education to an inactive life among older adults could be explained by less resource availabilities and lower confidence. Less income and education might also be related to less time to be aware of their health. Their thoughts mainly focus on working to maintain an appropriate life. In addition, less educated persons may be less

confident in their ability to carry out a behavior. The education variable also has to be considered in relation to self-efficacy since self-efficacy is positively related to income and education among older adults (Clark, 1995).

In a study conducted among women aged 60 years or older, education was not a significant predictor of adequate physical activity (Sharff et al., 1999). Hesser and Hyun's study (1997) categorized their older participants into three groups by levels of physical activity. They found that education and income were not significant predictors for physical activity among older adults who had regular and sustained physical activity but were significant predictors for moderate and sedentary older adults. In summary, the socioeconomic factor did not offer a clear explanation of physical activity among the older population. This factor may not have direct effects on physical activity, but may influence the level through other factors such as psychological or resource availability.

Health condition factors.

Aging is a gradual process of change over the course of time. As they age, people may be confronted with chronic illness and seriously impaired physical health. This process decreases the levels of physical activity among older adults. Wolinsky, et al. (1995), in a longitudinal study in aging, and Clark (1999) in a survey of 771 older adults, reported that perceived health was a significant predictor of exercise. Scharff, et al. (1999) found two health conditions which significantly predicted physical activity: self-report of higher cholesterol level and higher perceived risk of heart attack. Conversely, other studies have found no statistically significant direct relationship between health and physical activity (Conn, 1998; Resnick et al., 2000).

Depression is a major health issue among older adults because of its incidence and its adverse health consequences. Penninx et al. (1999) compared physical activity between non-depressed and depressed older adults living in the community. They found that depressed older adults were significantly less physically active than non-depressed older adults. When people are inactive, depressive symptoms will be more severe. This is a vicious cycle. In addition, depressed older adults were more likely to be unmarried and had few close relatives and friends. These factors were related to social supports for being active. These findings support the complexity of physical activity. Researchers need to recognize the possibility that social relationships are among determinants of physical activity.

Transtheoretical Model of Behavior Change

The Transtheoretical Model (TTM) emerged from a comparative analysis of leading theories of psychotherapy and behavioral change (Prochaska & DiClemente, 1983). TTM focuses mainly on individual readiness to change and the natural dynamic tendencies of change. The TTM consists of various stages of change, processes of change, self-efficacy, and decisional balance. This theory focuses on self-changing; people progress through specific stages while they struggle to change their risk behaviors (Prochaska & Marcus, 1994, chap.6). The model relies on self-report to assess emotions, cognition, and behavior. Therefore, measurement is one of critical steps to assure that individuals can respond each item with less misrepresentation (Velicer, Prochaska, Fava, Norman, & Redding, 1998).

Earlier, the TTM has been applied in the area of smoking cessation. Marcus et al. (1992) initially demonstrated that the instruments based on the TTM construct revealed similar findings when used to study exercise behaviors. Subsequently, many researchers conducted studies to test the constructs and to study the relationship and predictability of the TTM variables to exercise. Now several exercise interventions have applied the TTM successfully (Cardinal, 1995; Herrick, Stone, & Mettler, 1997; Kohl, Dunn, Marcus, & Blair, 1998) to promote exercise in a variety of populations. Recognition of an individual's readiness to change is important in order to get people to start exercise or to maintain their exercise behavior. The strengths of the TTM are its sensitivity to degree of readiness, incremental change over time, and specific interventions across the stages.

Generally, studies found that examining researcher-generated variables account for little of the variance in exercise in Thai older adults despite the inclusion of many variables (Chinuntuya, 2001; Vannarit, 1999; Yamchanchai, 1995). Most studies focused on the direct influence of the variables on exercise (Inkoom, 1997; Ngaosornskul, 2000; Vannarit, 1999). However, it is important to understand that exercise is a dynamic behavior. People who are starting exercise and those who exercise irregularly may have different factors influencing their exercise behaviors. Researchers may need to recognize that different approaches may be required to help individuals to exercise at various stages of their readiness for exercise. No studies have explored how individual differences affect exercise behavior in Thailand.

Most Thai research has addressed exercise behavior from the static and linear perspective. Exercise behavior and its determinants can be changed over time and it is

simplistic to depict individuals as either active or sedentary by energy expenditure only. The population of interest is a heterogeneous mixture of people with different degrees of readiness to be active. The differences require different intervention strategies that account for differences in their level of intention. Performing exercise does not have a linear relationship to influencing factors. Individuals may go back and forth among the first four stages before reaching the maintenance stage. When they were in each stage, people may need different influencing factors to help them to be more active. The interactions of these factors vary in explaining a person's readiness to perform the behavior.

Moreover, behavior change is a gradual dynamic process that occurs either progressively or in a relapsing pattern. Many researchers have contributed knowledge about exercise and its benefits as a static phenomenon. Providing repeated education is not always successful and generalizing an intervention for people with various stages of readiness may not be the most effective method for further study. Validated instruments for outcome evaluation are still needed. Further research needs to focus on studying differences of people across the stages of change in order to understand exercise phenomenon and to develop outcome measures that provide accurate intervention evaluation.

Stages of Change for Exercise

Stage of change is a theoretical construct that integrates self-reported intention and behaviors to classify individuals with respect to readiness for behavioral change. There are 6 stages of change: Precontemplation, Contemplation, Preparation, Action,

Maintenance, and Termination. Precontemplation is the stage at which an individual has no intention to change to the recommended behavior within the next 6 months. Yet, it does not mean that they neither have any activity nor will not change their behavior. This means no intention to meet the specified criteria. People in the Precontemplation stage have a propensity for avoiding information, talking, or thinking about exercise. Contemplation is a stage in which they start to recognize that it is necessary to change. Individuals in this stage have the intent to change behavior within 6 months. This group needs more supports of motivation and self-confidence in order to move to action, and they have not made a commitment to take action yet. Preparation is a stage in which individuals intend to take action within a month. They have participated in some exercise, but have not met the criteria yet. The Action stage is a stage of obviously modified behavior for less than 6 months. Individuals who are exercising regularly for more than 6 months will be categorized in the Maintenance stage.

Termination is a stage in which individuals have no temptation to engage in a sedentary lifestyle and have 100% self-efficacy in engaging in regular exercise for 5 years. This stage may not be applicable to exercise behavior because sedentary individuals may always be at a risk for relapse and may continue to attempt to maintain regular exercise (Prochaska et al., 1994). Previous studies related to exercise behavior have not applied the Termination stage in their studies. Besides that, sedentary people who slip back into the problem behavior are defined as having relapsed.

Based on TTM, individuals do not change all at once, but they move through a series of five stages toward exercise behavior change. Stages of change instruments have

been found in a variety of assessment methods and formats. Stages of change have been generally measured by two different self-report methods: a discrete categorical measure and a continuous measure. The continuous measure (Greene, Rossi, Reed, Willey, & Prochaska, 1994) is a proportionate measure of the Stage of Change. It was analyzed using Principal Component Analysis and refined into a 24-item instrument to capture stages of change. The discrete measures are a "ladder" format with descriptions (Wyse, Mercer, Ashford, Buxton, & Gleeson, 1995), a six-item true/false response format (Marcus & Simkin, 1993), a 32-item descriptive statement scale (Barke, 1990), a 5-statement format with 5-choice Likert scale format (Marcus et al., 1992c), and a one item algorithm with 5 distinct response choices (Reed, Velicer, Prochaska, Rossi, & Marcus, 1997). Which format to be used depends upon the research purpose. Reed et al. (1997) examined a variety of algorithms to determine the best components of a good one. They suggested that a good algorithm should include:

1) Type, frequency, duration, and intensity of activity.
2) Clear and understandable criteria for individuals to determine whether they meet the criteria or not and what their intention level is to meet that criteria.
3) Five-choice response format for self-report method.

Researchers have to make sure that participants can provide accurate and consistent responses among the interest population on the algorithm. Therefore, testing reliability and validity of this measure is very important whenever this instrument is applied to a new behavior or population. The criterion identifying behavior achievement

is recommended based on the physical activity recommendation. However, there is still debate regarding the criteria of action for the Preparation stage (Sarkin, Johnson, Prochaska, & Prochaska, 2001).

The exercise stages of change have been applied in adolescents, young adults, middle-aged adults, and older adults (Barke, 1990; Cardinal, 1995; Gorely, 1995; Buckworth, 2002; Acquaviva, 1998; Hausenblas, 2002). In addition, patients with chronic illnesses, such as diabetes mellitus, arthritis, and cardiovascular diseases, are stratified into stages as well (Allison & Keller, 2000; Coleman, 2002; Dunbar, 2000; Hellman, 1997). Many studies demonstrated concurrent validity of the Exercise Stages of Change questionnaire by its relationship with self-reported physical activity behavior in a variety of populations (Allison & Keller, 2000; Barke, 1990; Hellman, 1997; Lee et al., 2001; Marcus & Simkin, 1993; Schumann, Estabrooks, Nigg, & Hill, 2003; Stevens, Lemmink, de Greef, & Rispens, 2000; Wyse et al., 1995). The level of physical activity significantly increased from the stages of Precontemplation to Maintenance. The persons in Action and Maintenance groups demonstrated significantly higher levels of physical activity at moderate or high level than those in the Precontemplation or Contemplation groups (Marcus, 1993; Gorely & Gordon, 1995; Marcus, 1993).

In addition, Barke and Nicholas (1990) demonstrated that the Exercise Stages of Change measure was able to differentiate older adults who differ in physical activity level. Marcus and Simkin (1993) demonstrated concurrent validity of the Stages of Exercise Adoption instrument with the standard questionnaire of the Seven Day Physical Activity Recall Questionnaire among adult employees by a significant correlation at $p<$

.05 between both measures. Wyse et al. (1995) demonstrated concurrent validity of the stages of change by using Godin's Leisure Time Exercise Questionnaire among 244 British young adults.

However, the Wyse et al. (1995) study using three stages (Precontemplation /Contemplation, Preparation, Action/Maintenance groups) demonstrated significantly different means across the stages. Hellman (1997) demonstrated that exercise time was significantly increased from Precontemplation to Maintenance stages in 349 older adults with a cardiac diagnosis after discharge from a cardiac rehabilitation inpatient program. Lee et al. (2001) demonstrated the same results in adolescents. However, a few studies demonstrated no significant differences of physical activity level across stages (Naylor, Simmonds, Riddoch, Velleman, & Turton, 1999). The Exercise Stages of Change questionnaire still needs to demonstrate reliability and validity as an important evaluation whenever the stages of change are applied in a new population.

Decisional Balance for Exercise

The Decisional Balance concept, derived from Decision Making Theory (Janis & Mann, 1977), is comprised of a cost-benefit analysis of the behavior change at that time. Originally, eight constructs were included: Instrumental benefits/costs to self/others, and approval/disapproval from self/others. Nigg (personal communication, 2002) suggested that the eight decisional balance categories may not be applicable for decision-making to exercise as an outcome measure but may be useful for an intervention study in developing a guideline. The findings of his study did not statistically confirm the eight constructs. Marcus, Rakowski, and Rossi (1992) developed a Decisional Balance

measure based on the eight subscales but eventually used only the Pros and Cons subscales. Velicer et al. (1985) demonstrated two factors of Decisional Balance for smoking cessation. Prochaska et al. (1994) confirmed two factors of decisional balance for 12 exercise behaviors and its importance to an individual's progress through the stages of change. Similarly, many studies demonstrated theoretically consistent findings of relationships between Pros and Cons scales across the stages (Gorely & Gordon, 1995; Marcus & Owen, 1992).

Many studies have applied these scales for evaluating exercise programs and determining whether or not the participants' thoughts were related to their decision making related to exercise. The Decisional Balance for Exercise scales were developed and modified for a variety of purposes. In general, each item reflects a positive aspect or negative aspect of exercise and asks the participant to judge his or her level of agreement on a particular item. The number of items on each scale varies from six to eight items.

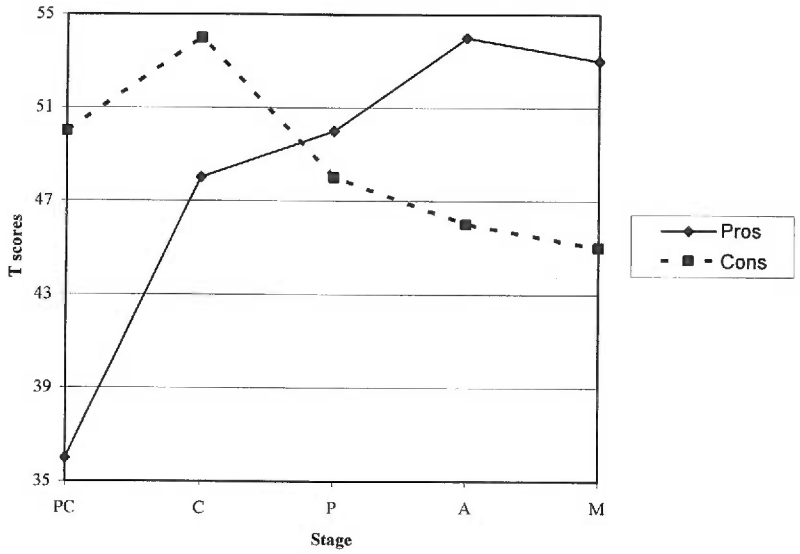
Marcus, Rakowski, and Rossi (1992) developed a Decisional Balance for Exercise questionnaire from 778 adult employees. From 40 pooled items, 16 items were retained and established two factors: 6 items of positive perception of exercise and 10 items of negative perceptions. Many studies applied the Decisional Balance instrument in exercise research (Marcus, 1994; Gorely, 1995; Herrick, 1997; Nigg, 1998; Dunbar, 2000; Buckworth, 2002; Musser, 2002; Marcus, 1992). All studies demonstrated good internal consistency of the Pros scale but some studies demonstrated that internal consistency of the Cons scale was lower than the acceptable value of .7 (Marcus & Owen, 1992; Nigg et al., 1999). Construct validity by factor analysis of the Decisional Balance for Exercise

instrument revealed a good fit between the hypothesized model and the data from 698 employees (Marcus, Eaton, Rossi, & Harlow, 1994). Based on the theoretical background of the 8 subscales, Nigg and his colleagues (1999) developed a new questionnaire from the 69 pooled items, using advanced statistical procedures to identify significant factors in the decisional balance questionnaire. The results identified two scales, Pros and Cons, which had better factor loadings and variances explained than the original eight factors. The final measure consisted of 5 items for each scale with internal consistency reliabilities of .89 (Pros) and .83 (Cons) from 529 community adults.

The pattern of relationship between Pros and Cons across exercise stages is presented in Figure 1 (Marcus et al., 1994). A person will decide to take an action when his or her behavior changes. Pros increase and Cons decrease across the stages of change. The crossover point of Pros and Cons appeared to be between the Contemplation and Action stages (Gorely, 1995; Marcus, 1994; Marcus, 1992). Many studies revealed that persons in different stages contemplated significantly differently on the importance of Pros and Cons for exercise participation (Gorely, 1995; Marcus, 1994; Prochaska, 1997; Marcus, 1992; Callaghan, 2002).

Most of the studies identifying the differences in decisional balance across stages were conducted among college students. Therefore, this concept is understudied in middle-aged or older adults (Buckworth & Wallace, 2002). Instrument reliability is important to be taken into consideration in selecting the appropriate questionnaire to evaluate outcomes. Buckworth and Wallace (2002) studied the differences of decisional

Figure 1: Pros and Cons Across the Five Exercise Stages of Change



Notes: PC: Precontemplation. C: Contemplation. P: Preparation. A: Action.

M: Maintenance. From "Assessing motivational readiness and decision making for exercise." by B.H. Marcus, W. Rakowski, & J.S. Rossi (1992a). *Health Psychology, 11*(4).

balance between Action and Maintenance stages among active college students. The results demonstrated that students who were in the Action stage had significantly lower decisional balance scores than those who were in the Maintenance stage. Callaghan et al. (2002) demonstrated that the Pros scores demonstrated significant mean differences across the five stages while the Cons scores did not among Hong Kong Chinese undergraduates. In contrast, Gorely (1995) found that both Pros and Cons made significant discrimination between the stages among older adults. Musser (2002) found inconsistent findings among individuals with mobility impairments. Each population of interest may respond to a decisional balance scale differently. Therefore, it is important to develop a questionnaire specific to the target population. Plotnikoff (2002) stated that "item construction must also take into account the language, expressions, perceptions, understanding, and culture of the target population." The decisional balance scale has been used extensively for exercise research in the U.S. However, no study has tested the appropriateness of this instrument among the Thai population before. Transcultural validity requires rigorous and systematic assessment.

Processes of Change for Exercise

The ten processes of change are strategies and techniques persons use as they progress through the different stages of change (Prochaska & DiClemente, 1983). Prochaska (1983) identified the processes theoretically from a comparative analysis of the principal systems of psychotherapy. The processes are also categorized into higher-order factors: experiential and behavioral processes. A definition of each process in its relation to exercise (Burbank, Padula, & Nigg, 2000) is presented in Table 1.

Table 1: *Processes of Change*

Process	Definition
Experiential	
Consciousness raising	Efforts by the individual to seek new information and to gain understanding and feedback about the problem
Dramatic relief	Affective aspects of change, often involving intense emotional experiences related to the problem behavior
Self-reevaluation	Emotional and cognitive reappraisal of values by the individual with respect to the problem behavior.
Environmental reevaluation	Consideration and assessment by the individual of how the problem affects the physical and social environments.
Social liberation	Awareness, availability, and acceptance by the individual of alternative, problem-free life styles in society.
Behavioral	
Counterconditioning	Substitution of alternative behaviors for the problem behavior.
Helping relationships	Trusting, accepting, and utilizing the support of caring others during attempts to change the problem behavior.
Reinforcement management	Changing the contingencies that control or maintain the problem behavior.
Self-liberation	The individual's choice and commitment to change the problem behavior, including the belief that one can change
Stimulus control	Control of situations and other causes that triggers the problem behavior

Note: From "Changing Health Behavior of Older Adults." by P.M. Burbank, C.A. Padula, & C.R., Nigg, 2000, Journal of Genrontological Nursing, 26.

The ten Exercise Processes of Change were extensively tested for validity and reliability with diverse samples and behaviors (Buckworth & Wallace, 2002; Dunbar, 2000; Marcus et al., 1992b; Nigg et al., 1999; Prochaska, Velicer, DiClemente, & Fava, 1988). The Processes of Change for Exercise measure was initially adapted from a Smoking Processes of Change scale using a sequential method of scale development (Marcus et al., 1992b). 39 items were modified by changing a word from "smoking" to "exercise". The Processes of Change for Exercise measure was redeveloped using 68 pooled items from the previous measure, and generating new items by a small group of psychologists, exercise researchers, non-exercisers, and exercisers (Nigg et al., 1999). This measure demonstrated good face and content validity, and fit the same process measurement model in different populations including college students (Nigg et al., 1999) and older adults (Nigg, Norman, Rossi, & Benisovich, 2001).

Evidence demonstrated that each process of change has been applied differently by individuals across the stages (Marcus et al., 1992b; Rosen, 2000). People in the Precontemplation stage use significantly fewer techniques of processes of change than those in all other groups. Marcus (1992) found no statistically significant difference in people using the experiential and behavior processes at the Precontemplation and Contemplation stages. A meta-analysis of 34 studies (Rosen, 2000) demonstrated that individuals in the Maintenance stage make significantly less use of experiential processes and greater use of behavioral processes than individuals in the Action stage.

Several studies found inconsistencies in process usage across the exercise stages of change (Marcus, 1992; Gorely, 1995; Hellman, 1997; Barrett, 1998). Two studies

found that only five of the ten processes (Self-reevaluation, Consciousness Raising, Counterconditioning, Self-liberation, and Stimulus Control) made a significant contribution to discrimination between the stages (Gorely & Gordon, 1995; Marcus, et al., 1992). Barrett (1998) demonstrated that only Counterconditioning processes were significantly different across the stages. Hellman (1997) found no significant difference in all the processes across the stages in older adults with a cardiac diagnosis and aged 65 years or older after discharge from a cardiac rehabilitation program. Inconsistent with social support literature, the use of the helping relationships process was found to be moderately related to the stages of change (Duncan & McAuley, 1993). It is crucial to note that the previously mentioned studies used cross-sectional designs.

Possible explanations of the inconsistent findings may be the study design, the Processes of Change for Exercise questionnaire, or both. Nigg & Courneya (1998) stated that the processes of change are curvilinear across the stages. Therefore, to study relationships or predictability of the processes of change across the stages longitudinal study may be more appropriate. A prospective study would provide greater understanding regarding whether these processes can be applied to all stages of exercise or only to some particular stages.

Self-efficacy for Overcoming Barriers to Exercise (SEOBE)

Self-efficacy was derived from Social Cognitive Theory based on a model of triadic reciprocal determinism, in which personal, behavioral, and environmental factors operate interactively as determinants of each other (Bandura, 1997). Bandura stated that human behavior is regulated by forethought. Perceived self-efficacy is a judgment of

one's capacity to perform a particular behavior successfully and forms a central concept of Social Cognitive Theory. Self-efficacy refers to the perceived ability to "organize and execute courses of action required to attain designated types of performance" (Bandura, 1986). Self-efficacy for Overcoming Barriers to Exercise is the confidence a person feels about performing exercise, including confidence in overcoming the barriers to performing physical activities (Bandura, 1997). Therefore, the self-efficacy measurement must be specific to exercise and to the barriers faced by a person who attempts to perform exercise ((Maibach & Murphy, 1995).

The relationship between self-efficacy and exercise has been demonstrated to be both reliable and substantial, despite diverse samples, measurement instruments, and measurement timing (Clark, Pera, Goldstein, Thebarge, & Guise, 1996). Self-efficacy was recognized as the strongest influence on exercise across culture (Clark et al., 1996; Conn, 1998; Hays & Clark, 1999; McAuley, 1993). People with higher self-efficacy maintain a sense of energy for being active, perceive less effort in doing activity, and report more positive affect from being active. The influences of age and gender on self-efficacy have been inconsistent. Some studies demonstrated a significant association in which participants who were either older in age or female, had lower exercise self-efficacy, while other studies did not find significant relationships among these factors (Clark & Nothwehr, 1999; Resnick, 1998; Resnick et al., 2000). Many studies have demonstrated that exercise self-efficacy scores increase in a linear relationship with advancing stages of change (Marcus & Owen, 1992; Marcus et al., 1992b; Sallis, Patterson, Buono, Atkins, & Nader, 1988).

Several studies in Thailand applied exercise self-efficacy in cardiovascular patients and older adults (Chinuntuya, 2001; Inkoom, 1997; Ngaosornskul, 2000; Vannarit, 1999; Yamchanchai, 1995). However, the available scales of the self-efficacy instrument use a response format that asks people to rate how true each statement regarding doing exercise is when they are faced with a particular barrier (not at all true to very true). The original scale was developed for an adolescent population. Types of barriers may not cover all potential barriers for populations of other ages. Bandura et al. (2001) suggested that a self-efficacy scale response should demonstrate the strength of efficacy beliefs by rating how confident they are that they can do exercise as of now. Bandura also suggested using a unipolar scale response ranging from minimum to maximum strength. In summary, the currently available Thai version self-efficacy measures are limited by an incomplete range of perceived barriers, use of a bipolar response format, and original development from an adolescent population.

Social Influences on Exercise

The concept of social influence is based on symbolic interactionism. Individuals develop their own self through social interaction. The relationship between society and the individual is dynamic and allows learning through interaction (Baron & Byrne, 1991). Alcock, Carment, and Sadava (1991) stated that social influence is "either real or imagined pressure to change one's behavior, attitudes, or beliefs". This is equivalent to the statement "alteration of one's behavior, feelings or attitudes by what others say or do, either individually, or collectively (Baron & Byrne, 1991). Human behavior is an individual's experience which harmonizes with the culture of the group (Vernon, 1965).

The experience may be positive, negative, or both. Social influences related to exercise behavior may involve social support effect, negative social influence, or both. Thus, this is the beginning of the exploration for the concept of social influences by looking at both positive and negative effects as a "double-edged sword". Intervention studies related to exercise can be designed not only to increase the supportive interactions but also to decrease the negative interactions such as inhibitive behaviors, justifying behaviors, and criticizing behaviors.

Studies have confirmed that the highest prediction power of social influences are companionship support from friends, esteem support from family and friends, inhibitive behavior from health professionals, justifying behavior from family, and criticizing behavior from family (Chogahara, Cousins, & Wankel, 1998; O'Brien, 1996). Age and gender were also related to social influences (Chogahara et al., 1998; O'Brien, 1996; Wankel, Mummery, Stephens, & Craig, 1994). Support from friends and family has been consistently and positively related to exercise (Dishman, 1994; Sallis, Hovell, & Hofstetter, 1992). Increasing exercise participation and motivation to commence and maintain a physical habit were influenced by support from family members, friends, and spouse (Clark et al., 1996; Courneya & McAuley, 1995; King, Taylor, Haskell, & DeBusk, 1990). Research on cardiac rehabilitation revealed that social support from a spouse increased the level of exercise (Godin & Shephard, 1985).

Most Thai studies in the exercise sciences focused on the positive influences in social relationships such as social support (Charoenkitkarn, 2000; Chinuntuya, 2001; Inkoom, 1997). Social support was found to be a significant predictor of exercise but the

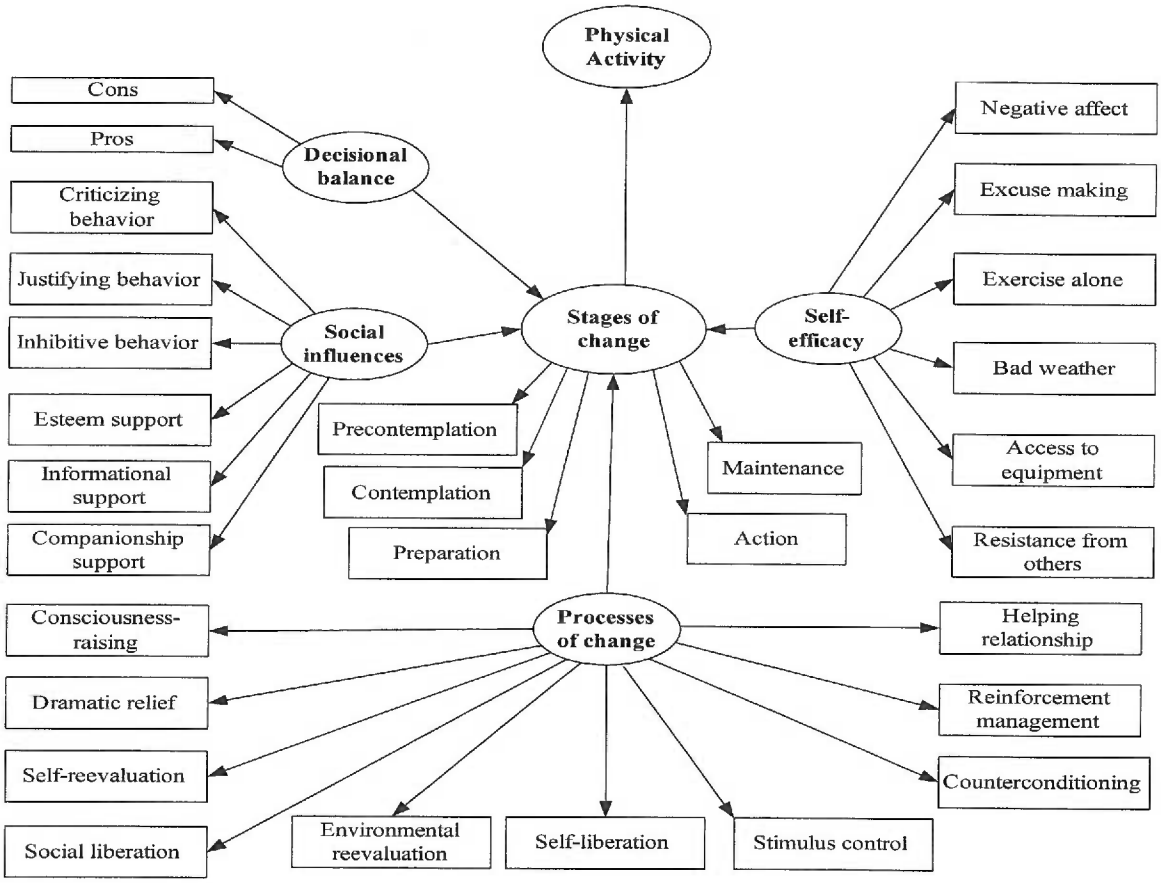
negative influence was not studied. Chogahara (1999) found that negative social influence was a unique concept and was unrelated to positive influences. Therefore, there is a need for further attention to psychometric properties of both positive and negative social influences. The current study will test the conceptual construct by comparing the original scale of the positive and negative social influences in the Thai context.

Conceptual Framework

The conceptual framework for this study is shown in Figure 2. The included variables related to physical activity were selected based on the Transtheoretical Model (TTM) and the concept of social influences. Those concepts are physical activity, stages of change, processes of change, decisional balance, self-efficacy for overcoming barriers, and social influences. Physical activity is defined as the outcome measure of this framework. The independent variables include Decisional Balance for Exercise, Processes of change for Exercise, Self-efficacy for Overcoming Barriers to Exercise, and Social Influence for Exercise. A moderator of this framework is Exercise Stages of Change. The effects of the independent variables on physical activity depend upon the participant's current exercise stage of change.

Decisional Balance for Exercise has two scales: Pros and Cons. Processes of Change for Exercise includes ten processes of experiential and behavioral processes: five experiential processes (Consciousness-Raising, Dramatic Relief, Environmental Reevaluation, Self-Reevaluation, and Social Liberation) and five behavioral processes (Counterconditioning, Helping Relationships, Reinforcement Management, Self-Liberation, and Stimulus Control). Self-efficacy for Overcoming Barriers to Exercise

Figure 2: Conceptual Framework and Measurement



posed six major scales of potential barriers including negative affect, excuse making, exercising alone, access to equipment, resistance from others, and bad weather. Social Influences on Exercise has 6 scales: companionship support (participating exercise together), informational support (providing information you should know), esteem support (providing esteem support that you are good in exercising), inhibitive behavior (disapproval and discouraging that you should not do exercising), justifying behavior (excusing or overprotective that you do not need to do exercising), and criticizing behavior (demanding or blaming that you are not good at doing exercise). The measurement model of each concept is presented in Figure 2. The reliability and validity of the questionnaires to measure these variables have been well evaluated in American and other Western populations.

Summary

Coronary artery disease is one of the leading causes of morbidity and mortality in Thai elders. The important roles of physical activity or exercise on the development and prevention of CAD are well recognized and supported by strong evidence. Based on the Transtheoretical Model, the factors of Decisional Balance for Exercise, Self-efficacy for Overcoming Barriers to Exercise, Processes of Change for Exercise, and Stages of Change for Exercise were included in this study. Because cultural embeddedness shapes the ways in which efficacy beliefs are developed, Thais raised in Thai culture, which is more likely to judge people under the family or society context, may behave differently from those raised in more individualistic cultures. Therefore, the Social Influence for Exercise factor, especially from family members and friends may be significant and was

also included in this study. The aims of this study were to evaluate the clarity, cultural appropriateness, and psychometric properties of the six measures among Thai middle-aged and older adults with coronary artery disease. The psychometric properties included internal-consistency reliability, item analysis, construct validity, and concurrent validity. In addition, this study also determined standardized mean differences of the scale scores of the five final measures across Exercise Stages of Change.

CHAPTER 3: METHODS

Design

The measurement validation study used cross-sectional data to validate questionnaires related to exercise in Thai middle-aged and older adults with Coronary Artery Disease (CAD). This design was selected because it minimizes variation in situation factors of administration time and cost effectiveness to answer research questions related to the constructs of these instruments. The questionnaires included Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults (CHAMPS) (Stewart et al., 2001), Exercise Stages of Change (ESC) (Marcus et al., 1992c), Decisional Balance for Exercise (DBE) (Nigg et al., 1998), Self-efficacy for Overcoming Barriers to Exercise (SEOBE) (Benisovich et al., 1998), Processes of Change for Exercise (PCE) (Nigg et al., 1999), and Social Influences on Exercise (SIE) (Chogahara, 1999).

The study had a preliminary questionnaire modification process and two phases for measurement validation. DeVellis (2003) suggested that during scale development the more item candidates you have, the more benefits the researcher will get of reliability and validity. Some questionnaires in this study were modified, and new items were added into each scale based on literature review, clinical experience, and 10 personal interviews with Thai older adults (2001). The details of this process are described in the preliminary item modification section. All measures were then translated into Thai language following Brislin's (1970) guideline for back-translation for cross-cultural research. The modified questionnaires in the Thai version were administered in Phase I: Content Validity

Evaluation Phase, and Phase II: Psychometric Property Evaluation Phase. The details are covered in the following sections.

Preliminary Questionnaire Modification

This study attempted to confirm the conceptual equivalences of exercise outcomes and five selected concepts related to exercise within Western and Thai cultures. Six concepts were selected: physical activity, exercise stages of change, decisional balance for exercise, self-efficacy for overcoming barriers to exercise, processes of change for exercise, and social influences for exercise. Due to the lack of validated questionnaires of these concepts for Thai patients with Coronary Artery Disease, the measures were modifications of the existing Western measures with the addition of some pertinent items from the literature, clinical experience, and personal interviews with Thai older adults.

All modified questionnaires were reviewed by two exercise researchers and a non-professional person who is an English native speaker (Names and qualifications are presented in Appendix A). Two exercise researchers were asked to evaluate consistency of all added items with their related scales and clarity of the added items. A nonprofessional English native speaker was asked to evaluate the clarity of all items in the questionnaire package. Based on their suggestions and feedback, the wordings of the items were revised. After the revisions, all measures were translated into Thai language by a back-translation process (Brislin, 1970). The original English version and the revised version of each questionnaire are described in Description of the Instruments.

Description of the Instruments

Personal Information Questionnaire (PIQ)

The Personal Information Questionnaire consisted of 29 items of demographic and health history questions. The demographic questions gathered information about age by birthday, gender, education, marital status, living situations, employment status, weight in kilograms, height in centimeters, previous or current working characteristics, health habits of low-fat diet consumption, and current and history of smoking. The demographic questionnaire is presented in Appendix B. Age was identified by the exact number of years from date of birth to the study date and was stratified into five-year periods (45-49 years, 50-54 years, 55-59 years, 60-64 years, 65-69 years, 70-74 years, and 75 years and older). The question regarding working characteristic asked about the degree of physical activity in their work. Choices ranged from sedentary working (mostly sitting) to highly physical active (mostly walking with carrying an object with weight greater than 2.5 kilograms. The medical history questions were 17 items in "Yes/No" format related to chronic illness history. In this study, the PIQ was administered last because the responses would be less likely affected by the participants' fatigue.

Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults (CHAMPS)

Original English Version.

The purpose of this study was to validate a physical activity questionnaire as an outcome measure that can demonstrate both accurate types and caloric expenditure of physical activities done by Thai middle-aged and older adults with CAD diagnosis. This

study desired to explore all leisure activities included from nonphysical activity to general types of physical activity and exercise specific to the standard recommendation.

Physical activities were measured using the Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults (CHAMPS)(Stewart et al., 2001). The CHAMPS questionnaire was developed to use as an outcome measure of a physical activity promotion intervention for older adults. This questionnaire focuses on exercise and life-style physical activities. To minimize social desirability of inactive people to respond this scale, the CHAMPS included nonphysical activities into the list as well, such as social activities and hobbies. To accommodate possible changes in cognitive and vision function that could influence older adults' ability to report their physical activities, the measure developer used a 14-font type size for vision, a 4-week period for memory recognition, and assessed lower intensity physical activity.

The CHAMPS questionnaire (2000) is a 40-item scale of a comprehensive list of leisure activities. The questionnaire assesses intensity, frequency, and duration of activities that people have done within a typical week during the past month. Three questions are asked regarding each activity: was the activity done—Yes/No, if yes, two questions of frequency and duration are asked. The exact number of frequency of a particular activity is reported. The duration is reported on a 6- point Likert scale: less than 1 hour, 1 – 2.5 hours, 3 – 4.5 hours, 5 – 6.5 hours, 7 – 8.5 hours, and 9 or more hours. All physical activities are reported into frequency per week and estimated caloric expenditure per week in physical activity. Both frequency and caloric expenditure are derived based on moderate or greater intensity (MET value equal or greater than 3) and all specified

physical activity. However, nonphysical activities are not used for caloric expenditure calculation. The MET value of each activity was adjusted in order to be appropriate for older adults (Stewart et al., 2001). The formula for caloric expenditure calculation followed the guidelines of Stewart et al. (p. 1135-36, 2000). The methods of administration are self-administered, telephone-administered, or face-to- face interview. The CHAMPS was developed specifically for older adults; therefore, the questionnaire format is a font size of 14 with a line across the page for each item in order to read easier for older adults. The time to complete is estimated at 15 minutes.

Stewart et al. (2001) demonstrated reasonably good reliability, validity, and sensitivity to change of this measure for 249 members of a Medicare HMO. For estimating reliability, six-month stability of physical activity level from two groups not expected to change was estimated by Intraclass Correlation Coefficient (ICC). The moderate level and all levels of physical activity of the CHAMPS questionnaire demonstrated that the caloric expenditure measures (ICC = 0.67 and .66, respectively) had better intraclass reliability coefficients and reliability stability coefficients than did the frequency measures (.58 and .62, respectively) over a 6 months period.

Known-groups mean differences and correlation coefficients between caloric expenditure values and health measures were estimated to demonstrate construct validity and concurrent validity, respectively. The health measures were body mass index, two physical performances, and four self-reported health-related quality of life (Physical Functioning, Vitality, Bodily Pain, and Mental Health). The "no set aside time for exercise" group demonstrated a significantly lower level of activity than the 'active'

groups at $p < 0.001$. For concurrent validity, the correlations with four scales of SF-36 were low in magnitude from .05 with Bodily Pain to .3 with Physical Functioning. In addition, this measure demonstrated significant sensitivity to change with an effect size of small to medium (.38-.64). Overall, this measure has been demonstrated as appropriate to use as an outcome measure for physical activity assessment.

Modified Version.

The original measure demonstrated good reliability and validity but for this study the researcher modified the CHAMPS as described in the following section. The original version of the CHAMPS questionnaire was modified by deleting all items that ask about frequency per week of each activity and adding a new item asking about frequency of physical activity of at least a moderate level. Because this instrument was applied to assess the amount of activities of Thai middle-aged and older adults, only intensity and duration values were used to compute the total caloric expenditure per week.

The frequency of each activity at light or moderate level is difficult to recall than those at vigorous level (Blair et al., 1991; DiPietro, Caspersen, Ostfeld, & Nadel, 1993; Durante & Ainsworth, 1996; Stewart et al., 2001). In addition, from personal interviews of ten Thai older adults (2001), the researcher found that three participants responded to the question regarding the weekly duration by reporting their usual session duration. Therefore, the researcher eliminated the 37 questions asking about the frequency of each activity. Based on the activity recommendation from the Centers for Disease Control and Prevention (1996), it is important to identify whether individuals meet the recommendation of 30 minutes per day, five or more days per week, at moderate intensity

level of activity. An item was added: "In general, how many days per week did you usually do physical activity accumulating at least 30 minutes at a level that caused you to increase your breathing rate and break a sweat?"

More than 80% of Thai people with coronary artery disease are older than 50 years old (Jitsacorn, 2000); therefore, MET values modified for the US older adults of the CHAMPS questionnaire may provide appropriate types and intensity of activities for the Thai population. Because of differences of culture and geography between the US and Thailand, some items were deleted. There were "Walk uphill and hike uphill", "Skate", and "Swim moderately or fast." These items were not applicable among middle-aged and older Thai adults. The geography of Thailand, especially in Bangkok, is flat. Skating and swimming are considered as activities for younger persons. Items of "swim slowly" and "water exercise" were retained in the scale because some Thai older adults accept these activities as appropriate for their generation.

The modified CHAMPS questionnaire included 39 items. Thirty-seven items addressed specific activities, one item asked about "other activities", and one added item asked participants to specify how many days of the typical week they engaged in at least 30 minutes of physical activity. Moderate activities were defined as physical activities with an intensity of three METs (metabolic equivalent) or greater and included walking briskly, jogging, dancing, golfing without using a cart, single and doubles tennis, riding a stationary cycle or bicycle, gentle swimming, water exercise, aerobics, heavy household chores, and gardening. Scoring on the CHAMPS questionnaire was estimated into two values; kilocalories (kcal) per week of moderate-intensity or greater activities, and kcal

per week of all physical activities. The modified CHAMPS questionnaire is provided in Appendix B.

Exercise Stages of Change questionnaire (ESC)

Original English Version.

Exercise Stages of Change is a theoretical construct that combines self-reported intention and exercise behavior. It represents individuals' readiness for changing exercise behavior. This study aim was to validate a measure to categorize participants with respect to their readiness to exercise regularly. An algorithm with a single question using a five-stage response-choice format was selected for measuring Exercise Stages of Change (Reed et al., 1997). Each response represents a stage. Participants are required to select only one stage that best described their current stage of change for regular exercise. Many studies have demonstrated concurrent validity of the measure with physical activity measures. They demonstrated a consistent finding that progressing stages were associated with increasing amounts of physical activity (Barke, 1990; Courneya & McAuley, 1995; Marcus & Simkin, 1993; Schumann et al., 2002; Wyse et al., 1995).

Modified Version.

According to the activity recommendation from the Centers for Disease Control and Prevention (1996), current health promotion focuses on an increase in moderate intensity exercise at a level that accumulates at least 30 minutes on most or preferably all days of the week for adults. Based on the suggestions of Reed et al. (1997) for a staging algorithm, an exercise algorithm needs to have an explicit definition, state all parameters needed to meet the criterion, and remind individual to assess their own intention to meet

the criteria. The definition and examples of exercise were modified to the recommendation. The description is the following:

> Exercise is any planned physical activity performed to increase physical fitness (e.g. brisk walking, jogging, bicycling, swimming, dancing, or any other physical activity where exertion is similar to this).
>
> Regular exercise means accumulating 30 minutes or more of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat.
>
> For example, in one day you could take one 30-minute brisk walk or three 10-minute brisk walks. If you do at least this amount of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat, then you are doing regular exercise.

The question was "Do you exercise regularly according to the definition above?" The response options were a)"No, and I do not intend to begin exercising regularly in the next 6 months," (Precontemplation); b) "No, but I intend to begin exercising regularly in the next 6 months," (Contemplation); c) "No, but I intend to begin exercising regularly in the next 30 days," (Preparation); d) "Yes, I have been, but for less than 6 months," (Action); e) "Yes, I have been for more than 6 months (Maintenance)." The ESC measure was used in the present study did meet these criteria. The Exercise Stages of Change questionnaire is provided in Appendix B.

Decisional Balance for Exercise Questionnaire (DBE)

Original English Version.

The Decisional Balance for Exercise questionnaire, based on a theoretical component of the Transtheoretical Model was designed to provide a valid measure of an individual's decision-making to exercise regularly based on increasing or decreasing strength of his or her balancing perception between gain and loss of taking action. Nigg et al. (1998) developed a ten-item decisional balance scale for exercise. The scale

measures the relative weighing of the costs (Cons) and the benefits (Pros) of engaging in exercise. The participants assigned relative importance on a 5-point Likert scale (0 = not at all important, 1 = somewhat important, 2 = moderately important, 3 = very important, and 4 = completely important).

Nigg et al. (1998) demonstrated the construct validity from both confirmatory factor analysis and mean differences across the exercise stages. The constructs of the measure from 352 adults aged 43±15 years (mean ± SD) confirmed two factors of Pros and Cons with factor loading of each item in a range of .66 to 88, a Goodness-of-Fit Index (GFI) of .92, and a Root Mean Square Residual (RMSEA) of .07. The GFI and RMSEA indicate an overall degree of fit of the predicted square residuals compared to the actual data. Each scale has five items. Internal consistency estimates were .89 (Pros) and .64 (Cons). Construct validity of the Pros and Cons across the stages was also demonstrated by ANOVA, which was significant at $p < .001$, .05, respectively. The Tukey post-hoc demonstrated that only the Pros were significantly different from each other (PC<P<A, M and C<A, M) while Cons were not.

Modified Version.

Based on the literature and personal interviews with ten Thai older adults, six new items were added (three Pros items and three Cons items). These were "I would have stronger bones and muscles if I exercised regularly" (Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2001), "I am too shy to exercise with other people," "I would have better heart function if I exercised regularly," "I would get pain or discomfort from exercise," "Exercise gives me companionship with others," and "My health concerns

prevent me from exercise." Items and their corresponding scales are presented in Table 2. The modified Decisional Balance for Exercise questionnaire was a 16-item measure with eight items in each scale (See Appendix B). The response format was a 5-point Likert scale as in the original measure. A higher score of Pros means an individual perceives more benefits of exercise while higher score of Cons means an individual perceives more costs of exercise. In addition, the degree to which an individual rates the Pros of exercise higher than Cons is related to stage of readiness to exercise regularly (Prochaska et al., 1994).

Self-Efficacy for Overcoming Barriers to Exercise questionnaire (SEOBE)

Original English Version.

Benisovich et al. (1998) developed a multidimensional scale of self-efficacy for overcoming barriers to exercise. This instrument was designed to measure self-efficacy expectations related to the ability to continue exercise in the face of challenges. The six scales were negative affect, excuse making, exercising alone, access to equipment, resistance from others, and bad weather. The original scale had 18 items with six scales designed to measure participants' perceived capabilities to exercise in the face of barriers to participation. A 5-point Likert scale (0 = not at all confident, 1 = somewhat confident, 2 = moderately confident, 3 = very confident, and 4 = completely confident) was administered to assess how confident participants were to exercise when they faced these barriers. The internal consistencies of the six scales were in a range of .77 to .87. Construct validity was demonstrated by good factor loadings of .78 to .85 with a Comparative Fit Index (CFI) of .95 and RMSEA of .07. The CFI indicates the fit of

Table 2: *The 16 Items of Decisional Balance for Exercise and Their Subscales*

Items	Subscale
1. I would have more energy to do activities for my family and friends if I exercised regularly.	Pros
3. I would feel less stressed if I exercised regularly.	
5. I would be in a better mood after exercising.	
7. I would feel more comfortable with my body if I exercised regularly.	
9. Regular exercise would help me have a more positive outlook on life.	
11. I would have stronger muscles and bone if I exercised regularly.*	
13. I would have better heart function if I exercised regularly.*	
15. Exercise gives me companionship with others.*	
2. I would feel uncomfortable if people saw me exercising.	Cons
4. Exercise decreases my time that I can spend with my friends.	
6. I feel uncomfortable in exercise clothes.	
8. There is too much I would have to learn to exercise.	
10. Exercise puts an extra burden on my significant other.	
12. I am too shy to exercise with other people.*	
14. I would get pain or discomfort from exercise.*	
16. My health concerns prevent me from exercise.*	

Note. * Added item.

each model relative to the null model and the RMSEA indicates overall fit with the actual data. In addition, the six factors accounted for 23.3% of the variance in exercise behavior measured by Godin's leisure-time exercise questionnaire (Benisovich et al., 1998).

Modified Version.

The questionnaire was modified by changing five items and adding five more items for appropriateness of the context in Thailand. Three items related to resistance to exercise because of cold weather were changed to hot and raining weather. An item "My gym is closed" was deleted because this type of facility is rarely used by the target group in Thailand. This item was replaced with "transportation is not convenient (O'Neill & Reid, 1991)." Following a suggestion from an expert, an item of "I am traveling" was changed to "I am away from home often." The five new items related to barriers to exercise were added from the literature and personal interviews with 10 Thai older adults. These are "I feel too old" (Booth, Bauman, Owen, & Gore, 1997; O'Neill & Reid, 1991), "I feel physical discomfort or pain when I exercise" (McAuley, 1993), "I am experiencing personal or family problems" (Shin, Jang, & Pender, 2001), "The environment is not safe to walk" (Resnick & Jenkins, 2000), and "There is air pollution outside."

The adapted measure was a 23-item scale to measure self-efficacy for overcoming barriers to exercise. Items and their corresponding scales are provided in Table 3. The response format was a 5-point Likert scale as in the original measure. A higher total score on the SEOBE means the individual has more confidence in his or her ability to exercise

Table 3: *The 23 Items of Self-Efficacy for Overcoming Barriers to Exercise and Their Subscales.*

Items	Subscale
1. I am under a lot of stress.	Negative affect
2. I am depressed.	
3. I am anxious.	
4. I feel too old.*	
5. I feel I do not have the time.	Excuse making
6. I do not feel like it.	
7. I am busy.	
8. I feel physical discomfort or pain when I exercise.*	
9. I am experiencing personal or family problems.*	
10. I am alone.	Must exercise alone
11. I have to exercise alone.	
12. My exercise partner decides not to exercise that day.	
13. I do not have access to exercise equipment.	Inconvenient to exercise
14. I am away from home often.**	
15. Transportation is not convenient.***	
16. The environment is not safe to walk.*	
17. My friends do not want me to exercise.	Resistance from others
18. My family does not want me to exercise.	
19. I am spending time with friends or family who do not exercise.	

Note. * Added items. ** Modified item. *** Substituted item.

Table 3 (continued).

Items	Subscale
20. It is raining.**	Bad weather
21. It is hot outside.**	
22. There is air pollution outside.*	
23. The roads or sidewalks are slippery.**	

Note. * Added items. ** Modified item.

when these barriers are in the way to exercise. The modified Self-Efficacy for Overcoming Barriers to Exercise questionnaire is provided in Appendix B.

Processes of Change for Exercise questionnaire (PCE)

Original English Version.

The processes of change are various strategies and techniques that individuals use to change their behavior. Nigg et al. (1999) developed thirty items of processes of change for exercise. The measure was validated in 346 adults aged 18-75 years. The ten processes of change were categorized into scales that include five Experiential processes (Conscious-Raising, Dramatic Relief, Environmental Reevaluation, Self-Reevaluation, and Social Liberation) and five Behavioral processes (Counterconditioning, Helping Relationships, Reinforcement Management, Self- Liberation, and Stimulus Control). The definitions of the ten scales are presented in Table 4. The original scale has three items for each process (30 items total). Items were responded to on a 5-point Likert scale with 0 = Never, 1 = Seldom, 2 = Occasionally, 3 = Often, and 4 = Repeatedly.

The measure demonstrated good internal consistency reliabilities, construct validities by factor analysis and concurrent validity with the exercise stages of change (Nigg, et al., 1999). The internal consistency coefficients of the ten scales were in a range of .69 (Dramatic Relief) to .86 (Consciousness Raising, Self-Reevaluation, Reinforcement Management). All related items loaded well on the hypothesized factors in a range of .45 to .86 with a CFI of .88 and an AASR of .04. A high correlation between experiential process and experiential process factors was found (r = .95).

Table 4: *The 40 Items of Processes of Change for Exercise and their Subscales*

Items	Subscale
1. I read articles about exercise in an attempt to learn more about it.	Consciousness-raising
2. I look for information related to exercise.	
3. I find out about new methods of exercising.	
4. I talk to my friends and family about exercise.*	
5. I get upset when I see people who would benefit from exercise but choose not to exercise.	Dramatic relief
6. I am afraid of the consequences to my health if I do not exercise.	
7. I get upset when I realize that people I love would have better health if they exercised.	
8. I worry that I may have a heart attack like my friends who were inactive.*	
9. I realize that if I do not exercise regularly, I may get ill and be a burden to others.	Environmental reevaluation
10. I think that my exercising regularly will prevent me from being a burden to the healthcare system.	
11. I think that regular exercise plays a role in reducing health care costs.	
12. I realize that if I exercise regularly, I will be a good role model for exercise to my children.*	

Note. * Added items

Table 4 (continued)

Items	Subscale
13. I feel more confident when I exercise regularly.	Self
14. I believe that regular exercise will make me a healthier, happier person.	reevaluation
15. I feel better about myself when I exercise.	
16. I feel that I am taking care of my health when I exercise.*	
17. I have noticed that many people know that exercise is good for them.	Social
18. I am aware of more and more people who are making exercise a part of their lives.	liberation
19. I have noticed that famous people often advertise the fact that they exercise regularly.	
20. I am aware of an increase in exercise activity at senior center in my community.*	
21. When I feel tired, I make myself exercise anyway because I know I will feel better afterwards.	Countercondi -tioning
22. Instead of taking a nap after work, I exercise.	
23. Instead of relaxing by watching TV or eating, I take a walk or exercise.	
24. When I feel blue or sad, I make myself exercise.*	

Note. * Added items

Table 4 (continued)

Items	Subscale
25. I have a friend who encourages me to exercise when I do not feel up to it.	Helping relationships
26. My friends encourage me to exercise.	
27. I have someone who encourages me to exercise.	
28. I have someone to exercise together.*	
29. One of the rewards of regular exercise is that it improves my mood.	Reinforcement management
30. I try to think of exercise as a time to clear my mind as well as a workout for my body.	
31. If I engage in regular exercise, I find that I get the benefit of having more energy.	
32. I like the social interaction after exercise.*	
33. I tell myself that I can keep exercising if I try hard enough.	Self-liberation
34. I make commitments to exercise.	
35. I believe that I can exercise regularly.	
36. I have told others that I have a commitment to exercise.*	
37. I keep a set of exercise clothes conveniently located so I can exercise whenever I get the time.	Stimulus control
38. I use my calendar to schedule my exercise time.	
39. I make sure I always have a clean set of exercise clothes.	
40. I ask my friends to remind me about exercising.*	

Note. * Added items

Modified Version.

Based on personal interviews with 10 Thais and the need for statistical power of factor analysis that was planed, one more item was added for each process. The final version of the Processes of Change questionnaire had forty items. Table 4 presents items categorized by the 10 processes that were used as scales. The ten new items included "I talk to my friends and family about exercise," "I worry that I may have a heart attack like my friends who were inactive," "I realize that if I exercise regularly, I will be a good role model for exercise to my children," "I feel that I am taking care my health when I exercise," " I am aware of an increase in exercise activity at the senior center in my community," "When I feel blue or sad, I make myself exercise," "I have someone to exercise together," "I like the social interaction after exercise," "I have told others that I have a commitment to exercise," and "I ask my friends to remind me about exercising. The modified PCE was a 40-item measure with a 5-point Likert scale response format as in the original measure. Items and their corresponding scales are provided in Table 4. A higher score on each scale means a particular process is applied more frequently related to exercising. The modified Processes of Change for Exercise questionnaire is provided in Appendix B.

Social Influence on Exercise questionnaire (SIE)

Original English Version.

This measure was a multidimensional scale of positive and negative social influences on exercise in older adults (Chogahara, 1999). This measure was validated in 479 older adults from multi settings of public and private senior centers. The measure

was a 27-item questionnaire with a response format of a 5-point Likert scale. The positive social influence scale consisted of three scales: Companionship Support (participating exercise together), Informational Support (providing information you should know), and Esteem Support (providing esteem support that you are good in exercising). Each scale had five items. The negative social influence scale consisted of three scales: Inhibitive Behavior (disapproval and discouraging that you should not do exercising), Justifying Behavior (excusing or overprotective that you do not need to do exercising), and Criticizing Behavior (demanding or blaming that you are not good at doing exercise). Each scale had four items.

A five-point frequency scale, ranging from 0 (never), 1 (seldom), 2 (occasionally), 3 (often) to 4 (very often), was used to measure the occurrence rate of specific social influences during the past 12 months. The original measure identified three major categories of sources of social influences: family member, friends, and health care professionals. The participants were asked to rate separately the frequency that family, friends, and professionals had done the items. The items and their scales are provided in Table 5.

The social influence measure demonstrated good internal consistency reliabilities and two-week stabilities in each of three categories: family, friends, and professionals (Chogahara, 1999). Cronbach alpha coefficients were greater than .7 indicating good reliability, except the scale of criticizing behavior from the professionals which had a Chronbach's alpha of .64. The stabilities of all scales tested in 59 participants were greater than .5, which is an acceptable value. The items of the related six scales

Table 5: *The 27 Items of Social Influences on Exercise and their Subscales*

Items	Subscales
1. Made plans with you for doing an exercise together?	Companionship support
2. Teamed up with you to engage in an exercise together?	
3. Promised you that they would participate in an exercise with you?	
4. Given you helpful reminders to do an exercise together with them?	
5. Changed their schedules so you can do an exercise together?	
6. Informed you about the expected positive effect of an exercise on your health?	Informational support
7. Explained to you why an exercise is important to change your health?	
8. Clarified for you how you may achieve your health goals through an exercise?	
9. Suggested an exercise program or facility, which might assist your health?	
10. Explained to you about the amount or intensity of an exercise necessary for improving your health?	
11. Complimented you on the mastery of an exercise skill?	Esteem support
12. Praised you that your exercise level is superior to that of other people at your age?	
13. Affirmed that you have done well in your exercise?	
14. Shown their respect for your versatility in an exercise?	
15. Told you that you should be proud of your exercise skills?	

Table 5 (continued)

Items	Subscales
16. Warned you that starting an exercise would worsen your health?	Inhibitive behavior
17. Advised you to avoid an exercise in order to avoid injury or ill health?	
18. Told you that you should keep away from an exercise in order not to have falls or accidents?	
19. Forbidden you to engage in an exercise because of the potential health risk?	
20. Told you that more exercise is not necessary for you because you are very busy in your other daily routines?	Justifying behavior
21. Told you that you do not need to do more exercise because you are healthy enough?	
22. Told you that you do not need to do more exercise because you know how to care for your health?	
23. Told you that more exercise is not necessary for you because it is not appropriate for your age?	
24. Excluded you because of your low ability in an exercise?	Criticizing behavior
25. Forced you to do an exercise which you disliked?	
26. Complained that your skill in an exercise is not good enough?	
27. Criticized your low skill level in an exercise?	

demonstrated good construct validity with significant factor loadings in the range of .73 to .93 from family, .75 to .94 from friends, and .69 to .96 from professionals. The six-scale measurement models of three social influence resources demonstrated a good fit with the data with a non-significant Chi-square, Adjusted Goodness-of-Fit Index (AGFI) in a range of .95-.96 and the CFI of 1. In addition, the six scales of social influences demonstrated better model fit than the two-factor model (Positive and Negative factors) with significant chi-square difference (χ^2_6= 437.59, $p < .001$). Concurrent validities of this measure were demonstrated by significant association between three resources of social influences and caloric expenditure of a 7-day recall physical activity at $p < .001$ after controlling for some demographics (O'Brien Cousins, 1996). All positive influences positively significant associates with the caloric expenditures ($\beta = .24–.32$) while all negative influences had negatively significant correlations with those ($\beta = .17 –.25$).

Modified Version.

Although Chogahara (1999) indicated that it would be helpful to assess the three resources of social influence (family, friends, and health care professional) when studying factors that influence physical activity. The researcher decided not to do so in order to reduce subject burden by shortening the questionnaire, which would be administered with several other questionnaires. The original English version was modified by eliminating the three resources questions and used the introduction question of "During the past 12 months, how often have your family and friends." The PCE measure already has an item asking about talking with a personal doctor about exercise. It may be used as a guideline for the significance of professional resources. Therefore, the

modified Social Influence on Exercise questionnaire consists of 23 items of six scales with a response format of a 5-point Likert scale like the original English version.

Translation Process

The translation process of the study followed a guideline for back-translation for cross-cultural research by Brislin (1970). Brislin suggested that translation should be performed by at least two independent translators and undertaken by teams. Three high school teachers of English in Bangkok carefully conducted the translation process for this study. The resulting three target language versions of each instrument were evaluated by the researcher and concerns with translation were discussed with the translators. Notes were kept during the rephrasing process to ensure accurate recording of the data. A target version of each instrument was finalized by the researcher based on discussions with the three translators. The target version of each instrument was back translated into English.

At least two back-translators are recommended and back-translators without a priori knowledge of the original English version of instruments should be free of bias (Brislin, 1970). Therefore, unexpected meanings or interpretations may be revealed in each final version. Three bilingual persons who have degrees in linguistics conducted the back-translation. The results were 3 back-translations of each instrument. The English version and all back-translation versions were compared by an expert in exercise research and a person who has no expertise in research but who is a native speaker of English. Their comparison considered semantic, idiomatic, experiential, and conceptual equivalence (Brislin, 1970). Discrepancies between the English and back-translation versions (Monolingual meaning errors) were discussed between the researcher and

research committee to develop the final Thai version. If necessary, some items on the Thai scales were modified to achieve concept equivalence across cultures. The final six modified measures in the Thai version were tested for content validity in Phase I.

Phase I: Content Validity Evaluation Phase

Because the original instruments were developed in the United States, getting information from the population of interest and experts in research and clinical practice in Thailand was required (Jacobson, 1997). Phase I of this study consisted of two sections: Phase Ia: Content validity from experts and Phase Ib: Content clarity from four focus groups of participants with a CAD diagnosis. The experts identified the content relevance of each item and its related scale; verified the item uniqueness of each sub-scale; and evaluated the clarity of the item's meaning in Thai cultural context. In addition, they suggested revisions and identified omissions. Based on the assumption that participants are experts regarding their own experiences and accurately report their own experiences, focus groups of middle-aged and older adults with CAD from different exercise stages of change were conducted to assess the clarity of items in the context of Thai culture.

Phase Ia: Content Validity From Experts

Participants

Lynn (1986) suggested five to ten experts who meet the criteria of expertise for evaluation of content validity of instruments. Seven experts agreed to be content validators of this study from the four areas of their expertise. Their expertise included two exercise researchers, a behavioral researcher, three measurement-development

researchers, and a cardiologist in Thailand. Their names and qualifications are presented in Appendix A.

Instruments

The Thai versions of modified Community Healthy Activities Model Program for Seniors questionnaire (CHAMPS), Exercise Stages of Change (ESC), Decisional Balance for Exercise (DBE), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Processes of Change for Exercise (PCE), and Social Influences on Exercise (SIE) were evaluated for content validity. The details of all instruments were described in the previous section of Preliminary Questionnaire Modification.

Procedure

The seven experts reviewed the items using the guidelines suggested by Imle and Atwood (1988). The procedure guidelines for experts to evaluate these instruments are in Appendix C. Four of six questionnaires were evaluated for content validity and clarity. These were DBE, ESC, PCE, and SEOBE. The conceptual definitions and operational definitions of these questionnaires were provided. The experts judged each item related to its congruence of the definitions, uniqueness, and clarity and understandability in the Thai context. The first two questions assessed content validity and the last question evaluated clarity. The expert's response to each item was "Yes" or "No" for content validity and clarity evaluation.

The CHAMPS and ESC questionnaires were evaluated differently. A list of activities from the CHAMPS questionnaire with two questions and possible answers was provided. The two questions and possible answers were "Are these activities appropriate

for Thais? (Yes or No)" and "What other activities should be included?" The definitions of exercise and regular exercise and two questions were provided for evaluation of the ESC questionnaire. The two questions were "Is this definition clear and understandable for Thais? (Yes or No)" and "Any comments and suggestions." These four questions provided information regarding clarity and appropriateness for Thai people.

Data analysis

According to Lynn (1986), the judgment-quantification stage of content validity requires six experts to endorse an item to establish content validity beyond the .05 level of significance. Therefore, the content validity indexes (CVI), as the proportion of items rated as "Yes" by the content validators, were calculated. The value of greater than 0.7 was acceptable (Lynn, 1986). If six out of seven experts reached agreement, the clarity of each item was confirmed. The adapted instruments were revised based on the results of the agreement criteria and all suggestions from the experts. In case of items with a lower proportion of agreements than the criteria, the researcher and two experts reviewed the items with respect to the content relevance to cultural issues. Those items were labeled and kept for further assessment in Phase Ib.

Phase Ib: Content Validity From Population of Interest

This phase was designed to evaluate the item clarity and the cultural appropriateness of all instruments for middle-aged and older adults with CAD who were in different exercise stages of change. Exercise stage of change was assessed using a self-administered questionnaire after the participants gave their informed consent. The participants from different exercise stages of change shared their perspectives.

Interactions allowed participants to express their struggles in responding to the items, listen to others' points of views, and express either their agreement or disagreement with the issues. This information was helpful in establishing generalizability across stages among middle-aged and older adults with CAD.

Setting

Phase Ib of this study was conducted at two hospitals including Ramathibodi Hospitals, Mahidol University, in Bangkok, and Central Chest Institute, Ministry of Public Health, Nonthaburi, Thailand. Authorization was obtained to access participants' names from the Deans of the School of Medicine of Ramathibodi Hospitals and the Director of Central Chest Institute. A letter of support from OHSU in obtaining patients' data was provided. Participants were contacted at the Cardiology outpatient clinics of the two hospitals and at a rehabilitation center at Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. The contact patients of this center are referred from cardiologists for exercise evaluation and prescription. Authorization was granted to access the participants' name by the director of the center.

Participants

The sample of this phase was a convenience sample. Systematic variation across the groups and small group size of 7-10 participants per group is recommended for conducting focus groups (Mertens, 1998). To include both homogenous groups for each stage and heterogeneous groups for variability across stages, focus group assignment was designed into two major groups: an exercising group and a non-exercising group. The focus groups for the exercising group were conducted among patients who had contacted

the Cardiac Rehabilitation Center at Ramathibodi Hospital. Approximately 90% of these patients had exercise training for cardiac rehabilitation and practiced exercise in their daily life. The focus groups for the non-exercising groups were selected from the patients of the outpatient clinic at the Central Chest Institute who identified themselves as either 'not exercise regularly yet' or 'no interest to exercise'. To ensure accuracy of the data, two sets of focus groups were conducted. The sample size of Phase I was 36 patients with nine patients per group.

Criteria for participant selection.

The inclusion and exclusion criteria were created to target the population of interest and diminish the effect of confounding factors on generalizability of the study findings (e.g. misunderstanding of questions because of reading ability, and severity of diseases). The inclusion criteria for participation are the following:

1) Thais, aged 45 years or older.
2) Diagnosis of coronary artery disease by appearance of at least a coronary artery occlusion from cardiac catheterization, presenting unstable angina from EKG, or positive exercise stress test.
3) Functional class I based on the Criteria Committee of the American Heart Association, New York City Affiliate (1994).
4) Ambulatory without assistance of a cane or other device.
5) Able to read and complete self-administered questionnaires. Thai language is a single language so the research instruments and consent forms are all presented to subjects in Thai.

The exclusion criteria are the following:

1) Major surgery including heart, lung, brain, vascular, abdominal, and orthopedic within the past 6 months.
2) Blindness or deafness.
3) Serious chronic illness including stroke within past year, cancer diagnosis with being on a treatment course, chronic obstructive pulmonary disease, renal diseases requiring hemodialysis or peritoneal dialysis.
4) Altered thought such as dementia, confusion, or psychosis.
5) On advanced treatment such as pacemaker or continuous oxygen therapy.
6) Other diseases that limit performing exercise such as severe arthritis.

Recruitment process.

According to the hospital systems related to the doctor's appointment process, two steps were used to contact potential participants. First, the researcher used the Potential Participant Screening Tool (See Appendix G) and hospital records to identify eligible participants with coronary artery disease. A tag was attached in front of his/ her patient medical record in order to identify eligible participants. No information was recorded from the medical records.

Second, the eligible patients were contacted by hospital staff about study participation. If an eligible patient was willing to participate, the researcher explained the purpose of the study, characteristics of the questionnaires, participation procedure, duration, risks and discomforts, benefits, alternatives, confidentiality, costs (none), liability, and the individual's right to participate and withdraw any time without any

consequence to her/his treatments from the hospitals. A patient who was willing to participate in this study signed the consent form.

Instruments

The Thai versions of modified Community Healthy Activities Model Program for Seniors Activities questionnaire for Older Adults (CHAMPS), Exercise Stages of Change (ESC), Decisional Balance for Exercise (DBE), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Processes of Change for Exercise (PCE), and Social Influences on Exercise (SIE) were evaluated for content validity as described previously. The details of all instruments were described in the previous section of Preliminary Questionnaire Modification.

Procedures

After they signed consent form and selected their stages of change for exercise, participants received the six questionnaires: Modified CHAMPS questionnaire, Modified Exercise Stages of Change, Modified Processes of Change for Exercise, Modified Social Influence for Exercise, Modified Decisional Balance for Exercise, and Modified Self-efficacy for Overcoming Barriers to Exercise. The four focus groups of nine patients each followed a strict procedure to maintain consistency and minimal bias across these groups. The researcher briefly introduced the aims of the focus group, the significance of contribution of their opinions on the development of the final questionnaires, and instructed the focus group participation. Thereafter, the researcher instructed participants in completing the packet of Thai version of modified questionnaires including CHAMPS questionnaire, Exercise Stages of Change, Processes of Change for Exercise, Social

Influence for Exercise, Decisional Balance for Exercise, and Self-efficacy for Overcoming Barriers to Exercise, respectively. No participant identification was included in the questionnaires.

The participants were asked to mark any items with a star that were unclear, difficult to answer, and/or meaningless. During the completion of the questionnaires, participants were observed by the researcher for nonverbal clues signaling potential difficulty with the task and the length of time necessary to complete the questionnaires. The durations for completing all the questionnaires ranged from 40-75 minutes.

After the participants finished answering all the measures, the researcher started the focus group discussion. The durations of the focus group were approximately 45-60 minutes. The focus group was a "guided" discussion. The six questions asked during the focus group discussion were:

1. "Were there any instructions that were not clear?"
2. "Did you have any trouble following the sequence of questions or the skip of patterns or instructions?"
3. "Were there any questions that were not clear?"
4. "Did you have any problems understanding what kind of answers were expected?"
5. "Were there any parts that irritated you or that made you feel uncomfortable?"
6. "Did you get tired or fatigued because of the time it took to answer the questionnaires?"

In order to keep the hard evidence of participants' perspective on each item after focus group discussion, the researcher reminded the participants to cross their star out if they changed their opinion on the item based on the discussion but not to erase the star. The investigator made notes on a blank questionnaire about the participants' concerns regarding the questionnaires. All information from the focus groups was used in

measurement refinement. Any changes to measures took place by the agreement of the researcher and two experts, taking into account all comments from seven experts and four focus groups.

Data Analysis

The aim of Phase Ib was to evaluate the items' clarity and the cultural appropriateness of the six measures among Thai middle-aged and older adults with coronary artery disease who had different exercise levels. Information obtained from the focus groups was analyzed for revision of the final questionnaires to improve clarity and cultural appropriateness. All hard copies of questionnaires were reviewed. With respect to the constructs of original versions of measures, the scales of each measure were kept as original scales. Items were changed following the findings from experts' opinions and focus groups based on clarity of Thai language and cultural appropriateness.

The criterion to delete specific items was that the percentage of the participants who reported having difficulty in answering the items was greater than 30% (Hartman, 1977). The researcher also considered the findings from comments of the seven experts.

Specific items that had a tag reflected some experts' concern regarding the item clarity and indicated that the item should be considered for deletion from the questionnaire. In the case of items with no tag, the percentage of participants who reported having difficulty in answering the item became a significant criterion. The number of items in each sub-scale was another criterion to consider because confirmatory factor analysis was planed. It is recommended that each scale contain at least three items (Tabachnick & Fidell, 1996). Finally, these three criteria were considered simultaneously

for the items retained for Phase II of the study. The revised measures were administered to the large group of patients with CAD in Phase II.

Phase II: Psychometric Property Evaluation Phase

The Phase II evaluated psychometric properties of the instruments in the target sample. Data were collected by self-report questionnaires: CHAMPS questionnaire, ESC, DBE, SEOBE, PCE, SIE, and personal information (demographic data and medical history). The psychometric properties that were evaluated included item intercorrelation, internal-consistency reliability, item-remainder coefficient, item difficulty, item-discrimination, concurrent validity, and construct validity. This information provided information about distribution of participants' responses to each item and scale and how well these items fit with the concepts based on the conceptual framework. The methodology, research plan, and data analysis will be described in this chapter.

Setting

Phase II of this study were conducted at the Cardiology outpatient clinics of the two hospitals including Ramathibodi Hospitals, Mahidol University, in Bangkok, and Central Chest hospital, Ministry of Public Health, Nonthaburi, Thailand.

Participants

Inclusion and exclusion criteria for participant selection and participant recruitment process were the same as Phase Ib. In order to assess the degree to which a set of item responses is consistent with the theoretical definition of the construct it was designed to measure, the sample size minimally requires at least 200, or 10 cases per an observed variable (Everitt, 1975; Nunnally & Bernstein, 1994). For the confirmatory

factor analysis by Structural Equation Modeling, the optimal sample size is at least four cases per an estimated parameter (Bentler & Chou, 1987). Large sample size is critical to the obtaining of precise parameter estimates and to the tenability of asymptotic distribution approximation (MacCallum, Browne, & Sugawara, 1996). The study analyzed each individual questionnaire. To have a good statistic power, the longest questionnaire was used to calculate sample size. The longest questionnaire consists of forty items and has 121 estimated parameters; therefore, the sample size of 484 cases was required.

Four hundred and ninety-five persons signed consent forms and responded to the questionnaires from the Cardiac outpatient clinics of the University Hospitals and the Central Chest Institute. All incomplete questionnaire packages (n = 83, 16%) were excluded from the sample for this study. Sample size of Phase II was 412 subjects who completed the six questionnaires including the Community Healthy Activities Model Program for Seniors Activities for Older Adults (CHAMP), Decisional Balance for Exercise (DBE), Processes of Change for Exercise (PCE), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Social Influence for Exercise (SIE), and Exercise Stages of Change (ESC). The sample size is a small but minimally acceptable size of nine cases per observed variable.

Instruments

Eight questionnaires were used in Phase II. Modified Thai versions of the CHAMPS questionnaire, Exercise Stages of Change, Processes of Change for Exercise, Social Influence for Exercise, Decisional Balance for Exercise, and Self-efficacy for

Overcoming Barriers to Exercise were administered in random order. Again, the last two questionnaires were the Thai version of SF-36 and the demographic questionnaire, respectively. The details of all measures were described in the previous section except the Thai version of Health-related Quality of Life questionnaire (SF-36).

Health-related Quality of Life questionnaire (SF-36).

The SF-36 instrument was developed to provide a valid measure to assess an individual's perspective on his/her health and functional status. There are 36 items with 8 sub-scales including Physical Functioning (PF); Bodily Pain (BP); General Mental Health (MH); Role Limitations due to Physical Problems (RP); Role Limitations due to Emotional Problems (RE); Vitality {Rywik, /6/2 RYWIK /id}; Social Functioning (SF); and General Health Perceptions (GH). One item asks about the amount of change in individual health status over the past year. This item is not used to compute a value related to the eight scales; therefore, this item was not reported in this study. The response choices of most items are Likert scales. Only the response choices of items assessing limitation in role functioning because of physical and emotional problems are dichotomous response (Yes/No).

The scores of each scale were transformed into the standard SF-36 scoring algorithms; therefore, the eight scales can be compared with each other. The transformed scores of the eight scales range from 0 to 100. A higher score means better health and functioning. The Health-Related Quality of Life (SF-36) questionnaire was translated and validated in 212 Thai cardiac patients (Krittayaphong et al., 2000). The eight scales demonstrated good internal consistency reliabilities in the range of .76-.91.

The sample size for this measure was 410. Only two cases were deleted because of having more than 20 percent missing data. The missing values of retained cases were replaced by the process of mean substitution. The mean and standard deviation of each scale are presented in Table 6. A higher score on the SF-36 indicates better health and functioning. Good health and functioning reflect having less pain and more energy. The findings demonstrated item internal consistency by significant positive correlations between a scale and each item belonging to the scale ($r = .65 - .94$) and those between the General Health scale and the other seven scales ($r = .35 - .62$) at $p < .01$. These findings were consistent with the data verification guideline of SF-36 (Ware, Jr. & Gandek, 1998)

According to Spector, Edwards, and Thompson (1992), coefficient alpha should be recomputed when a questionnaire is applied to the new sample. Therefore, before using the Thai version of SF-36 as an external criterion for reliability, the Cronbach's alphas of the eight scales were calculated for the sample of this study. The internal consistency of this study is presented in Table 6. All scales had coefficient alpha greater than .7 except the Social Functioning scale with an alpha of .58. The Cronbach's Alpha value is sensitive to the number of items and their intercorrelation (Spector et al., 1992). The coefficient alpha increases when the number of items and their intercorrelation increases. The Social Functioning scale has two items and item-intercorrelation was .38. By the scale characteristic, a low alpha was possibly found. In addition, two studies (Li, Wang, & Shen, 2003; Ren, Amick, III, Zhou, & Gandek, 1998) that validated SF-36 among Asian adults found the consistent result on the social functioning scale (See Table 7). Therefore, this scale demonstrated inconsistent internal-consistency reliability.

Table 6: *SF-36 Subscale Scores of 410 Participants With Coronary Artery Disease*

Subscale (# item)	*M*	*SD*	95% CI		Min	Max
			Lower	Upper		
General health (5)	57.29	21.50	55.20	59.38	5.0	97.0
Physical functioning (10)	65.38	17.05	63.72	67.03	15.0	90.0
Social functioning (2)	79.51	18.83	77.68	81.34	12.5	100.0
Role limitation by physical health (4)	67.26	38.29	63.54	70.97	.0	100.0
Role limitation by emotional health (3)	73.41	39.50	69.58	77.25	.0	100.0
Bodily pain (2)	69.84	22.58	67.65	72.03	.0	100.0
Vitality (4)	64.98	16.26	63.40	66.55	15.0	100.0
Mental health (5)	71.62	16.54	70.01	73.23	12.0	100.0

Table 7: *Cronbach's Alpha Coefficients of Eight Subscales From Four Studies*

Subscale (# item)	Cronbach's Alpha Coefficients			
	N = 410*	N = 122**	N = 1316***	N = 156***
General health (5)	.73	.84	.72	.82
Physical functioning (10)	.84	.91	.87	.92
Social functioning (2)	.54	.82	.39	.54
Role limitation from physical health (4)	.83	.86	.88	.82
Role limitation from emotional health (3	.90	.85	.87	.88
Bodily pain (2)	.86	.91	.80	.78
Vitality (4)	.67	.76	.66	.73
Mental health (5)	.80	.89	.75	.74

Note. * Present study, ** Krittayaphong, et al. (2000), *** Li, et al. (2003), and **** Ren, et al. (1998)

The Social Functioning scale was not appropriate to be applied as an external criterion for the concurrent validity in this study.

Procedures

The researcher was at the outpatient clinics to answer any questions during the data collection process. The time required for completing all the questionnaires was approximately 45-90 minutes. Most patients in this study completed the questionnaire packet before meeting their doctors. If more time was required, they finished while waiting for their medications.

Data Management

Data were entered two times in FileMaker Pro version 6 (2002) and both data files were exported into SPSS version 11.5 statistical software (2002). To verify the data set, the two data files were compared. A final data file was screened using frequency distribution and descriptive statistics for all the items. Data entry was corrected and the missing data were noted. Item frequencies were inspected. After general screening all data, missing value analyses by SPSS version 11.5 were performed in order to examine the patterns of missing data. Missing value analysis was conducted at four levels: individual respondent level, individual item level, scale level, and measurement level. Each level was selected depending upon the given level of analysis. This is important to note because an item with frequent missing data may indicate that participants were confused as to the meaning of the question. In addition, if a participant answered only part of the questions on a measure, the validity of the responses they gave may be in question.

At the individual respondent level, records with missing values for more than 20 % of the variables were eliminated in order to assure quality of data. The records with missing values on less than 20% of the variables were evaluated using their patterns from the tabulated patterns table produced by SPSS Missing data analysis. The patterns demonstrated whether missing occurrence was consistently in a particular scale or item. This study aim was to validate these measures for exercise research. It is significant to maintain variability of the true score. Either listwise or mean substitution was not used for all analysis at the item and scale levels. Item analyses included cases with complete data in each scale; cases with missing data were excluded by pairwise deletion.

For data analysis at scale level, confirmatory factor analysis (CFA) was conducted by Amos version 4.0, which handles missing data using full information maximum likelihood estimates to maximize bias of the variance and covariance estimates. However, several goodness-of-fit indices are not computed in the presence of missing data. Therefore, only complete cases of each measure were included for CFA. To get a summed score for each scale, the mean of each scale was computed from the available item responses using only cases having responses on at least 75% of the scale. Rates of missing values were reported in the Results Section of this study.

All items of six measures were inspected for outliers, linearity, and normality (skewness, kurtosis). If any subjects were identified as multivariate outliers, they were reported in the Results Chapter. Relative frequencies of total scores were plotted to demonstrate an observed-score distribution. A normal distribution was expected with skewness of less than two and ceiling and floor effects were examined.

Data Analysis

Data analysis of Phase II focused on demonstrating validity and reliability of the six modified measures. The six measures were the modified Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults, modified Decisional Balance for Exercise, modified Self-efficacy for Overcoming Barriers to Exercise, modified Processes of Change for Exercise, Positive and Negative Social Influence for Exercise, and Stages of Change for Exercise. Data from the six measures were analyzed based on the aims of this study. The primary aims of this study were to evaluate how well each item related to the other items within the related scale and whether the items functioned in the intended manner based on the Transtheoretical Model of Change and the original measures. The specific aims and related statistical analyses were described as the following:

Aim 1: To evaluate distribution of responses of CHAMPS questionnaire and Exercise Stages of Change.

To address Aim 1, frequency distribution testing of CHAMPS items and Exercise Stages of Change was tested. The CHAMPS and Exercise Stages of Change measures are different from the other scales. These scales categorized people based on their intention levels to change their exercise behavior and their levels of physical activities. Each item of these scales neither measures a communal dimension nor intends to correlate one to another. Therefore, internal-consistency reliability and construct validity are not applicable for these measures. The frequency distribution of responses to individual item of Exercise Stages of Change and CHAMPS questionnaires was examined to determine if

all types of physical activities were selected and the distribution of responses by stage of change. Frequency and percent of each item were reported. If an item has no selection from participants of this study, the item would be considered as either inconsequential item for the final measures or need more work to be modified.

Aim 2: To evaluate concurrent validity of caloric expenditure calculated from CHAMPS measure with the 36-Item Short-Form Health Survey (SF-36) and age.

To address Aim 2, the series of the Pearson correlation were tested. This study tested relationships between Thai version of SF-36 and Modified CHAMPS measure in order to demonstrate concurrent validity. The five scales of the SF-36 Health Survey Thai version were used as a standard Health-Related Quality of Life questionnaire. Many cross-sectional studies demonstrated positive relationships between physical activity level and these five aspects of health related quality of life (DiPietro et al., 1993; Rejeski, Brawley, & Shumaker, 1996; Stewart et al., 2001). Well-established negative correlation between age and physical activity level was found.

Hypothesis of relationships between SF-36 Health Survey and caloric expenditure values of all physical activity types and of physical activities at least moderate intensity level were based on the findings of previous studies. The hypotheses were that people who were more active with higher caloric expenditure of physical activity would have better health-related quality of life in the scales of general health, older participants would have less caloric expenditure than those who are younger. A high correlation value supports concurrent validity. The correlation range of 0.3 to 0.5 was determined as satisfactory concurrent validity (Cohen, 1977).

The following section described four specific aims for validation of modified Decisional Balance for Exercise, modified Self-efficacy for Overcoming Barriers to Exercise, modified Processes of Change for Exercise, and Social Influence on Exercise. The specific aims and related statistical analyses were described as the following:

Aim 3: To evaluate internal-consistency reliability of the six measures.

To address Aim 3, the data were analyzed by Reliability Analysis of SPSS version 11.5. The internal-consistency reliability is concerned with the homogeneity of the items within a scale. Spector (1992) suggested that multidimensional measures should be analyzed for internal-consistency indexes separately for each scale unless it makes conceptual sense to do so. In this study, internal-consistency reliability was evaluated at scale level. To demonstrate internal-consistency reliability, the values of inter-item correlation (IIC), item-remainder coefficient (IRC), and Cronbach's coefficient alpha (α) were taken into consideration.

The IIC and IRC are correlation coefficients obtained by using the Pearson product-moment correlation. IIC is the relationship among all items of each measure. It is important to evaluate in scale development because the degree of heterogeneity of the observed score (item scores) has an impact on reliability. A good item should measure different aspects but reflect similar meaning of the respective scale. An item-remainder coefficient (IRC) is a correlation of each item with the sum of the remaining items. The items with high IRC have more variance relating to what the items have in common and add more to the test's reliability than the items with low r-values. The items with high r-values demonstrate more variance in what the items measure than those items with the

low values. This study hypothesized that all relevant items of a scale intercorrelated and each item related to others as a whole. The criterion for item selection was any value in a range of .30-.79 (Nunnally & Bernstein, 1994). Those items with high coefficients were retained. However, the values that were greater than .90 were examined for redundancy with other items and considered for item shortening (Polit & Hungler, 1999). In addition, negative values of IRC demonstrate that possibly the item was ambiguous, or was inappropriate for the population. The items with negative IRC were reexamined for item meaning and possible deletion.

The coefficient alpha value is based on inter-item correlation (Cronbach, 1951). The coefficient alpha value relies on the number of items and their magnitude of intercorrelation. A scale is able to have a good coefficient alpha value by increasing either the number of items or their intercorrelation. These issues were taken into consideration in alpha interpretation. According to Nunnally and Bernstein (1994), an alpha value of at least 0.7 was determined for a scale to demonstrate internal consistency. The coefficient alpha criteria are shown in Table 8. An assumption was that an internally consistent scale had high inter-item correlations. This implied that a set of items measured the similar content and logically represented the latent variable. Those items with high coefficients were ones that should be retained. In summary, the values of inter-item correlation (IIC), item-remainder coefficient (IRC), Cronbach's coefficient alpha, and Cronbach's coefficient alpha if item deleted were considered simultaneously with the findings of Aim 2 -4 for item selection.

Table 8: *Criteria for Item Retention or Elimination*

Criteria	Values
Cronbach's Alpha	<.6 → Unacceptable .6 -.65 → Undesirable .65 -.7 → Minimally acceptable .7 -.8 → Respectable .8 -.9 → Very good >.9 → Should consider shortening
Inter-item correlation	.3 -.7 → Acceptable range
Item-remainder coefficient	.3 -.79 → Acceptable range
Item Difficulty	.3 -.7 → Acceptable range Values closed to 0 or 1 → eliminated
Item Discrimination	Positive sign → Acceptable > or = .3 → Acceptable range .1 - .29 → Undesirable range <.1 → eliminated
Factor Loading	Critical values >2 → Acceptable significant path at p<.05 Standardized regression weight >.4

Aim 4: To evaluate the variability of items in each measure.

To address Aim 4, item difficulty values were calculated. The item-difficulty index (ID_{if}) demonstrates the proportion of the participants who endorsed an item. Each patient's score on the items of the Modified Processes of Change for Exercise, Modified Decisional Balance for Exercise, Modified Self-efficacy to overcoming barriers for Exercise, and Social Influences for Exercise was recoded into two groups: endorsed and unendorsed groups. The scores were recoded as follows:

1) Modified Decisional Balance for Exercise with 5-point Likert scale. The endorsed group had a score of 3 or 4 (very important to completely important).
2) Modified Processes of Change for Exercise with 5-point Likert scale. The endorsed group had a score of 3 or 4 (often to repeatedly).
3) Modified Self-efficacy for Overcoming Barriers for Exercise with 5-point Likert scale. The endorsed group had a score of 3 or 4 (very confident to completely confident).
4) Social Influences for Exercise with 5-point Likert scale. The endorsed group had a score of 3 or 4 (often to repeatedly).

The item difficulty scores were standardized and were used to demonstrate distribution of items. The ID_{if} score of 0.3 - 0.7 was acceptable (Allen & Yen, 1979). An item difficulty score of either over .90 or close to 0 meant that people responded in the same direction; therefore, this item would provide no fine discrimination among

participants' trait levels and could not improve a scale's psychometric properties. The items with either high or low endorsement rates were eliminated.

Aim 5: To evaluate whether an item discriminates between those patients who had high scores and those who had low scores on the respective scale as a whole.

To address Aim 5, item discrimination index (ID_{is}) was computed. IDI was calculated by the formula (Allen & Yen, 1979, p. 122). The scale scores were not exactly normally distributed but were flatter than a normal curve; therefore, it is optimal to use 33% of the patients with the highest scale scores as the upper range and the 33% of the patients with the lowest scale scores as the lower range (Kelley, 1939). An ID_{is} equal to .2 or less was considered as a criterion to possibly eliminate the item. Other criteria were seriously evaluated to retain the item (See Table 8). Items with values of less than .1 were eliminated.

Aim 6: To confirm the hypothetical constructs within each measure based on the Transtheoretical Model of Change and the original measures.

To address Aim 6, confirmatory factor analysis was performed by Structural Equation Modeling. Based on the Transtheoretical Model of Change and Social Influence concept, the researcher hypothesized the four models and tested for their validity given the sample data. Confirmatory factor analysis of Structural Equation Modeling is a powerful statistical analysis that permits evaluation of substantive theory (Hoyle & Smith, 1994). In each measure, hypotheses of construct validity were:

1) The number of factors that emphasized the responses to items on observer ratings was consistent with the theoretical definition of the construct.

2) Each item had a nonzero standardized path coefficient on a specific factor that corresponds with the theoretical definition of the construct, and zero standardized path coefficients on all other scales.

3) The contribution of the factors to the items of each measure met the goodness-of-fit criteria (See Table 9).

4) The measurement error terms were uncorrelated.

5) The all scales of each measure were correlated to each other.

To evaluate the validity of the measures with regard to their theoretical constructs, confirmatory factor analysis with maximum likelihood estimation using Amos 4.0 was used. The number of factors was guided by the constructs of the original measures and the recommended indices of fit. There are two factors of Decisional Balance for Exercise (Nigg et al., 1998), six factors of Social Influence on Exercise (Chogahara, 1999), ten factors of Exercise Processes of Change (Nigg et al., 1999), and six factors of Self-efficacy for Overcoming Barriers to Exercise (Benisovich et al., 1998).

Several goodness-of-fit measures were applied to estimate how well a Confirmatory Factor Analysis Model fits with the data. The Chi-square test, Minimum Discrepancy per Degree of Freedom (CMIN/DF), the Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), the Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA), Hoelter's Critical N at .05 and .01 were used to estimate model fit for this study.

Table 9: *Criteria for Model Fit Indexes*

Criteria	Values
Chi-square	No statistical significance at p >.05 → Satisfactory fit of the model Significant → Determined by other indexes
Chi-square/df	<3
Joreskog and Sorbom's Goodness-of-Fit (GFI) and Adjusted GFI (AGFI)	>.9 → Satisfactory fit of the model
Comparative Fit Index (CFI)	>.9 → Satisfactory fit of the model
Root Mean Square Residual (RMSR)	<.05 → Acceptable residual of the model .06 → On average OK = or >.1 → Poor fit

The hypothesis of chi-square was that the discrepancy between the observed and predicted covariance was equal to zero. The larger the probability of the chi-square test, the better the fit of the model with the data. Statistical significance of the chi-square test means that the model does not fit the data well. However, (Hu & Bentler, 1995) stated that significant chi-square may be "a reflection of model misspecification, power of the test, or violation of some technical assumptions underlying the estimated method." Therefore, this study also determined chi-square results by looking at a value of the chi-square/degrees of freedom (MIN/DF). A smaller ratio indicates a model with better-fit model. The acceptable value of MIN/DF is less than 3.

The GFI, AGFI, and CFI are comparative fit indexes that reflect how well a hypothesized factor model fits with either variance correlated or the data relative to the null model no common factors. Hu and Bentler (1995) stated that the GFI and AGFI are absolute indexes of fit because they compare the hypothesized model with no model. The GFI measures the relative observed variances and covariances accounted for by the model. The AGFI is adjusted by the degree of freedom in the specified model. The values range from 0 to 1 with values of .90 or greater considered acceptable fit. Both indexes underestimate their asymptotic values with small sample size and dependent latent variates. The CFI is the comparative fit index that compares a hypothesized model with the independent model (all correlations among variables are zero). CFI takes the noncentrality parameter and sample size into the account. The CFI ranges from 0 to 1 with values of .9 or greater indicating acceptable fit.

The last two indexes were RMSEA and Hoelter's Critical N. RMSEA value indicates the difference between the predicted and observed covariance and is insensitive to degrees of freedom. The values range from 0 to 1 and higher scores indicate poorer fit. The values less than 0.05 indicate good fit and those greater than .1 indicate unacceptable poor fit. Hoelter's Critical N estimates an adequate sample size of a hypothesized model to represent the sample data. It presents adequate of sample size in order to analyze a model but the model fit. It is a critical Z values at .05 and .01 probability levels. A value greater than 200 indicates adequate the sample size of a data set is satisfactory.

Path significance was based on the critical ratio (CR), which is the t-value. The CR value tested the null hypothesis that the parameter value was equal to zero; therefore, the absolute value of greater than 2 was considered significant to keep the path. This was based on significant critical ratio of 1.96 at $p < .05$ and of 2.586 at $p < .01$. The path coefficients of lambda, gammas, and betas were reviewed. The researcher hypothesized that all standardized path coefficients would exceed .4 and critical ratio of 2 for all path coefficients were considered statistically significant at $p < .05$. The statistical significance of path coefficients provides evidence supporting the convergent validity of the indicators (Anderson & Gerbing, 1984). Squared Multiple Correlation (SMC) for each dependent measured variable was calculated to demonstrate the proportion of variance in the item accounted for by the common factor. A SMC, as the estimate of reliability, should be at least .50. In addition, path coefficients, variances of latent variables, modification indices, and asymptotically standardized residuals were considered for model modification

Modification indices indicate the minimum magnitude by which the overall likelihood ratio χ^2 value for the model would decrease if the corresponding parameter were freed (MacCallum, Roznowski, & Necowitz, 1992). The size of the modification indices was interpreted relative to the chi-square for the model. If asymptotically standardized residuals are greater than 3, modification must be made to the model in order to improve the χ^2 fit as well as the CFI and other fit indices. Interpretation of the data from confirmatory factor analysis relied principally on a conceptual rationale. It is important to note that any changes made in this study mainly take the meaning of the theoretical construct and Thai culture into account.

In summary of Aims 3-6, all findings of these tests were taken simultaneously into the consideration of item retention or deletion. A particular item elimination or retention was based principally on the criteria and theoretical framework under cultural perspective. The final measurement models were reevaluated for internal-consistency reliability coefficient and construct validity. Afterward, the Aim 7 and 8 for the final five measures was completed.

Aim 7: To evaluate known-groups construct validity of all five final measures across the Exercise Stages of Change.

To address Aim 5, a series of ANOVA tests was conducted with the follow-up test of Bonferroni-corrected alpha level. All assumptions of ANOVA test were tested as described in Data management section. The known-groups validity demonstrates that a scale can differentiate participants of one group from another. The known-group was identified by responses on Exercise Stages of Change measure. There were five stages

(Precontemplation, Contemplation, Preparation, Action, and Maintenance stages). Some studies combined the five stages into three stages: no intention of exercise, having intention of exercise, and regular exercise. The three stages were recoded from the five stages: No intention (Precontemplation stage), having intention (Contemplation and Preparation stages), and regular exercise (Action and Maintenance). The mean scores of each final scale were computed from cases who responded more than 75% of data on the scale.

Hypothesis of mean differences of each scale across the Exercise Stages of Change was at least mean of a stage was different from others at $p < .05$. If ANOVA test was significant, a follow-up test of Bonferroni-corrected alpha level would be performed. The adjusted alpha was used in order to reduce the Type I error risk. The mean scores of modified CHAMPS questionnaire, PROS of Exercise, Modified Processes of Change for Exercise, Modified Self-efficacy for Overcoming Barriers for Exercise, and Positive Social Influences in each exercise stage of change were compared by using pairwise comparison method. The significant differences across the five and three stages at $p < .01$ support known-groups construct validity.

Aim 8: To demonstrate standardized mean differences of the five final scale scores across Exercise Stages of Change.

To address Aim 8, effect sizes of mean difference were computed across the stages. The modified CHAMPS questionnaire, PROS of Exercise, Modified Processes of Change for Exercise, Modified Self-efficacy for Overcoming Barriers for Exercise, and Positive Social Influences will be applied as outcome measures for further study. As

known about effect of variability in the data to interpretation of mean difference, standardized estimates of effect size were computed to demonstrate the magnitude of mean difference. The effect size is a scale free value and uses pooled standard deviation to decrease the effect of variability difference between two groups. That demonstrates taking the standard deviation of individual scores in the population into the consideration.

The effect size of mean difference (d-index) is a way to quantify standardized difference of means between two groups. This study is based on the Transtheoretical model focusing on difference of people across five stages of change. It is significant to demonstrate that scores from each measure can differentiate mean differences across the stages. Comparison of raw means does not demonstrate the magnitude of mean difference. This study compared the means between Precontemplation and Contemplation groups, Contemplation and Preparation groups, Preparation and Action groups, Action and Maintenance groups, and Maintenance and Preparation groups. The pattern of comparison was based on positive linear relationship from no intention to exercise of Precontemplation stage to Exercise. In addition, based on difference across stages, the Contemplation and Preparation were not evidently separated because the difference between these two is the duration to change. The mean differences for all measures were also compared for the three stage groups: no intention of exercise, having intention of exercise, and exercise.

Cohen (1977, p. 23) provides a guideline to determine if an effect size value is small, medium, or high. Table 10 presents Cohen's guideline. In addition, the three criteria of effect size must be met: the minimum effect size value is .2, zero cannot be

Table 10: *Cohen's Principle of Effect Size for Mean Differences Between Two Groups*

Effect Size Interpretation	Effect Size
Small	.2
Medium	.5
Large	.8

included in the effect size confidence interval, and the lower or upper effect size confident interval is greater than .01.

Human Subjects

Approval for this study was obtained from the Institutional Review Board of Oregon Health & Science University. Permission to conduct research was obtained from the Institutional Review Boards of the two hospitals in Thailand (See Appendix D). The researcher explained to all eligible participants the purpose of the study,

characteristics of the questionnaires, participation procedure, duration, risks and discomforts, benefits, alternatives, confidentiality, costs (none), liability, and the individual right to participate and withdraw any time without any consequence to her/his treatments from the hospitals. In addition, the researcher described the length of all questionnaires and the significance of reflecting their thoughts about exercise to future direction of exercise research program. Signed informed consent was obtained before participation in the study. Once the informed consent was obtained, the study process proceeded. The consent forms are presented in Appendix E.

All inclusion criteria are important in order to target the population of interest and decrease other confounding factors (e.g. misunderstanding of questions because of reading ability, and severity of diseases). The risk to the subjects participating in this study was low. Participants volunteered their time while waiting for a doctor-scheduled appointment. The self-report questionnaire took 50-90 minutes to complete whereas the waiting time was 2-3 hours. The participants took their time to answer questions and were able to take a break or stop answering the questionnaires at any time. The risk of

participant burden was minimized by statements of appreciation at the end of some questionnaires, describing the participants' right to stop participation at any time without providing reasons to the researcher, and using 14-point font size for all questionnaire texts.

For Phase I participation, the duration of answering questionnaires and participation in focus group discussion was approximately 1.5 - 2 hours. Beverages, fruits, and snacks were served to participants after they finished responding to all questionnaires.

A code number on the questionnaires was applied to protect confidentiality. During screening for eligible participants, a tag was placed in front of his/her medical records and a hospital staff contacted potential subjects to ascertain his/her willingness to talk to the researcher. No information was recorded from the medical records.

Participants were informed that they were not identified by name or other identifying data in any published reports of this research. In addition, their questionnaires and responses were not shared with their health care providers and family members. All hard copies of questionnaires and notes were kept in a locked file cabinet, which only the researcher and dissertation committee could access. All signed consent forms were kept in a separated locked location.

CHAPTER 4: RESULTS

Phase I: Content Validity Evaluation Phase

Phase I of this study consisted of two sections: Phase Ia: Content validity from experts and Phase Ib: Content validity from four focus groups of participants with CAD diagnosis. Phase I results are presented under those two headings.

Phase Ia: Content Validity From Experts

Seven experts evaluated the content validity and clarity of each item in the questionnaires, following the guidelines for content validity sheet (See Appendix C). Four questionnaires were evaluated on the content relevance of each item and its related scale, item uniqueness of each sub-scale, and the clarity of the item's meaning in Thai cultural context. These four questionnaires included the modified Decisional Balance for Exercise (DBE), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Processes of Change for Exercise (PCE), and Social Influences on Exercise (SIE). The Community Healthy Activities Model Program for Seniors Activities Questionnaire for Older Adults (CHAMPS) was evaluated on clarity and completeness of the activity list. In addition, the Exercise Stages of Change Questionnaire was evaluated on the clarity of the exercise definition. The numbers of items and percent agreement between the seven raters of each questionnaire are presented in Tables 11-14.

Tables 11-14 present content validity from the seven experts. The findings of content validity demonstrated that the content validity index (CVI) of all four questionnaires was equal to 1. All items were rated as representative of the target content domains. 71% to100% of the raters agreed on the uniqueness of all items. For Decisional

Table 11: *Content Validity of Decisional Balance for Exercise From Seven Experts*

	# items / concepts	CVI	Item uniqueness # items agreed		Item clarity # items agreed					
% of agreement			100%	85.7%	100%	85.7%	71.4%	57.1%	42.8%	14.3%
# of experts agreed			7 of 7	6 of 7	7 of 7	6 of 7	5of 7	4 of 7	3 of 7	2 of 7
DBE	16/2	1	13	3	4	8	1	1	1	1
PROS	8	1	8	-	3	2	-	1	1	1
CONS	8	1	5	3	1	6	1	-	-	-

Table 12: *Content Validity of Self-efficacy for Overcoming Barriers of Exercise From Seven Experts.*

	# items / concepts	CVI	Item uniqueness # items agreed			Item clarity # items agreed		
%of agreement			100%	85.7%	71.4%	100%	85.7%	71.4%
# of experts agreed			7 of 7	6 of 7	5 of 7	7 of 7	6 of 7	5of 7
SEOBE	23/6	1	22	1	-	19	3	1
Negative Affect	4	1	4	-	-	4	-	-
Excuse Making	5	1	1	1	-	4	-	-
Must Exercise Alone	3	1	4	-	-	2	1	-
Inconvenient to Exercise	4	1	4	-	-	2	1	1
Resistance from Others	3	1	4	-	-	3	1	-
Bad Weather	4	1	4	-	-	4	-	-

Table 13: *Content Validity of Processes of Change for Exercise From Seven Experts*

	# items / concepts	CVI	Item uniqueness # items agreed			Item clarity # items agreed				
% of agreement # of experts agreed			100% 7 of 7	85.7% 6 of 7	71.4% 5 of 7	100% 7 of 7	85.7% 6 of 7	71.4% 5of 7	57.1% 4 of 7	42.8% 3 of 7	14.3% 2 of 7
PCE	40/10	1	31	8	1	17	12	5	5	-	1
Consciousness Raising	4	1	2	2	-	1	2	1	-	-	-
Dramatic Relief	4	1	2	1	1	-	3	-	-	-	1
Self-reevaluation	4	1	3	1	-	3	-	1	-	-	-
Environmental Reevaluation	4	1	4	-	-	1	-	-	3	-	-
Social Liberation	4	1	4	-	-	1	2		1	-	-

Table 13 (continued) *Content Validity of Processes of Change for Exercise From Seven Experts.*

	# items / concepts	CVI	Item uniqueness # items agreed			Item clarity # items agreed			
Percent of agreement # of experts agreed			*100%* 7 of 7	*85.7%* 6 of 7	*71.4%* 5 of 7	*100%* 7 of 7	*85.7%* 6 of 7	*71.4%* 5of 7	*57.1%* 4 of 7
Counterconditioning	4	1	4	-	-	2	-	2	-
Helping relationship	4	1	2	2	-	2	2	-	-
Reinforcement management	4	1	4	-	-	2	-	1	1
Self-liberation	4	1	2	2	-	4	-	-	-
Stimulus control	4	1	4	-	-	1	3	-	-

Table 14: *Content Validity of Social Influence on Exercise From Seven Experts*

	# items / concepts	CVI	Item uniqueness # items agreed			Item clarity # items agreed		
Percent of agreement # of experts agreed			100% 7 of 7	85.7% 6 of 7	71.4% 5 of 7	100% 7 of 7	85.7% 6 of 7	71.4% 5of 7
Social Influence on Exercise	27/6	1	19	8	-	18	8	1
Companionship Support	5	1	5	-	-	5	-	-
Informational Support	5	1	1	4	-	4	1	-
Esteem support	5	1	5	-	-	2	3	-
Inhibitive Behavior	4	1	2	2	-	-	4	-
Justifying Behavior	4	1	4	-	-	3	-	1
Criticizing Behavior	4	1	2	2	-	4	-	-

Balance for Exercise, Self-efficacy for Overcoming Barriers to Exercise, Social Influence on Exercise questionnaires, all items had agreement of 85.7% or higher in item uniqueness. 97.5% of Processes of Change for Exercise items had at least 85.7% agreement of item uniqueness; only one item, "I get upset when I realized that people I love would have better health if they exercise" had only 71.4% agreement. Two experts agreed that this item was similar to an item of "I get upset when I see people who would benefit from exercise but choose not to exercise." However, the meaning of the item may have a different degree of emotional affect to on different people. This item was tagged for item uniqueness. All items were justified to keep for further analysis in term of content validity concern because of CVI values and item uniqueness findings.

Clarity demonstrates how understandable each item is for Thais. Language is an important issue. Ranges of percent agreement among the four questionnaires were 14.3-100%. The significant aspects of clarity were comprehensibility and appropriateness of language for Thais population. For example, some words may not have exactly same meaning in general Thai language tradition with exercise such as "experience", "try to think", "more energy for family and friends", "positive outlook on life", "companionship", "embarrassed", "upset", "prevent me from", and "respect." Items with cause-effect items were rearranged. If-cause items were rearranged in order to make more sense for Thai people.

All seven experts agreed with the list of activities in the CHAMPS questionnaire in term of completeness and clarity. They suggested including some activities such as cooking, watching television, washing clothes by hand, chatting with friends at coffee

place, or reading a newspaper at community place. Based on the purpose of this study, the included activities should be physical activities mainly and nonphysical activities only for reducing social desirability for inactive people. It was also a limitation of caloric expenditure calculation of this study; the MET value of washing clothes by hand was not established by the CHAMPS research team. The researcher decided to maintain the 37 activity items and will consider adding more activity items based on the frequency analysis on the item of "other" activities in the Phase II.

The items that had agreement of 71.4 and lower were changed following their comments and discussion with two experts related to language clarity. Those items were tagged and reconsidered to change corresponding to findings of four focus groups.

Phase Ib: Content Validity From Population of Interest

Four focus groups were conducted at two hospitals. The two exercise focus groups were conducted at the Rehabilitation Center at Ramathibodi Hospital and two non-exercise groups were conducted at the Central Chest Hospital. Each groups had approximately 9-10 participants. The time average to answer the questionnaire packet was 55 minutes with the range of 35 -90 minutes. The focus-group discussions ranged from 30 minutes in non-exercise group to 60 minutes in the exercise groups. The criterion to delete or change specific items was greater than 30% of the participants having difficulty answering the items. If more than two groups identified an agreement on deleting a specific item because it was not applicable for them, then the item was deleted. For clarity, the researcher worked with two experts to change the problematic items following the focus groups' findings and experts' suggestions.

In the first exercise group, the researcher found that the group was dominated by three participants. It was difficult for some participants to share their thoughts to strangers such as other participants and the researcher. The other three focus groups demonstrated difficulties in expressing or critiquing the questionnaires. One possible reason was that they were asked at the hospitals; it was understandable that they were under the pressure of a health care setting. Based on the observation, the researcher randomly talked individually with other participants after the group discussion.

Overall, all focus groups complained about the length of questionnaire packet. To decrease response errors on a particular questionnaire, the order of five questionnaires was changed every 100 cases (CHAMPS, DBE, SEOBE, PCE, and SIE). In addition, Exercise Stages of Change was always the first and the SF-36 and demographic data sheet were the last. To present appreciation of all participants' time and efforts, the researcher created a statement for all participants of phase II before he/she signed his/her consent form. The statement was the following:

"Before you decide to participate in this study, I would like to let you know that this is a long questionnaire packet. We recognized that it is not easy to exercise regularly. To understand exercise behavior, this questionnaire packet has many items attempting to assess possible thoughts and activities related to exercise of CAD patients. Whether exercising or not, we would like to learn your thinking of exercise. I understand that answering all these questions may take at least 50 minutes or longer than that. This presents a lot of efforts that you are going to put in for this project. Your effort will provide excellent information for health care provider to develop a good measure for future exercise intervention study for CAD patients."

When focus groups were asked to comment on perceptions of item clarity, approximately fifty percent of participants in each groups said the items were understandable and some items provided different perspectives of exercise that they

never thought of including famous people advertise themselves about exercise, exercise instead of a nap or watching television, and self-commitment to exercise. Bilingual participants of the focus groups stated that some items needed to be revised so that the sentences would be more like Thai language practice in general.

Two non-exercise focus groups demonstrated some difficulties in answering these questionnaires. Five of them stated that "I have nothing to fill because I did not intend to exercise. I do nothing about this." And two participants said "I know I should do exercise but I have many things to do and want you as a health care professional to understand. That why I decided to answer these questions." Based on this evidence, the researcher instructed each participants of Phase II how to respond in each questionnaire, especially non-exercise participants, and randomly checked their responses after they returned their questionnaires to the researcher for Phase II.

The instructions for the DBE were not clear. These focus groups acknowledged that exercise has only benefits for them. They became confused with the first sentence of instruction: "This section looks at positive and negative aspects of exercise." This statement raised a question of which one is positive or negative. They recommended the researcher to state what they have to answer to make the introduction short and unambiguous. The first sentence was deleted and the new instruction is the following:

> "Read the following items and indicate how important each statement is with respect to your decision to exercise or not to exercise in your leisure time by filling in the appropriate circle. Please answer using the following 4-point scale"

The item of "Exercise prevents me from spending time with my friends" was discussed in four focus groups in term of language meaning. This item had clarity of

85.7% from seven experts. Two experts suggested change this item to "Exercise decreases the time that I can spend with my friends." All four focus groups discussed this statement and they agreed with the changing. The Thai wording of "embarrass" were changed to "feel uncomfortable" with agreement of four focus groups. In addition, the Thai word meaning "companionship" was changed to lay words of "have more friends to do other activities together."

For the Processes of Change for Exercise questionnaire (PCE), the word "experience" in introduction of the questionnaire was terminology for general population. The focus groups asked what the experience means exactly. An expert recommended from her experience in research that this word should be changed to "have you either thought or done this thing in the last month". The focus groups agreed with the new phrase. The researcher changed following the suggestion.

The item of "Shown their respect for your versatility in an exercise?" had 15 participants recommended to change for better Thai language. The "respect" word gave a meaning in a sense of "show honor to". This word may not appropriate to exercise behavior. Two experts also agreed to change; they and the researcher agreed to change "respect" to "praise" word. In addition, some minor changes were made to be more Thai language tradition of Thais in general; the original meaning of each item was retained. The word of "try to think of" is not common to use in Thai language. Two participants from exercise groups and four participants from non-exercise groups said that it was not common Thai language practice. Their groups agreed to change these words to "think."

All focus groups had the same comment regarding the PCE questionnaire. When they read through the items of Processes of change for Exercise questionnaire, they would like to do more exercise because each item provided different points of view to encourage them. Exercise Stages of Change and CHAMPS questionnaire did not have any suggestions from the four focus groups.

Self-Efficacy for Overcoming Barriers to Exercise questionnaire (SEOBE) presented some similar barriers such as "I am alone" and "I have to exercise alone", and "My exercise partner decides not to exercise that day." The focus groups suggested if it is possible to delete some in order to make this questionnaire shorter. They said "it gave us a lot of information to think about exercise. Is that possible to make it shorter than this and still gave good information?" This information was taken into account for item deletion for Phase II. Many participants stated "they have no family problem in their life, no travel, or no regular working schedule, how do they answer their confidence related to these barriers?" The researcher asked them back what they did on their responses. They responded the same in that they have completely confidence to overcoming these barriers because they were able to manage their life well enough to not having these barriers. The researcher confirmed this idea with the focus group and they agreed with it. The researcher put a statement in the introduction of SEOBE that "If you did not have a specific barrier that means you have completely confidence to overcoming the barrier." As a result of this finding, the researcher randomly checked participants' responses of this questionnaire in Phase II.

No comments were made on any specific item of the Social Influence for Exercise questionnaire. Some participants personally mentioned to the researcher that the items that posted negative feeling of exercise from their friends or family may not get accurate answers because everyone knows that exercise is good for their heart function. They said "people might have some friends say that but you know it was impossible to say that repeatedly." A participant asked, "Why you have to know this? Just help us to have more positive supports and then negative thoughts of their family or friends will be gone. I did not see the exercise program that had family involvement."

The four focus groups stated that the CHAMPS questionnaire is not only exercise activities but also all daily activities. A woman stated, "I did not go exercise but filled this questionnaire make me feel like I did some exercise. I am always doing things in my house or out in the yard. My daughter said I am never going to sit down and rest. I am always thinking of something to do." Many participants responded the same in that they were active in their household work and had no time to exercise. Most Thai women or retired people take their responsibilities of household work to help their adult children. They do not think about exercise but they were physically active from taking care of their house.

In summary, no item was deleted based on findings of content validity that all items met criteria of lesser than 30% of the participants having difficulty to answer the items, content validity index (greater than .85) and item uniqueness (agreement of 70% or higher) for the final questionnaire. The only changes made corresponding to experts' suggestions and four focus groups' finding were wordings to gain more understanding in

Thai language. The final Thai version of Exercise Questionnaire Packet for Coronary Artery Disease Patients is presented in Appendix B.

Phase II: Psychometric Property Evaluation Phase

Of the 495 participants with coronary artery disease diagnosis from Central Chest Institute and Ramathibodi Hospital who consented to be in the study, 412 participants completed all six questionnaires: the Community Healthy Activities Model Program for Seniors (CHAMPS), Decisional Balance for Exercise (DBE), Processes of Change for Exercise (PCE), Self-efficacy for Overcoming Barriers of Exercise (SEOBE), Social Influence for Exercise (SIE), and Exercise Stages of Change (ESC). Subjects with incomplete questionnaire packages (16%) were excluded from the study. Because demographic questions were contained in the last questionnaire, most of the incomplete responses lack the information that would be needed to demonstrate differences between those who participated in the study and those who did not.

Of the 412 participants, 276 participants were from the Central Chest Institute (67%) and 136 participants from the Ramathibodi Hospital (33%). Approximately 62% of the sample was obtained from medical clinics and 38% from surgical clinics. Tables 15 and 16 present sample characteristics across the hospitals. A series of Chi-square tests and t-tests were performed to examine differences between hospitals. Participants of the Central Chest Institute were significantly older than those of Ramathibodi Hospital ($t_{410} = 2.20$, $p < .05$). There were no significant differences in education and income levels between participants from the two hospitals. The number of chronic illnesses was not significantly different between participants from the two hospitals.

Table 15: *Sample Characteristics by Hospital*

Sample characteristics	*M (SD)*	
	Central Chest Institute	Ramathibodi Hospital
Age	62.7 (8.71)	60.72 (8.22)
	$t_{410} = 2.20, p < .05$	
Number of chronic illnesses	2.64 (1.45)	2.75 (1.13)
	$T_{410} = .79, p > .05$	
Body Mass Index	24.87 (3.32)	25.77 (3.84)
	$t_{400} = 2.41, p < .05$	

Table 16: *Sample Characteristics by Hospital.*

Characteristics	Number of patients (%)	
	Central Chest Institute	Ramathibodi Hospital
Education	$\chi^2_{(6)} = 9.45, p > .05$	
No formal education	3 (1.1)	5 (3.7)
Elementary school	70 (25.8)	26 (19.1)
High school	62 (22.9)	33 (24.3)
Vocational training	28 (10.3)	14 (10.3)
College	16 (5.9)	8 (5.9)
Bachelor degree	75 (27.7)	33 (24.3)
Graduate	17 (6.3)	17 (12.5)
Income	$\chi^2_{(3)} = .647, p > .05$	
Not enough	23 (8.4)	10 (7.4)
Enough but no saving	84 (30.5)	46 (34.1)
More than enough and having some savings	118 (42.9)	54 (40)
Have certain amount of saving	50 (18.2)	25 (18.5)

Data Screening and Missing Data Management

Double data entry was used to verify all data. Comparison of the two files demonstrated an error rate of less than seven percent. Less than 1% of the errors were coding errors. Most of the errors occurred from file transfer errors such as entering 0 instead of missing data. All discrepancies between two files were corrected so that the final data set has no errors. After general screening of all data, missing data analysis by SPSS version 11.5 was performed in order to examine the patterns of missing items. At the item level, 93.45%, 97.33%, 99.76%, 92.23%, 94.66%, and 96.12% of the items were complete for the SF-36, Social Influences for Exercise, CHAMPS, Processes of Changes for Exercise, Decisional Balance for Exercise, and Self-efficacy for Overcoming Barriers of Exercise, respectively. Participants were expected to respond to at least 85% of all items in each measure. Cases with missing data greater than 15% of each measure were excluded from analyses with that measure. Based on this criterion, three cases of the 412 participants were excluded from analysis of related measure (SEOBE =1: SF-36 = 2).

After deleting the three cases, missing data patterns of each measure were explored at both scale and item levels. Each scale had less than 5% missing data. The tabulated patterns of missing data suggested that missing data was missing at random (MAR) for the items of each scale. No particular item was consistently missing and no clear patterns of missing existed. At the item level, each item had less than 3 percent missing data. It is of note that an item on the Decisional Balance for Exercise scale "Exercise put an extra burden on my significant others" was answered by some participants without partners or spouses. Of the 2.9% of missing, 0.17% were married.

The response of this item included responses from 11.8% of the single, divorced or separated, and widowed participants. 80.85% of participants rated this item as not important at all. T-test confirmed no mean differences for this item between married and unmarried groups.

Because the study aim was to validate measures, it is important to maintain variability in the scores. Therefore, mean substitution was not used for missing data at the item or scale levels. Item analyses included only cases with complete data in each scale. Summed score for each scale were computed for those with at least 75% of the item. After item analysis, the mean of each scale was computed from available item responses of participants who responded at least 75% of the scale. Each measure was tested for normality, and outliers. Violations of assumptions for specific analyses also were tested.

Demographic Characteristics and Health Conditions

Table 17 summarizes demographic information for the total sample. Table 18 and 19 present body mass index, height, weight and health condition information. The mean age of the participants was 62.04 + 8.59, with 42% age 55-64.9 years and 29.9% age 65-74.9 years. Sixty percent of this sample was older than 60 years of age. The majority of the participants were male (83.7%), married/cohabitant (86.2%), living with both spouse and their children (53.2%), and retired or unemployed (54.9%). Socioeconomic status was identified by education and income. Approximately 25% had finished elementary school or lower and 34.7% finished bachelors degree or higher. Ninety-two percent of the sample reported that they had at least adequate income. The majority of the participants

Table 17: *Demographic Variables*

Variables	Frequency	Percent
Age		
45-49 years	30	9.3
50-54 years	32	10
55-59 years	65	20.2
60-64 years	76	23.7
65-69 years	65	20.2
70-74 years	29	9
75 years and older	24	7.5
Gender		
Female	67	16.3
Male	345	83.7
Marital Status		
Divorced/separated	12	2.9
Married/cohabitant	355	86.2
Single	15	3.6
Widowed	30	7.3
Education		
No formal education	8	2.0
Elementary school	96	23.6
High school	95	23.3
Vocational training	42	10.3
College	24	5.9
Bachelor degree	108	26.5
Graduate	34	8.4

Table 17. (continued)

Variables	Frequency	Percent
Income		
Not enough	33	8.0
Enough but no savings	130	31.7
Enough and having savings	172	42.0
Have certain amount of savings	75	18.3
Living with		
Alone	10	2.4
Children	51	12.4
Spouse	101	24.5
Spouse and children	219	53.2
Spouse and other relatives	20	4.9
Other relatives	7	1.7
Others	4	1.0
Working Status		
Retired or unemployed	224	54.9
Employed	181	44.4
Housekeeper	3	.7
Body Mass Index		
Underweight	2	.6
Normal	140	43.6
Overweight	134	41.7
Obese	45	14.0

Table 18: *Body Mass Index, Height, and Weight of Participants*

Variable	*N*	Min	Max	*M*	*SD*
Body Mass Index	402	17.65	37.46	25.17	3.52
Height (m)	402	1.45	1.83	1.65	.07
Weight (kg)	411	42.0	102.0	68.3	10.9

Table 19: *Distribution of Chronic Illnesses in Participants With Chronic Illnesses*

Chronic Illnesses	Frequency	Percent
Arthritis	61	14.8
Asthma	23	5.6
Chronic bronchitis or emphysema	17	4.1
Depression	12	2.9
Diabetes Mellitus	140	34.0
Chronic renal disease	8	1.9
Hyperthyroidism	6	1.5
Hypothyroidism	4	1.0
Heart failure	25	6.1
High blood pressure	235	57.0
Irregular heart beat	106	25.7
Coronary artery disease	409	99.3
Stroke	26	6.3
Cancer	4	1.0
Alcoholism	0	0
Gastrointestinal disease	26	6.0

were on a low fat diet and approximately 94% of the sample reported that they had not smoked during the last six months.

Body Mass Index (BMI) values were categorized into 4 categories: Underweight (<19), Normal (19-24), Overweight (25-29), Obese (Sarkin et al., 2001) (See Table 17). Approximately 55% of participants were at least overweight. BMI was negatively correlated with age ($r = -.25$, $p < .01$). However, BMI mean did not differ for male and female. Table 19 presents the frequencies of chronic illnesses of the sample. Approximately 31% of the subjects had 2 types of chronic illnesses and 27%, had 3 types. All participants had a confirmed diagnosis of coronary artery disease by clinical evidence (as mentioned in inclusion criteria for participation of this study). However, three participants did not select CAD (coronary artery disease) as their chronic illness. The error was .7%. The most common chronic illnesses of participants with CAD were hypertension (57%), diabetes (34%), arrhythmia (25%), and arthritis (14.8%).

In the following section, the findings of the reliability and validity of the six measures are presented.

Physical Activity

Physical activity was assessed with two measures: Exercise Stages of Change (ESC) and Community Healthy Activities Model Program for Seniors (CHAMPS). These measures provided information related to leisure activities and their intention to exercise regularly. The stage distribution is presented in Table 20. The Maintenance stage of ESC had the largest percentage of subjects (33.6%). However approximately 45% of participants with CAD did not exercise regularly. Responses to the CHAMPS

Table 20: *Frequency of Exercise Stages of Change*

Exercise stages of change	Frequency	Percent
Five Stages ($n = 411$)		
Precontemplation	43	10.5
Contemplation	61	14.8
Preparation	81	19.7
Action	88	21.4
Maintenance	138	33.6
Three Stages ($n = 411$)		
No intention	43	10.5
Have intention	142	34.5
Exercise regularly	226	55.0

questionnaire showed that ten out of 412 participants did not participate in any physical activities.

Description

Tables 21 and 22 provide the physical activity information from the CHAMPS measure. The two most frequent non-physical activities were "Read" (86.7%) and "Visit with friends or family" (62.9%). The most frequent physical activities were related to housework: light work around the house (82.3%), walk to do errands (76.7%), and light gardening (74.3%). At the moderate level of physical activity, the most frequent activity was walk fast or briskly for exercise (57.3%). In contrast, twelve activities had less than 10% of participants participating. These were dance (7.5%), play golf without cart (4.1%), and play golf by riding a cart (3.2%), shoot pool or billiards (3.6%), play double tennis (3.6%), play singles tennis (1.5%), do aerobic machines such as rowing, or step machines (do not count treadmill or stationary cycle) (6.6%), water exercises (1.2%), swimming (3.2%), yoga or Tai-Chi(8%), aerobics or aerobic dancing (7.8%), and basketball, soccer, or racquetball (1.9%). All items of the CHAMPS were checked by someone and all items were retained.

Caloric expenditure is estimated from a formula with body weight as one of the major multiplier. The higher weight a person has the higher caloric expenditure value would be estimated. The mean and standard deviation of caloric expenditure from all physical activities was 3571.99 ± 2903.24. One person appeared extremely active with total caloric expenditure of all physical activities of 20,405.70 Kilocalories /week. This was a male aged 47 years old and weight of 82 kilograms falling in the obesity class of

Table 21: *Summary of Leisure Physical Activities*

Activity	*Frequency*	%
At Least Moderate Level		
Do water exercises	5	1.21
Play single tennis	6	1.46
Play double tennis	6	1.46
Play basketball, soccer, or racquetball	8	1.94
Play golf, riding a cart	13	3.16
Swim gently	13	3.16
Play golf, carrying or pulling your equipment	17	4.13
Do other aerobic machines such as rowing, or step machines	27	6.55
Dance	31	7.52
Do aerobics or aerobic dancing	32	7.77
Do yoga or Tai-chi	33	8.01
Do moderate to heavy strength training	59	14.32
Do stretching or flexibility exercises	67	16.26
Do general conditioning exercises	78	18.93
Work on your car, truck, lawn mower, or other machinery	95	23.06
Do light strength training	98	23.84
Do heavy gardening	114	27.67
Ride a bicycle or stationary cycle	121	29.37
Jog or run	141	34.22
Do heavy work around the house	217	52.67
Walk fast or briskly for exercise	236	57.28
Lower than moderate level		
Walk leisurely for exercise or pleasure	280	67.96
Do light gardening	306	74.27
Walk to do errands	316	76.70
Do light work around the house	339	82.28

Table 22: *Summary of Leisure Non-Physical Activities*

Activity	*Frequency*	%
Non-physical activity		
Shoot pool or billiards	15	3.64
Play a musical instrument	34	8.25
Take part in church activities	58	14.08
Play cards, bingo, or board games with other people or children	60	14.56
Do volunteer work	66	16.06
Go to the senior center	79	19.17
Use a computer	87	21.12
Attend other club or group meetings	90	21.84
Do woodworking, needlework, drawing, or other arts, or crafts	109	26.46
Attend a concert, movie, lecture, or sport event	130	31.55
Visit with friends or family	259	62.86
Reading	357	86.65

BMI. He was in the action exercise stage of change, and has been active for less than 6 months. His heavy weight resulted in a higher estimated caloric expenditure per week than a person with lighter weight performing the same amount of activities.

Construct validity

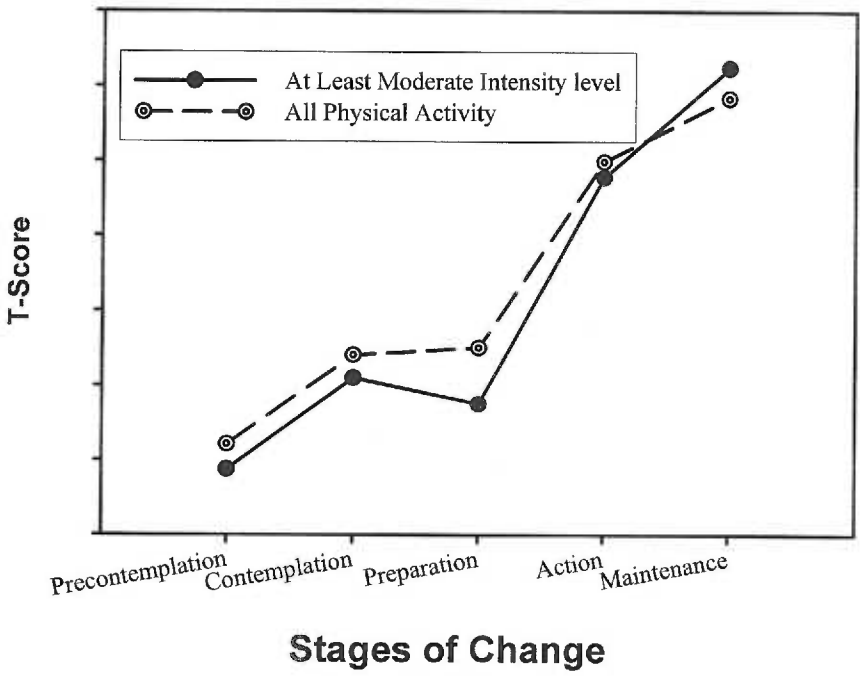
To demonstrate relationship between caloric expenditure computed from a list of activities of CHAMPS measure and intention to exercise assessed by Exercise Stages of Change, a series of one-way ANOVAs with Bonferroni post-hoc was performed. The hypotheses tested whether participants with higher stages would have higher caloric expenditure of physical activities. Table 23 presents the descriptive analysis of caloric expenditure from both activity types across the stages. The ANOVA findings indicated that there were significant differences in caloric expenditure during all physical activities ($F_{4, 396} = 13.41$, $p < .001$) and those engaging in moderate to vigorous physical activities ($F_{4, 360} = 17.87$, $p < .001$) among the 5 stages. The post-hoc test demonstrated no significant differences among Precontemplation, Contemplation, and Preparation stages or between Action and Maintenance stages at $p > .05$. However, significant differences between two major groups, Action and Maintenance versus Precontemplation, Contemplation, and Preparation, were found at $p < .01$. Figure 3 demonstrates standardized t-score of caloric expenditure from both activity types across the five stages.

Many studies based on the Transtheoretical Model of Change restructured the stages into three stages: no intention, having intention to exercise regularly, and exercise regularly. As hypothesized, the ANOVAs demonstrated significant mean differences in caloric expenditure during all physical activities ($F(2, 398) = 25.97$, $p < .001$) and in

Table 23: *Physical Activity Caloric Expenditure in Each Exercise Stages of Change*

Total caloric expenditure(kcal)/week	Exercise Stages of Change	*N*	*M*	*SD*	95% *CI*		Min	Max
					Lower	Upper		
All physical activities	1. Precontemplation	43	1951.97	1753.26	1412.40	2491.54	334.69	7585.40
	2. Contemplation	58	2648.18	2284.27	2047.56	3248.79	344.53	10914.75
	3. Preparation	78	2704.93	1866.01	2284.21	3125.65	95.55	11193.66
	4. Action	88	4146.13	3259.66	3455.47	4836.78	355.56	20405.70
	5. Maintenance	134	4638.33	3188.42	4093.53	5183.14	184.80	14083.19
Physical activities of at least moderate level and above	1. Precontemplation	28	906.71	1135.00	466.61	1346.82	66.15	4465.13
	2. Contemplation	51	1437.34	1669.90	967.67	1907.00	86.63	6541.50
	3. Preparation	72	1285.44	1103.58	1026.11	1544.77	95.55	6837.60
	4. Action	88	2596.59	2372.30	2093.95	3099.23	72.45	16014.60
	5. Maintenance	126	3229.10	2318.83	2820.26	3637.95	91.35	10271.10

Figure 3: Linear Plot of the T-score of Total Energy Expenditure Across Exercise Stages of Change



those moderate to vigorous physical activities ($F (2, 362) = 32.73$, $p < .001$) across three stages and the post-hoc tests demonstrated the group having regular physical activity had significantly higher caloric expenditure than the other two groups at $p < .01$. No difference was found between no intention and have intention, as expected.

Effect size

The standardized mean differences of the two caloric expenditure scores between the Exercise Stages of Change provide an effect size estimate. Tables 24 and 25 present effect size of caloric expenditure mean differences between higher and lower Exercise Stages of Change for all types of physical activity and at least moderate level, respectively. For all types of physical activities and at least moderate level, effect sizes of comparing between Action and Preparation stages were medium (.58 and .69, respectively) while those between Maintenance and Precontemplation stages were large (.92 and 1.08, respectively). In addition, when the stages were categorized into three stages, there were small, medium, and large effect sizes when comparing between no intention and intention stages, intention and exercise stages, and exercise and no intention stages, respectively (See Tables 24 and 25).

The effect sizes comparing between Contemplation and Precontemplation and between Maintenance and Action of both types of physical activities were approximately small. It needs to be noted that the 95% confidence intervals of these effect sizes included zero. Overall, the caloric expenditure of both types of physical activity demonstrated good properties for an outcome measure of change across stages.

Table 24: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of All Physical Activity Caloric Expenditure*

Scale/ Stages of Change	Higher Stage of Change Group			Lower Stage of Change Group			SDEF	*CI* for Effect Size	
	M	*n*	*SD*	*M*	*n*	*SD*		Lower	Upper
All Physical Activities									
Con & Pre	2648.18	58	2284.27	1951.97	43	1753.26	0.34	-0.06	0.73
Prep & Con	2704.93	78	1866.01	2648.18	58	2284.27	0.03	-0.31	0.37
Act & Prep	4146.13	88	3259.66	2704.93	78	1866.01	0.53	0.22	0.84
Main & Act	4638.33	134	3188.42	4146.13	88	3259.66	0.15	-0.12	0.42
Main & Pre	4638.33	134	3188.42	1951.97	43	1753.26	0.92	0.56	1.28
Soint & Noint	2680.73	136	2046.93	1951.97	43	1753.26	0.37	0.02	0.71
Ex & Soint	4443.22	222	3218.55	2680.73	136	2046.93	0.62	0.40	0.84
Ex & Noint	4443.23	222	3218.55	1951.97	43	1753.26	0.82	0.49	1.15

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise; SDEF = Standardized Effect Size; CI = 95% Confidence Interval.

Table 25: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Physical Activities of at Least Moderate Level and Above*

Scale/ Stages of change	Higher Stage of Change Group			Lower Stage of Change Group			SDEF	*CI* for Effect Size	
	M	*n*	*SD*	*M*	*n*	*SD*		Lower	Upper
Physical activities of at least moderate level and above									
Con & Pre	1437.34	51	1669.90	906.71	28	1135.00	0.35	-0.11	0.81
Prep & Con	1285.44	72	1103.58	1437.34	51	1669.90	-0.11	-0.47	0.25
Act & Prep	2596.59	88	2372.30	1285.44	72	1103.58	0.69	0.36	1.00
Main & Act	3229.10	126	2318.83	2596.59	88	2372.30	0.27	0.00	0.54
Main & Pre	3229.10	126	2318.83	906.71	28	1135.00	1.08	0.64	1.50
Soint & Noint	1348.42	123	1362.82	906.71	28	1135.00	0.33	-0.08	0.74
Ex & Soint	2969.01	214	2356.16	1348.42	123	1362.82	0.79	0.56	1.02
Ex & Noint	2969.01	214	2356.16	906.71	28	1135.00	0.92	0.51	1.32

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise; SDEF = Standardized Effect Size; CI = 95% Confidence Interval.

Concurrent validity

Table 26 shows the correlations of the two caloric expenditure scores with age, BMI, and eight scales of health related quality of life measure. The findings are consistent with other cross-sectional studies that demonstrated significant relationships between physical activities and some aspects of health-related quality of life (Koltyn, 2001; Stewart et al., 2001). The correlations between two caloric expenditures of physical activities and Physical Functioning, General Health, Vitality, and Mental Health were small in magnitude. All types of physical activity and the at least moderate intensity level of physical activity demonstrated negative small correlations with age (See Table 26). No significant correlations with Bodily Pain scale were found. The significant positive correlations between caloric expenditure during all physical activities and moderate to vigorous physical activities and the Physical Health, Vitality, and Mental Health scales of SF-36 accounted for 2% to 5% of the variance. These low correlations were acceptable because they did not measure the same concepts but their significant relationships were well-known by previous studies. The concurrent validity of modified CHAMPS questionnaire was marginal acceptable.

Decisional Balance for Exercise (DBE)

Based on the Transtheoretical Model of Change, the Decisional Balance for Exercise measure has two scales: Pros and Cons. The Decisional Balance for Exercise is 16-item measure with eight items in each scale. Of the 412 subjects, 408 provided complete responses on the Pros scale and 394 on the Cons scales.

Table 26: *Correlations Among Caloric Expenditure per Weeks, Number of Physical Activity Types per Week, Five Scales of Health-Related Quality of Life, and Age*

Measure and Scale	CE/wk of All PA		CE/wk of All PA at least MI	
	r	*N*	*r*	*N*
Health-Related Quality of Life (SF-36)				
Physical functioning	.20**	400	.22**	364
Bodily pain	.03	400	.04	364
General health	.17**	400	.14**	364
Vitality	.23**	400	.21**	364
Mental health	.13*	400	.13*	364
Demographics				
Age (Years)	-.18**	400	-.19**	364

Note. * $p < 0.05$ (2-tailed). ** $p < 0.01$ (2-tailed). r = Pearson correlation. *N*= sample size
CE= Caloric expenditure. PA= Physical activities.
MI= At least moderate intensity level of physical activities.

Hypothesized Model Analysis

Item analysis.

Table 27 shows internal-consistency reliability coefficient, item-remainder coefficient, item discrimination, item difficulty, factor loading, and the highest modification indices of the 16-item DBE measure. Internal-consistency reliability estimates (alpha) were calculated separately for Pros and Cons scales. The coefficient alpha of the eight Pros items was .86. All item-remainder coefficients were within acceptable ranges (.38-.75). The eight items together demonstrated a good internal consistency for the Pros scale.

If items are acceptable, item difficulty values should be in the range of .30 to .70. The acceptable range indicated percentage of participants who rated a particular item very important or completely important to exercising. There were four items with good item difficulty and two items with higher ranges (See Table 27). Two items related to health improvement from exercise (stronger bones and muscles and improved heart function) were endorsed by more than 85 percent of participants; these items had less variability of responses from the sample. In terms of item discrimination, seven items were able to differentiate between high-scoring and low scoring participants on the Pros. Again, only one item related to heart function (.14) had poor item discrimination.

In summary, the Pros item analysis demonstrated good internal-consistency reliability for the scale and had acceptable variability and discrimination. The item of "I would have better heart function if I exercise regularly" demonstrated good internal consistency; however, it had very low variability and could not differentiate people who

Table 27: *Item Analysis of Decisional Balance for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor loading	Highest MI
Pros (α=.86)					
1: I would have more energy for doing activities with my family and friends if exercised regularly.	0.67	0.64	0.72	0.73	4.26
3: I would feel less stressed if I exercised regularly.	0.55	0.56	0.66	0.61	-
5: I am in a better mood after exercising.	0.71	0.63	0.74	0.78	-
7: I would feel more comfortable with my body if I exercised regularly.	0.75	0.53	0.80	0.83	6.14
9: Regular exercise would help me have a more positive outlook on life.	0.74	0.57	0.78	0.82	6.32
11*: I would have stronger bone and muscles if I exercised regularly.	0.66	0.36	0.86	0.73	9.69
13*: I would have better heart function if I exercised regularly.	0.55	0.14	0.94	0.59	7.63
15*: Exercise helps me to have more friends to do other activities together.	0.38	0.61	0.45	0.41	7.01
Cons (α=.74)					
2: I would feel embarrassed if people saw me exercising.	0.49	0.18	0.06	0.58	-
4: Exercise decreases my time that I can spend with my friends.	0.44	0.16	0.06	0.53	7.21
6: I feel uneasy in exercise clothes.	0.48	0.13	0.04	0.54	5.66
8: There is too much I have to learn to exercise.	0.32	0.58	0.38	0.38	19.63
10: Exercise puts an extra burden on my significant other.	0.57	0.28	0.09	0.68	10.91
12*: I am too shy to exercise with other people.	0.37	0.07	0.03	0.44	17.28
14*: I would get pain or discomfort from exercise.	0.43	0.25	0.09	0.50	4.77
16*: My health concerns prevent me from exercise.	0.46	0.27	0.10	0.56	8.47

Note. * Added items. IRC = Item-remainder coefficient; ID_{is}= Item discrimination; ID_{if}= Item difficulty; MI = Modification indices.

had high and low Pros score. In other words, almost all participants responded in the same way for this item. However, for the population of interest, this item is clinically relevant and was retained in the Pros scale.

The Cons had an internal-consistency reliability coefficient of .74. Item-intercorrelation values were low ranging from .09 to .47 with a mean of .38. Item difficulty analysis revealed that seven items on the Cons scale had only 10 percent or fewer of participants who rated these items as very important or completely important to decide to exercise regularly (See Table 27). The Cons items also demonstrated fair to poor item-discrimination. Only one item, "There is too much I would have to learn to exercise" demonstrated good variability and discrimination (See Table 27). The item analysis implied that the participants may not have negative attitudes or may not express their negative attitudes towards exercise. Thai people have a difficult time expressing negative feelings about either themselves or others. In the four focus groups, participants said that exercise is a good thing to do, however they were less likely to say anything negative about exercise. The restricted range of responses seen in the questionnaire supports the focus group finding. The item analysis supports the notion that the Cons scale is not applicable for Thai people.

Construct validity.

The sample size for the confirmatory factor analysis for the DBE was 390. The ratio of cases to unknown parameter of the Decisional Balance for Exercise measure was good at approximately 12:1. A hypothesized 2-factor measurement model was tested to

determine whether the 16 items adequately represented Pros and Cons scales. The factor loadings and the highest modification indexes for each item are presented in Table 27.

All sixteen factor loadings were significant on the hypothesized factor based on critical ratios greater than 2. All factor loadings of Pros items were greater .6 except for a value of .41 on an item of "Exercise gives me companionship with others". Overall items of the Pros scale loaded adequately on their corresponding latent variable. Six of the items on the Cons scale had factor loadings in the range of .50- .68 (See Table 27). Two other items loaded poorly (.38 and .44). In general, the loading for the Cons scale were smaller than the Pros scale.

All items loaded in the hypothesized direction and on the hypothesized factor. Higher scores on these items were associated with positive attitudes toward exercise. In contrast, the positive relationships among the Cons items and the Cons factor mean that higher scores on these eight Cons items imply more negative attitudes toward exercise. The correlation between the Pros and Cons factors was not significant based on the critical value less than 2.

All squared multiple correlations (SMC) illustrated that the variance explained in the items by the factors ranged from .14 to .69. No item of Cons had SMC greater than .5 which is considered an acceptable level (SMC range = .15 - .47) while 5 items of Pros had SMCs greater than .5 (SMC range = .53 -.69). Although the other three items had less variance explained in the item by the Pros factor (SMC range = .17 -.35), these items either were clinically relevant or had good item discrimination. The highest modification index for the Pros scale was less than 10 which was small in comparison to the model

chi-square. In summary, the hypothesized paths between each item and related factors were more strongly confirmed for the Pros scale than the Cons scale.

Model evaluation.

Table 28 presents the goodness-of-fit indexes of the Decisional Balance for Exercise Models. Overall the hypothesized factor model chi-square was significant ($\chi^2_{103} = 257.62$, $p < .001$); however, this test is extremely sensitive to sample size. Therefore, other goodness of fit indexes were considered as well. The ratio of the chi-square value to the degrees of freedom was less than three. The goodness-of-fit index was greater than .85 the suggested value but GFI adjusted for degree of freedom was less than .9 accepted value. In addition, the Root Mean Square Error of Approximation was within the acceptable level of .07 (RMSEA = .06). These numbers indicated a fair fit of the model with the data. Overall, a two-factor model still did not fit extremely well with the data.

A second model dropping the Cons scale also was tested. The Pros scale demonstrated good variability, discrimination, internal consistency, and factor loading while the Cons were in question. However, out of eight items, seven items of Cons scale had extremely low item difficulty and poor discrimination that limited the variance of the items (see Table 27) and low factor loadings. Therefore, the eight items of Cons scale were dropped from further analyses in this study.

Final Model Confirmatory Factor Analysis

Because the Thai participants with CAD in this study decided to exercise or not depending primarily on the positive aspects of exercise (PROS), the researcher will use the name PROS of Exercise as a measure name for the final measure. To demonstrate the

Table 28: *Goodness-of-Fit Indexes of Confirmatory Factor Analysis Models*

Measure (*n*)	χ^2	df	CMIN/DF	GFI	AGFI	CFI	RMSEA
Decisional Balance for Exercise (390)							
Hypothesis model	257.62	103	2.5	.92	.89	.92	.06
Final Model	49.57	20	2.49	.97	.94	.98	.06
Self-efficacy for Overcoming Barriers of Exercise (396)							
Hypothesis model	722.76	215	3.3	.86	.83	.93	.08
Social Influence for Exercise (401)							
Hypothesized model	1031.56	309	3.34	.83	.79	.86	.08
Final Model	278.28	87	3.2	.91	.87	.94	.07
Processes of Change for Exercise (380)							
Hypothesized model	2058.82	695	2.96	.78	.74	.84	.07
Model 1: Original	873.37	360	2.41	.87	.83	.92	.06
Model 2: Final model	829.48	360	2.30	.88	.84	.93	.059

Note. χ^2= Chi-square; df = Degree of freedom; CMIN/DF = Chi-square/ degree of freedom ratio; GFI = Goodness-of-Fit Index; AGFI = Adjusted Goodness-of-Fit Index CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

construct validity of PROS for Exercise, confirmatory factor analysis with one factor was tested. In addition, construct validity was evaluated across the five and three Exercise Stages of Change. A series of ANOVA and effect size calculations were performed.

The remaining eight items of the PROS for Decisional Balance of Exercise scale were re-analyzed in a single factor confirmatory factor analysis. The chi-square was significant ($\chi^2_{20} = 49.57$, $p < .001$) with the model's chi-square per degree of freedom ratio was good ($\chi^2/df = 2.48$). In addition, CFI, NFI GFI and AGFI were greater than .9 (See Table 27). The RMSEA demonstrated good model fit with a value of .06. Overall, the final model of PROS confirmed a good fit with data.

Effect size.

To examine mean scores of the PROS across the five and three Exercise Stages of Change, an ANOVA was used. Table 29 shows the mean, standard deviation, number of participants with CAD in each group. The findings demonstrated that mean scores on the PROS were significantly different across the five and three stages ($F_{4, 406} = 40.53$, $p < .001$; $F_{2, 408} = 78.91$, $p < .001$, respectively). The post-hoc tests of five stage comparisons demonstrated that the Precontemplation stage had significantly lower mean score on PROS than the other four stages at $p < .05$. While the Maintenance had significant higher mean score on PROS than the other stages except the Action stage (See Table 29). The Preparation stage had no significant mean differences with the Contemplation and Action stages. The comparison of sequential stages from the Contemplation to Maintenance demonstrated no significant mean differences.

Table 29: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of PROS of Exercise*

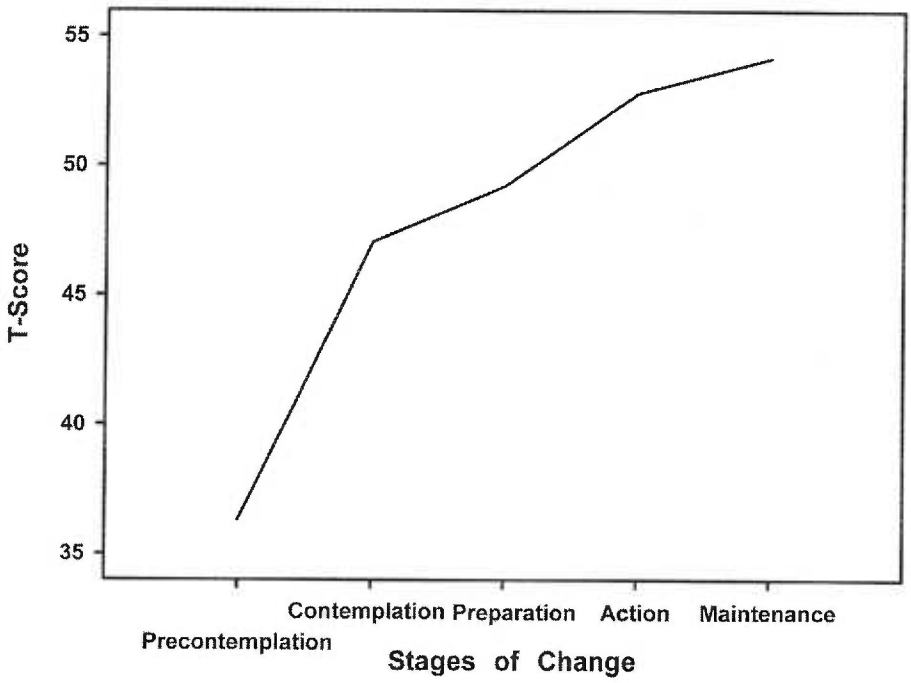
Stages of change	Higher stage of change group			Lower stage of change group			SDEF	*CI* for effect size	
	n	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Con & Pre	61	2.72	0.84	43	1.88	0.95	0.95	0.52	1.34
Prep & Con	81	2.89	0.62	61	2.72	0.84	0.24	-0.10	0.57
Act & Prep	88	3.16	0.57	81	2.89	0.62	0.45	0.15	0.76
Main & Act	138	3.27	0.53	88	3.16	0.57	0.20	-0.07	0.47
Main & Pre	138	3.27	0.53	43	1.88	0.95	2.13	1.71	2.52
Soint & Noint	142	2.81	0.73	43	1.88	0.95	1.18	0.81	1.54
Ex & Soint	226	3.23	0.54	142	2.81	0.73	0.68	0.46	0.89
Ex & Noint	226	3.23	0.54	43	1.88	0.95	2.17	1.78	2.53

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise;
SDEF = Standardized Effect Size; CI = 95% Confidence Interval.

Across the three stages, the post-hoc tests demonstrated that the group having regular physical activity had significant higher mean score on PROS than the other two groups at $p < .05$ To provide a standard metric, the PROS scores were converted into t-scores. Figure 4 demonstrates standardized t-score of PROS across the five stages. The graph demonstrates that t-scores of PROS increased gradually from Precontemplation to Maintenance stage, consistent with the Transtheoretical Model of Change. It is significant to note that PROS t-score from Precontemplation to Contemplation stages increased more than 15 points or 1 standard deviation. It is consistent with the progress across stages based on the Transtheoretical model.

The effect sizes of PROS mean difference across five and three Exercise Stages of Change were calculated. Table 29 presents effect sizes of PROS mean difference. Results showed that participants in the lower stage scored significantly lower on the PROS than participants in higher stages with small to large mean-difference effect sizes. The PROS mean score had a large effect size in comparing the Precontemplation and Contemplation (.95). The PROS mean score had a small effect size when comparing the Contemplation and Preparation stages and the Action and Maintenance stages. It needs to be noted that the 95% confidence interval of these effect size values included zero. When the stages were categorized into three stages (no intention, have some intention, and exercise regularly), the values demonstrated moderate to large effect sizes of the PROS mean differences (See Table 29).

Figure 4: Linear Plot of the T-score of PROS of Exercise Scale Across Five Stages of Change



In conclusion, the Decisional Balance for Exercise measure had only one factor with eight items. This measure demonstrated a different sub-concept from the theoretical framework. The final measure, renamed PROS of Exercise, demonstrated good internal-consistency reliability, item variability, construct validity from factor construct and Exercise Stages of Change group differences.

Self-efficacy for Overcoming Barriers of Exercise (SEOBE)

The SEOBE measure had 23 items on six scales, including Negative Affect, Excuse Making, Exercising Alone, Inconvenient to Exercise, Resistance from Others, and Bad Weather. Of the 411 subjects, 396 completed responses on the SEOBE measure without any missing data. All 13 items of Negative Affect, and Bad Weather had no missing data. There was 1% or less missing data in the remaining 10 items, including 4 for Excuse Making, 1 for Must Exercise Alone, 4 for Inconvenient to Exercise, and 1 for Resistance From Others. All participants provided more than 95% of data. Some items were skewed with their standardized skewness less than one.

Hypothesized Model Analysis

Item analysis.

Table 30 shows internal-consistency reliability coefficient, item-remainder coefficient, item discrimination, item difficulty, factor loading, and the highest modification indices of the 23-item SEOBE measure. Internal-consistency reliability estimates (alpha) of each scale were in the range of .83 to .92. Inter-item correlations of each scale were in the range of .49-.88. All item-remainder coefficients were in the acceptable range of .3 to .79 (See Table 30). The six scales of SEOBE demonstrated

Table 30: *Item Analysis of Self-efficacy for Overcoming Barriers of Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Negative affect (α=.92)					
1: I am under a lot of stress.	0.78	0.91	0.41	0.81	-
2: I am depressed.	0.88	0.98	0.37	0.94	-
3: I am anxious.	0.88	0.97	0.38	0.94	-
4*: I feel too old.	0.74	0.88	0.49	0.79	8.45
Excuse making (.89)					
5: I feel I do not have the time.	0.73	0.75	0.38	0.78	5.21
6: I do not feel like it.	0.76	0.69	0.34	0.82	-
7: I am busy.	0.77	0.77	0.39	0.80	8.46
8*: I feel physical discomfort or pain when I exercise.	0.70	0.76	0.38	0.75	-
9*: I am experiencing personal or family problems.	0.71	0.75	0.38	0.79	11.49
Must exercise alone (.87)					
10: I am alone.	0.74	0.89	0.55	0.81	-
11: I have to exercise alone.	0.77	0.87	0.58	0.81	-
12: My exercise partner decides not to exercise that day.	0.75	0.98	0.45	0.86	-

Note. * Added items. **Modified items. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 30: (continued) *Item Analysis of Self-efficacy for Overcoming Barriers of Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Inconvenient to exercise (.83)					
13: I do not have access to exercise equipment.	0.61	0.85	0.50	0.74	11.38
14**: I am away from home often.	0.63	0.82	0.44	0.67	-
15*: Transportation is not convenient.	0.73	0.88	0.38	0.80	-
16*: The environment is not safe.	0.67	0.87	0.33	0.78	-
Resistance from others (.9)					
17: My friends do not want me to exercise.	0.83	0.96	0.46	0.92	-
18: My family does not want me to exercise.	0.83	0.97	0.48	0.89	-
19: I am spending time with friends or family who do not exercise.	0.76	0.94	0.40	0.81	-
Bad weather (.89)					
20: It is raining.	0.71	0.54	0.19	0.73	5.09
21**: It is hot outside.	0.71	0.71	0.32	0.74	30.56
22*: There is air pollution outside.	0.82	0.64	0.21	0.89	4.64
23: The roads or sidewalks are slippery.	0.84	0.62	0.20	0.92	-

Note. * Added items. **Modified items. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

good internal consistency. The item difficulty values for most of the items were .32 to .58, which is in the acceptable range of .3-.7 (See Table 30). However, the three items of the Bad Weather scale had marginal acceptable difficulties, including "It is raining" (.19), "The roads or sidewalks are slippery" (.20), and "There is air pollution outside" (.21). The findings indicated that few participants were able to overcome these barriers. The meanings of these items imply participants' health concerns of getting sick or falling. It was clinically relevant that the proportions of participants who endorsed these items were lower than the acceptable value. Nevertheless, the item discrimination suggested that each item was able to discriminate very well between the participants with high total scores on the related scale and those with low total scores (See Table 30). Based on these considerations, even these three items had low item difficulty; they demonstrated good internal consistency and item discrimination. Therefore, the items were retained for further analysis.

Construct validity.

The sample size for the confirmatory factor analysis for the SEOBE was 396 with the ratio of cases to estimated parameters of 6:1. A hypothesized six-factor model of SEOBE was tested to determine whether the 23 items adequately represented their respective six scales: Negative Affect, Excuse Making, Must Exercise Alone, Inconvenience to Exercise, Resistance from Others, and Bad Weather. Their factor loadings and modification indices are presented in Table 30. All twenty factor loadings were significant on the hypothesized factors based on critical ratios greater than 2 at $p < .05$. All items of SEOBE measure loaded well on their corresponding factors in the

range of .67 to .94. All squared multiple correlations illustrated that the variance explained in the items by the factors were ranged from .45 -.88 with acceptable level of .5. The highest modification indices for the SEOBE were 30 or less, which was small in comparison to the model chi-square and made no theoretical sense. These findings confirmed good construct validity of this measure.

Overall, the six scales of SEOBE demonstrated good variability, discrimination, internal consistency, and factor loadings. Even though three items had low variability; they discriminated well between low and high scores on the Bad Weather scale and had good factor loadings. Therefore, all 23 items were retained in the final measure.

Final Model Confirmatory Factor Analysis

Model evaluation.

Six indices were used as criteria to assess the fit of the SEOBE measurement model (See Table 28). Overall the hypothesized six factor model chi-square was significant ($\chi^2_{215} = 722.76$, $p < .001$) with the CMIN/DF was greater than 3, acceptable value (See Table 28). GFI and AGFI were less than .9, which is the acceptable value (See Table 28). CFI as a measure of the comparison to a baseline model taking the non-centrality parameter into consideration was greater than suggested value .93. The RMSEA was greater than .07 accepted value indicating a marginal fit between the hypothesized model and the observed data. The correlations among factors were significant in the range of .45 to .80. Overall, the fit of the data to the hypothesized model was not entirely adequate. As previously mentioned, the construct validity of this

measure was good with all significant factor loadings. Therefore, all 23 items of SEOBE were retained.

Effect size.

To examine the mean scores of 23 items of self-efficacy across five Exercise Stages of Change, an ANOVA was used. Table 31 shows the mean, standard deviation, and number of participants with CAD in each group. The findings demonstrated that self-efficacy scores were significantly different across five and three Exercise Stages of Change ($F_{4, 405} = 57.03$, $p < .001$; $F_{2, 407} = 91.74$, $p < .001$, respectively). The post-hoc test of the five and three stages demonstrated that SEOBE score differed significantly across the stages at $p < .05$. The mean scores of SEOBE increase from Precontemplation stage to Maintenance stage and from no intention group to regular exercise group. To provide a standard metric for comparison with previous research, the SEOBE scores were converted into t-scores. Figure 5 demonstrates t-score mean of SEOBE across five stages. The SEOBE scores increase across stages.

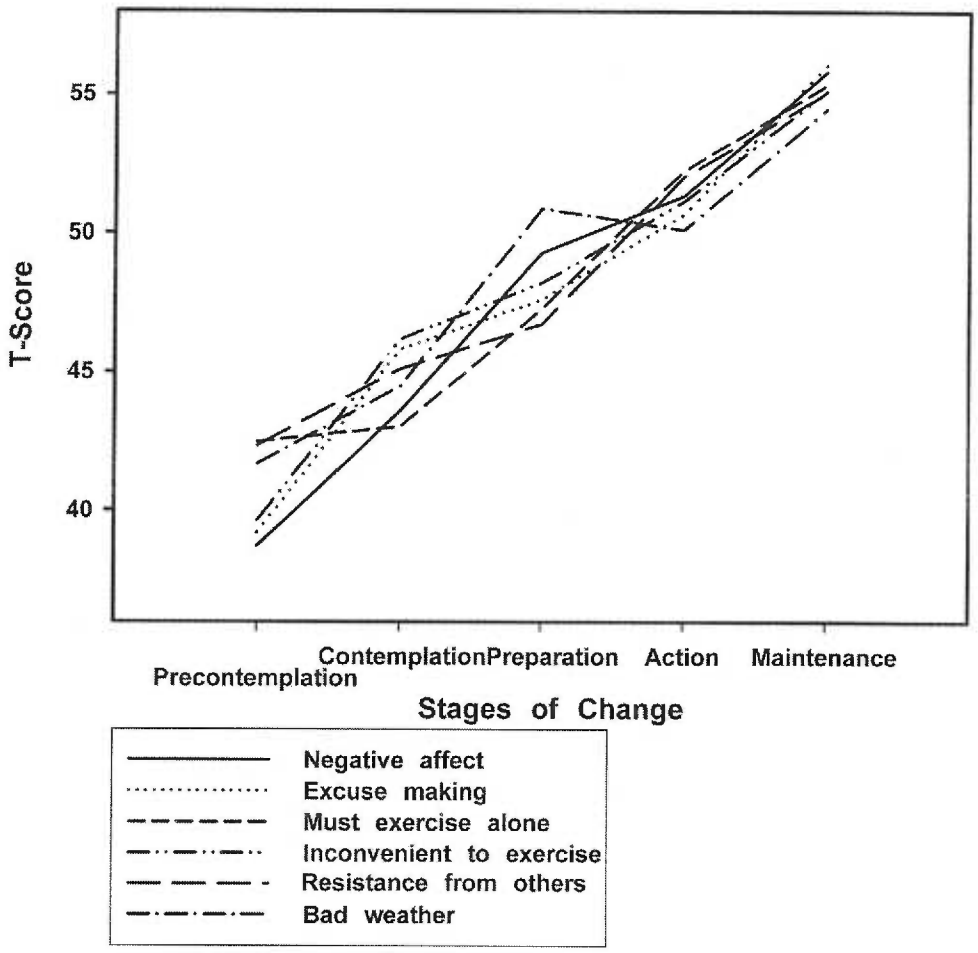
Table 31 presents effect sizes of SEOBE mean difference across five and three Exercise Stages of Change. Across the five stages, the effect sizes of SEOBE mean difference ranged from .44 to 2.24. The participants in the lower stage scored significantly lower on self-efficacy than participants in higher stages with small to large mean-difference effect sizes. The SEOBE mean scores had medium effect sizes when comparing the Maintenance and Action stages, comparing the Precontemplation and Contemplation stages, and comparing Preparation and Contemplation stages. Comparison of the Action and Preparation stages showed a small effect size. Again, it was a

Table 31: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Self-efficacy for Overcoming Barriers of Exercise*

	Higher stage of change group			Lower stage of change group			SDEF	*CI* for effect size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Con & Pre	61	1.27	0.67	43	0.78	0.62	0.76	0.35	1.16
Prep & Con	80	1.73	0.82	61	1.27	0.67	0.61	0.26	0.95
Act & Prep	88	2.11	0.92	80	1.73	0.82	0.44	0.13	0.75
Main & Act	138	2.62	0.88	88	2.11	0.92	0.57	0.29	0.84
Main & Pre	138	2.62	0.88	43	0.78	0.62	2.24	1.81	2.64
Soint & Noint	141	1.53	0.79	43	0.78	0.62	1.00	0.64	1.35
Ex & Soint	226	2.43	0.93	141	1.53	0.79	1.02	0.80	1.24
Ex & Noint	226	2.43	0.93	43	0.78	0.62	1.86	1.49	2.22

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise;
SDEF = Standardized Effect Size; CI = 95% Confidence Interval

Figure 5: Linear plot of the T-score of Self-efficacy for Overcoming Barriers for Exercise Across Five Exercise Stages of Change.



consistent finding of large effect size when comparing Maintenance and Precontemplation stages. When comparing among three stages, the effect sizes were large within a range of 1-1.86 with no zero contained in the effect size confidence interval. As hypothesized, the SEOBE scores were significantly higher for participants who exercised regularly compared to those with no intention and intention groups. Overall, the SEOBE measure demonstrated good effect size across both five and three stages.

In conclusion, the 23-item Self-efficacy for Overcoming Barriers of Exercise measure confirmed statistically for six factors. The measure had good internal-consistency reliability, item variability, construct validity from factor analysis and differences in Exercise Stages of Change.

Processes of Change for Exercise (PCE)

Hypothesized Model Analysis

A 40-item PCE measure was used to examine the 10 processes of change. These processes consist of 5 Experiential Processes and 5 Behavioral Processes. The Experiential Processes include Consciousness-raising, Dramatic Relief, Environmental Reevaluation, Self-reevaluation, and Social Liberation. The 5 Behavioral Processes include Counterconditioning, Helping Relationships, Reinforcement Management, Self-liberation, and Stimulus Control. Each scale had four representative items which include three original items and one added item using a five-point-Likert scale from zero (never) to four (repeatedly). Three hundred and eighty subjects (92%) provided complete data. There were 5% or less missing data from the remaining 32 subjects. Twenty-four of the

40 items had no missing data. The other 16 items had 1.5% or less missing data. All subjects provided at least 90% percent responses to the items in each scale; therefore, mean of each scale was calculated from the available item responses.

Item analysis.

Tables 32 and 33 present internal-consistency reliability coefficient, item-remainder coefficient, item discrimination, item difficulty, factor loading, and the highest modification indices for the items of ten scales categorized into Experiential and Behavioral Processes, respectively. Internal-consistency reliability estimates (Alpha) were calculated separately for the 10 scales. The Conciousness-raising scale assesses the efforts of participants seeking new information about exercise. The scale demonstrated very good internal-consistency reliability with a coefficient alpha of .82. All items demonstrated positive item-remainder coefficients in the acceptable range of .3-.79. However, it is of noted that if an added item of "I talk to my doctor about exercise" was deleted, the coefficient alpha increased to .86. The three original items demonstrated poor item difficulties of .17 to .23 but acceptable item discriminations of greater than .2. Although less than 25 % of the subjects endorsed these items, each item score was still able to discriminate between subjects who had high and low scores. In contrast, the added item demonstrated poor difficulty and poor discrimination (See Table 32). Therefore, the added item "I talk to my doctor about exercise" was deleted from further analysis.

The Dramatic relief scale had a marginally acceptable Cronbach's alpha of .69. The item-remainder coefficients were in the acceptable range of .34 to .56. When an item "I am afraid of the consequences to my health if I do not exercise" is deleted, the

Table 32: *Item Analysis of Experiential Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Consciousness- raising (α=.82; .86#)					
1: I read articles about exercise in an attempt to learn more about it.	0.71	0.31	0.23	0.84	-
2: I look for information related to exercise.	0.80	0.29	0.22	0.96	8.53
3: I find out about new methods of exercising.	0.64	0.23	0.17	0.69	5.83
4*: I talk to my doctor about exercise.	0.46	0.12	0.22	0.46	32.0
Dramatic relief (α=.69; .72#)					
5: I get upset when I see people who would benefit from exercise but choose not to exercise.	0.50	0.40	0.14	0.63	-
6: I am afraid of the consequences to my health if I do not exercise.	0.34	0.55	0.54	0.45	28.73
7: I get upset when I realize that people I love would have better health if they exercised.	0.56	0.78	0.29	0.74	-
8*: I worry that I may have a heart attack like my friends who do not exercise.	0.54	0.70	0.34	0.61	6.23

Note. * Added items. # Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 32. (continued). *Item Analysis of Experiential Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Environmental reevaluation (α=.88; .80#)					
9: I realize that if I do not exercise regularly, I may get ill and be a burden to others.	0.67	0.74	0.65	0.73	6.93
10: I think that my exercising regularly will prevent me from being a burden to the healthcare system.	0.70	0.74	0.70	0.77	5.15
11: I think that regular exercise plays a role in reducing health care costs.	0.63	0.78	0.62	0.71	4.25
12*: I realize that if I exercise regularly, I will be a good role model for exercise to my children.	0.62	0.70	0.72	0.71	9.81
Self reevaluation (α=.92; .89#)					
13: I feel more confident when I exercise regularly.	0.82	0.56	0.75	0.86	-
14: I believe that regular exercise will make me a healthier, happier person.	0.79	0.38	0.85	0.84	7.82
15: I feel better about myself when I exercise.	0.83	0.45	0.82	0.84	6.09
16*: I feel that I am taking care of my health when I exercise.	0.81	0.53	0.77	0.82	4.63

Note. * Added items. #Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 32 (continued) *Item Analysis of Experiential Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Social liberation (α=.79; .80[#])					
17: I have noticed that many people know that exercise is good for them.	0.57	0.53	0.77	0.69	5.73
18: I am aware of more and more people who are making exercise a part of their lives.	0.68	0.44	0.82	0.80	9.36
19: I have noticed that famous people often advertise the fact that they exercise regularly.	0.67	0.73	0.66	0.71	-
20*: I am aware of an increase in exercise activity at senior center in my community.	0.51	0.84	0.54	0.57	23.11

Note. * Added items. [#] Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 33: *Item Analysis of Behavioral Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Counterconditioning (α=.78; .78#)					
21: When I feel tired, I make myself exercise anyway because I know I will feel better afterwards.	0.62	0.84	0.45	0.74	-
22: Instead of taking a nap after work, I exercise.	0.63	0.69	0.30	0.74	-
23: Instead of relaxing by watching TV or eating, I take a walk or exercise.	0.62	0.67	0.38	0.67	4.05
24*: When I feel blue or sad, I make myself exercise.	0.48	0.53	0.18	0.51	-
Helping relationships (α=.82; .82#)					
25: I have a friend who encourages me to exercise when I do not feel up to it.	0.64	0.74	0.30	0.70	5.59
26: My friends encourage me to exercise.	0.73	0.95	0.55	0.83	-
27: I have someone who encourages me to exercise.	0.66	0.86	0.56	0.72	-
28*: I have someone to exercise together.	0.57	0.68	0.30	0.67	16.56

Note. * Added items. # Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 33 (continued). *Item Analysis of Behavioral Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Reinforcement management (α=.83; .88#)					
29: One of the rewards of regular exercise is that it improves my mood.	0.74	0.54	0.81	0.86	-
30: I try to think of exercise as a time to clear my mind as well as a workout for my body.	0.72	0.48	0.83	0.83	-
31: If I engage in regular exercise, I find that I get the benefit of having more energy.	0.72	0.44	0.84	0.81	-
32*: I like the social interaction during exercise.*	0.52	0.92	0.52	0.62	42.32
Self- liberation (α=.85; .86#)					
33: I tell myself that I can keep exercising if I try hard enough.	0.67	0.65	0.69	0.77	6.32
34: I make commitments to exercise.	0.79	0.70	0.71	0.85	4.78
35: I believe that I can exercise regularly.	0.74	0.67	0.70	0.81	5.66
36*: I have told others that I have a commitment to exercise.	0.61	0.88	0.48	0.67	7.64

Note. * Added items. # Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 33 (continued). *Item Analysis of Behavioral Processes of Change for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Stimulus control (α=.81; .79#)					
37: I use my calendar to schedule my exercise time.	0.57	0.63	0.22	0.58	-
38: I keep a set of exercise clothes conveniently located so I can exercise whenever I get the time.	0.70	0.88	0.50	0.82	-
39: I make sure I always have a clean set of exercise clothes.	0.69	0.93	0.51	0.84	-
40*: I put exercise reminders around my house.	0.58	0.61	0.22	0.62	7.51

Note. * Added items. # Coefficient alpha of final scale. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

coefficient alpha increases to .72. The item intercorrelation of this item was very low with a range of .21 to .36. In addition, the item meaning is similar to an item "I worry that I may have a heart attack like my friends who were inactive" but less specific to subjects with CAD. Three of the four items on the Dramatic relief scale demonstrated good difficulty and discrimination (See Table 32). An item "I get upset when I see people who would benefit from exercise but choose not to do" had low item difficulty of .14. Only 14 percent of participants rated high on this item.

Again, this item asks about participants' negative feeling to others' decisions. Expression of negative feelings is not common in Thai culture and this may be a possible explanation for the low variability on this item. However, this item demonstrated good item discrimination and the scale had a lower coefficient alpha when the item was deleted. Based on these considerations, the item "I get upset when I see people who would benefit from exercise but choose not to do" was retained in the final scale while the item "I am afraid of the consequences to my health if I do not exercise" was taken into consideration for possible item dropping during model evaluation.

The four items together of Environment Reevaluation scale (ER) demonstrated good internal consistency reliability with alpha coefficient of .88 and all item-remainder coefficients were within acceptable range (.3 - .79). All four items had good item difficulty within the accepted range of .3 - .7 (See Table 32). Moreover, four items demonstrated significant differences between high-scoring and low-scoring participants on the ER with the values greater than .3 of item discrimination.

The Self-reevaluation scale (SR) had an alpha coefficient of .92. Item-intercorrelation values were high ranging from .67 to .8. All item remainder coefficients were also higher than acceptable value of .79. The four items had item difficulty higher than acceptable value of .7. However, all these items demonstrated good discrimination. Overall, the four items of SR were likely to measure the same thing based on the correlations and alpha coefficient. These findings suggested that shortening the scale should be considered.

The coefficient alpha of the four Social Liberation (SL) items was .79. All item-remainder coefficients were within acceptable range (.51- .68). The four items together demonstrated good internal consistency for the SL scale. The acceptable range of item difficulty was .3 to .7; therefore, there were two items with good item difficulty and two items with slightly higher ranges (See Table 32). The higher value means these items had less variability of responses from the sample. Nevertheless, four items demonstrated good item discrimination with the acceptable values greater than .3. Overall, the four items of SL scale demonstrated good internal consistency and adequate difficulty and good discrimination properties among various response types of participants in this study.

The Counterconditioning scale (CC) had an internal-consistency reliability coefficient of .78. All Item-intercorrelation and item-remainder coefficient values of the three original items were within acceptable ranges (See Table 33). It is important to note that an added item "When I feel blue or sad, I make myself exercise" had the lowest item-remainder coefficient with a value of .48. Item difficulty analysis showed that only three original items on the CC scale had good variability. In contrast, for the added item, only

eighteen percent of respondents used this strategy often or repeatedly. However, all four items demonstrated good item-discrimination. The item analysis implied that the added item demonstrated significant difference between high-scoring and low-scoring participants while it had low variability of response.

The Helping Relationships (HR) scale had an internal consistency reliability coefficient of .82. All item-intercorrelation values were within acceptable range of .45 to .63 and all item-remainder coefficients were in the range of .57 - .73. The four items demonstrated a good internal consistency for the HR scale. All items had item difficulty values within an acceptable range of .3 to .7 and good item-discriminations of greater than .3. Therefore, the HR item analysis demonstrated good internal consistency reliability for the scale and had good variability and discrimination.

The Reinforcement Management scale (RM) demonstrated very good internal-consistency reliability with coefficient alpha of .83. Item-remainder coefficients for the four items were positive within the acceptable range of .3-.79 (See Table 33). All items could differentiate people who had high and low RM score with item discrimination values in the range of .44 -.92 but the three original items had item difficulties slightly higher than the acceptable range. Because these three items were well-known benefits of exercise, more than 80 percent of participants endorsed these items. Base on item discrimination and internal-consistency reliability, these four items were retained.

The coefficient alpha of the four Self-liberation (SL) items was .85. All item-intercorrelation values were in the range of .47 to .74. Item-remainder coefficient values were within acceptable range (.60 - 79). The four items demonstrated a good internal

consistency for the SL scale. Item-intercorrelation values were in the range of .47 -.74. Item-remainder coefficients were within an acceptable. The four items demonstrated good item difficulty and item-discrimination range (See Table 33). Overall, the SL item analysis demonstrated good internal-consistency reliability for the scale and good variability and discrimination.

Stimulus Control (SC) had an internal-consistency reliability coefficient of .81. Item-intercorrelation values were in the range of .45-.74. Item-remainder coefficient values were within acceptable ranges (See Table 33). If items have acceptable variability, item difficulty values should be in the range of .3 to .7. There were two items with good item difficulty and two items (one original item and one added item) with lower difficulty. The two items with poor item difficulty were "I use my calendar to schedule my exercise time" and "I put exercise reminders around my house". One expert provided a comment on these items that neither using calendar nor reminders were typical strategies in daily life of Thai people. However, the expert stated that they were possible strategies for people with high education. Even though these items had low variability, they could differentiate between people who had high and low SC scores. The SC item analysis demonstrated that these two items could be considered for deletion from further analysis.

In summary, overall item analysis of 40 items of ten scales of the PCE demonstrated good internal-consistency reliability, acceptable item difficulty and discrimination. This scale is somewhat a long questionnaire and it should be noted that the coefficient alpha for each scale would have been slightly higher if the added items

were eliminated. The added items include "I am aware of an increase in exercise activity at senior center in community" (Social liberation), "I like the social interaction after exercise" (Reinforcement management), "I have told others that I have a commitment to exercise" (Self-liberation). This was taken into consideration during model evaluation.

Construct validity.

A hypothesized ten-factor model of PCE was tested to demonstrate that the 40 items adequately corresponded to their respective ten scales based on the Transtheoretical Model of Change. The factor loadings and modification indices are presented in Tables 32 and 33. The sample size for confirmatory factor analysis was 380. The ratio of cases to estimated parameters was low at approximately 3:1. The ratio did not meet the criterion of at least 5: 1 for adequacy of sample size. However, Gorsuch (1988) suggested that at least five participants per measured variable and a sample size of at least 200 are acceptable. The ratio of subjects to the items in this study was 9.5:1. Because this study model was not a complex one; therefore, this could be considered marginally adequate.

All factor-loading paths were statistically significant with critical ratio greater than 2. The factor loadings ranged from .45 to .96. The values greater than .4 indicate that all items loaded adequately on the expected scales. The percent of variance of the ten factors was significant. The squared multiple correlation coefficients (SMC) of each item were greater than .5 except 8 added items in the range of .21 -.44. An SMC as the estimate of reliability should be at least .50. There were added items in Conscious-raising (.21), Dramatic Relief (.37), Social Liberation (.33), Counterconditioning (.26), Helping

Relationships (.45), Reinforcement Management (.39), Self-liberation (.44), and Stimulus Control (.38). Eight items out of ten added demonstrated poor reliabilities.

In addition, the original item "I am afraid of the consequences to my health if I do not exercise" had the lowest SMC of .2 indicating that this item should be eliminated as well. The ten scales were significantly correlated one to the other in the range of .27 to .88 at critical ratios greater than 2. It is important to note that eight out of the ten added items demonstrated highest modification indices for crossing the loadings to other factors (See Tables 32 and 33). All items except 8 added items and one original item loaded well on their respective factors. These nine items were taken into consideration of item deletions.

Model evaluation.

The hypothesized factor model chi-square was significant ($\chi^2_{695} = 2058.82$, $p < .001$) and the ratio of chi-square to degree of freedom was 2.96. The GFI, AGFI, and CFI were below the acceptable value of .9 (See Table 28). In addition, the RMSEA was marginal within the acceptable level of .07. Overall, ten-factor model did not fit extremely well with the data.

Overall, this measurement model did not fit the data; however, all factor-loading paths were significant. The ten constructs of PCE were consistent with the Transtheoretical Model of Change. However, the item analysis demonstrated some problems with the added items and the item "I am afraid of the consequence to my health if I do not exercise." Therefore, at the item level, item deletions were considered for the final measure analysis. As mentioned previously, the possible measures based on the data

from this study were either a measure containing the 30 original items or a 30 item measure containing the 29-original items from the nine scales and the deleted item of "I am afraid of the consequence to my health if I do not exercise" from the Dramatic Relief scale.

Final Model Confirmatory Factor Analysis

Based on item analysis and confirmatory factor analysis of the hypothesized model, the two possible measurement models for the PCE were Model 1: the 30-item original measure model and Model 2: the 30-item scale of 29 original items, deletion of an original item "I am afraid of the consequence to my health if I do not exercise", and retained an added item of "I worry that I may have a heart attack like my friends who do not exercise". It is important to note that the creation of these models was data driven. Both models kept the original constructs consistent with the theoretical framework. In addition, the modification indices of the hypothesized model suggested no new paths were added. The final measure would be chosen based on better factor loadings and model fit with the data, using the model evaluation, which is described next.

Model evaluation.

Six indices were used as criteria to assess the fit of the two measurement models (See Table 28). Both the ten-factor models chi-square were significant (See Table 28) with the CMIN/DF was less than 3, acceptable value. The GFI values were nearly .9, which indicated a good model fit (see Table 28). However, the AGFI dropped to .83 and .84. Because the sample size for this measurement model was small, these two indices were not sufficiently sensitive to model misspecification, and the chi-square should be

interpreted with caution (Hu & Bentler, 1995). The CFI, which is more stable with a small sample size, was greater than .9 indicating acceptable fit (See Table 28). In addition, the RMSEA adjusted for degrees of freedom of the Model 1 and 2 were acceptable at .06. Both models demonstrated acceptable fit. There was no significant difference in model fit with the data between the two models.

For the model 1, all items on the original measure loaded well on the expected factors (.56 - .98), except the item "I am afraid of the consequence to my health if I do not exercise" which loaded at .4 on the Dramatic Relief scale. In addition, the squared multiple correlation (SMC) for this item was very low (.16). In contrast, all items in the measurement model 2 loaded well on their expected factors, ranging from .53 - .98. The SMEs for the 23 items were greater than .5 except for some items that were marginal low (.29 - .4). This was acceptable for the small sample size. It is important to note that the item "I use my calendar to schedule my exercise time" had a low SMC at .29. This item had low item difficulty at .22. This raised concerns whether using a calendar may not be applicable or only few people may apply this tool. Using a calendar for a daily schedule is common in American daily living, but is uncommon in Thailand. Using calendar for scheduling is becoming more common in younger Thai with high level of education, however, the item had good discrimination and there was no increase in coefficient alpha if this item was deleted. Therefore, the item was retained.

In conclusion, the model 2 was selected as a final PCE model. The final PCE measure of ten scales with three items on each scale demonstrated good internal-consistency reliabilities ranging from .72 to .89 (See Table 32 and 33). The measurement

model demonstrated good factor loadings ranging from .54 to .98 and model fit with the data (See Table 28). In addition, most of the squared multiple correlations were in an acceptable range of greater than .5. The item "I use my calendar to schedule my exercise time" had the lowest SMC. 29% of the variance in this item and could be explained by the Dramatic Relief factor. The poor fit indices may reflect a lack of relationship among the factors. The correlations among 10 factors ranged from .23 to .86.

Effect size.

Based on the Transtheoretical Model of Change, the PCE measure has been applied in exercise research as ten individual scales across five and three stages. A series of ANOVA tests was used to demonstrate the differences in ten processes across the Exercise Stages of Change. The hypothesis of the ANOVA test was that the mean score of at least one stage of change would be different from others. Table 34 presents the mean, standard deviation, and number of subjects in each group. The ANOVA test results demonstrated that the means of the ten scales were significantly different across the five and three stages (See Table 35 for five experiential processes and Table 36 for behavioral processes). Results from series of Post-hoc tests were presented in the following section.

Overall of ten processes, the Precontemplation were significantly different from all Contemplation, Preparation, Action and Maintenance stages on eight processes except Dramatic Relief and Helping Relationship at $p < .05$. Participants in the Precontemplation used the eight processes significantly less often than those in other stages. For using the Dramatic Relief and Helping Relationships processes, participants in Precontemplation stage were significantly different from those in all Preparation, Action, and Maintenance

Table 34: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Processes of Changes for Exercise*

Subscale/	Higher Stage of Change group			Lower Stage of Change group			SDEF	*CI* for Effect Size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
1. Behavioral									
Self- liberation									
Con & Pre	61	2.26	1.13	43	1.05	1.02	1.11	0.68	1.52
Prep & Con	81	2.86	0.74	61	2.26	1.13	0.64	0.29	0.98
Act & Prep	88	3.27	0.70	81	2.86	0.74	0.57	0.26	0.87
Main & Act	138	3.38	0.70	88	3.27	0.70	0.16	-0.11	0.43
Main & Pre	138	3.38	0.70	43	1.05	1.02	2.95	2.48	3.39
Soint & Noint	142	2.60	0.97	43	1.05	1.02	1.57	1.19	1.94
Ex & Soint	226	3.33	0.70	142	2.60	0.97	0.90	0.68	1.12
Ex & Noint	226	3.33	0.70	43	1.05	1.02	3.00	2.58	3.40
Reinforcement Management									
Con & Pre	61	2.86	0.97	37	2.35	1.12	0.50	0.08	0.91
Prep & Con	81	3.18	0.72	61	2.86	0.97	0.37	0.04	0.71
Act & Prep	88	3.52	0.59	81	3.18	0.72	0.53	0.22	0.83
Main & Act	138	3.58	0.61	88	3.52	0.59	0.09	-0.17	0.36
Main & Pre	138	3.58	0.61	37	2.35	1.12	1.65	1.24	2.04
Soint & Noint	142	3.04	0.85	37	2.35	1.12	0.76	0.38	1.13
Ex & Soint	226	3.56	0.60	142	3.04	0.85	0.73	0.51	0.94
Ex & Noint	226	3.56	0.60	37	2.35	1.12	1.73	1.35	2.10
Stimulus Control									
Con & Pre	61	1.21	1.19	43	0.27	0.63	0.94	0.52	1.34
Prep & Con	81	1.59	1.20	61	1.21	1.19	0.32	-0.02	0.65
Act & Prep	88	2.34	1.06	81	1.59	1.20	0.67	0.35	0.98
Main & Act	137	2.33	1.23	88	2.34	1.06	-0.01	-0.28	0.26
Main & Pre	137	2.33	1.23	43	0.27	0.63	1.84	1.44	2.23
Soint & Noint	142	1.42	1.21	43	0.27	0.63	1.05	0.68	1.40
Ex & Soint	225	2.34	1.17	142	1.42	1.21	0.77	0.55	0.99
Ex & Noint	225	2.34	1.17	43	0.27	0.63	1.88	1.51	2.24

Table 34 (continued). *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Processes of Changes for Exercise*

Subscale/	Higher Stage of Change group			Lower Stage of Change group			SDEF	*CI* for Effect Size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Helping relationships									
Con & Pre	61	1.68	0.94	43	1.19	1.09	0.48	0.08	0.87
Prep & Con	79	2.24	1.04	61	1.68	0.94	0.57	0.23	0.91
Act & Prep	88	2.52	1.03	79	2.24	1.04	0.27	-0.04	0.57
Main & Act	138	2.19	1.13	88	2.52	1.03	-0.31	-0.57	-0.04
Main & Pre	138	2.19	1.13	43	1.19	1.09	0.89	0.53	1.24
Soint & Noint	140	2.00	1.03	43	1.19	1.09	0.77	0.41	1.12
Ex & Soint	226	2.32	1.10	140	2.00	1.03	0.30	0.09	0.51
Ex & Noint	226	2.32	1.10	43	1.19	1.09	1.02	0.68	1.36
Counterconditioning									
Con & Pre	61	1.37	0.97	43	0.81	0.91	0.58	0.18	0.98
Prep & Con	81	1.93	0.97	61	1.37	0.97	0.58	0.24	0.92
Act & Prep	88	2.38	0.85	81	1.93	0.97	0.48	0.18	0.79
Main & Act	136	2.35	1.02	88	2.38	0.85	-0.03	-0.29	0.24
Main & Pre	136	2.35	1.02	43	0.81	0.91	1.55	1.16	1.92
Soint & Noint	142	1.69	1.01	43	0.81	0.91	0.89	0.53	1.24
Ex & Soint	224	2.36	0.95	142	1.69	1.01	0.69	0.47	0.90
Ex & Noint	224	2.36	0.95	43	0.81	0.91	1.64	1.28	1.99

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise;
SDEF = Standardized Effect Size; CI = 95% Confidence Interval

Table 34 (continued). *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Processes of Changes for Exercise*

Subscale/	Higher Stage of Change group			Lower Stage of Change group			SDEF	*CI* for Effect Size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
2. Experiential									
Social liberation									
Con & Pre	61	2.62	0.99	41	1.78	1.37	0.73	0.31	1.13
Prep & Con	81	3.09	0.77	61	2.62	0.99	0.54	0.20	0.88
Act & Prep	83	3.14	0.76	81	3.09	0.77	0.07	-0.24	0.38
Main & Act	138	3.13	0.77	83	3.14	0.76	-0.02	-0.29	0.26
Main & Pre	138	3.13	0.77	41	1.78	1.37	1.44	1.06	1.82
Soint & Noint	142	2.89	0.90	41	1.78	1.37	1.08	0.71	1.44
Ex & Soint	221	3.14	0.76	142	2.89	0.90	0.31	0.09	0.52
Ex & Noint	221	3.14	0.76	41	1.78	1.37	1.54	1.17	1.89
Self reevaluation									
Con & Pre	58	2.77	1.02	43	1.96	1.33	0.70	0.28	1.10
Prep & Con	81	3.00	1.02	58	2.77	1.02	0.22	-0.12	0.56
Act & Prep	88	3.54	0.63	81	3.00	1.02	0.65	0.34	0.96
Main & Act	138	3.57	0.54	88	3.54	0.63	0.06	-0.21	0.32
Main & Pre	138	3.57	0.54	43	1.96	1.33	2.02	1.61	2.41
Soint & Noint	139	2.90	1.02	43	1.96	1.33	0.85	0.50	1.20
Ex & Soint	226	3.56	0.57	139	2.90	1.02	0.85	0.63	1.07
Ex & Noint	226	3.56	0.57	43	1.96	1.33	2.14	1.77	2.51
Environmental reevaluation									
Con & Pre	61	2.10	1.10	43	1.65	1.22	0.39	-0.01	0.78
Prep & Con	80	2.70	0.88	61	2.10	1.10	0.61	0.26	0.94
Act & Prep	88	2.98	0.93	80	2.70	0.88	0.32	0.01	0.62
Main & Act	138	3.11	0.94	88	2.98	0.93	0.14	-0.13	0.40
Main & Pre	138	3.11	0.94	43	1.65	1.22	1.45	1.07	1.82
Soint & Noint	141	2.44	1.03	43	1.65	1.22	0.73	0.38	1.08
Ex & Soint	226	3.06	0.94	141	2.44	1.03	0.64	0.43	0.86
Ex & Noint	226	3.06	0.94	43	1.65	1.22	1.43	1.08	1.78

Table 34 (continued). *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Processes of Changes for Exercise*

Subscale/	Higher Stage of Change group			Lower Stage of Change group			SDEF	*CI* for Effect Size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Consciousness- raising									
Con & Pre	61	1.06	0.83	43	0.45	0.70	0.78	0.37	1.18
Prep & Con	81	1.49	1.14	61	1.06	0.83	0.42	0.08	0.75
Act & Prep	88	1.65	1.04	81	1.49	1.14	0.15	-0.15	0.45
Main & Act	138	1.68	1.11	88	1.65	1.04	0.03	-0.24	0.29
Main & Pre	138	1.68	1.11	43	0.45	0.70	1.20	0.83	1.56
Soint & Noint	142	1.30	1.04	43	0.45	0.70	0.88	0.52	1.23
Ex & Soint	226	1.67	1.08	142	1.30	1.04	0.34	0.13	0.55
Ex & Noint	226	1.67	1.08	43	0.45	0.70	1.18	0.84	1.52
Dramatic relief									
Con & Pre	59	1.21	1.22	43	0.65	0.78	0.53	0.12	0.92
Prep & Con	81	1.41	0.97	59	1.21	1.22	0.18	-0.15	0.52
Act & Prep	87	1.66	0.97	81	1.41	0.97	0.26	-0.05	0.56
Main & Act	138	1.33	1.12	87	1.66	0.97	-0.31	-0.57	-0.04
Main & Pre	138	1.33	1.12	43	0.65	0.78	0.65	0.30	1.00
Soint & Noint	140	1.32	1.08	43	0.65	0.78	0.66	0.31	1.00
Ex & Soint	225	1.46	1.07	140	1.32	1.08	0.13	-0.09	0.34
Ex & Noint	225	1.46	1.07	43	0.65	0.78	0.78	0.45	1.11

Note. Pre = Precontemplation; Con = Contemplation; Prep = Preparation; Act = Action; Main = Maintenance; Noint = No intention; Soint = Have some intention; Ex = Regular exercise;
SDEF = Standardized Effect Size; CI = 95% Confidence Interval.

Table 35: *Analysis of Variance for Five Experiential Processes of Change for Exercise*

Scale		*SS*	*df*	*MS*	*F*	p
Consciousness- raising						
Three Stages	Between	56.34	2	28.17	26.40	.000
	Within	435.40	408	1.07		
Five Stages	Between	62.68	4	15.67	14.83	.000
	Within	429.06	406	1.06		
Dramatic Relief						
Three Stages	Between	34.42	2	17.21	18.34	.000
	Within	380.17	405	0.94		
Five Stages	Between	36.93	4	9.23	9.85	.000
	Within	377.66	403	0.94		
Environmental Reevaluation						
Three Stages	Between	86.88	2	43.44	43.51	.000
	Within	406.33	407	1.00		
Five Stages	Between	100.12	4	25.03	25.79	.000
	Within	393.09	405	0.97		
Self reevaluation						
Three Stages	Between	107.55	2	53.78	74.36	.000
	Within	292.89	405	0.72		
Five Stages	Between	109.33	4	27.33	37.84	.000
	Within	291.11	403	0.72		
Social Liberation						
Three Stages	Between	63.79	2	31.90	40.38	.000
	Within	316.73	401	0.79		
Five Stages	Between	71.59	4	17.90	23.11	.000
	Within	308.93	399	0.77		

Table 36: *Analysis of Variance for Five Behavioral Processes of Change for Exercise*

Scale		*SS*	*df*	*MS*	*F*	p
Counterconditioning						
Three Stages	Between	102.67	2	51.34	54.84	.000
	Within	380.05	406	0.94		
Five Stages	Between	113.93	4	28.48	31.20	.000
	Within	368.79	404	0.91		
Helping Relationships						
Three Stages	Between	47.54	2	23.77	20.50	.000
	Within	470.78	406	1.16		
Five Stages	Between	64.62	4	16.15	14.39	.000
	Within	453.70	404	1.12		
Reinforcement Management						
Three Stages	Between	57.27	2	28.63	50.45	.000
	Within	228.15	402	0.57		
Five Stages	Between	60.87	4	15.22	27.10	.000
	Within	224.56	400	0.56		
Self- liberation						
Three Stages	Between	200.57	2	100.28	142.21	.000
	Within	287.70	408	0.71		
Five Stages	Between	213.53	4	53.38	78.89	.000
	Within	274.74	406	0.68		
Stimulus Control						
Three Stages	Between	185.53	2	92.76	71.63	.000
	Within	527.08	407	1.30		
Five Stages	Between	190.58	4	47.65	36.96	.000
	Within	522.03	405	1.29		

stages at $p < .05$. In comparing Precontemplation and Maintenance stages, the differences were significant on ten processes at $p < .05$. In addition, participants in Action and Maintenance stages had consistently no significant difference of the use on all ten processes.

For the experiential processes, the differences between exercise groups (Action and Maintenance groups) and Precontemplation and Contemplation were significant on four experiential processes at $p < .05$ except Dramatic Relief. Dramatic Relief had significant differences only between Precontemplation and the other four stages; no significant differences of using Dramatic Relief among participants in Contemplation, Preparation, Action, and Maintenance stages was found. Participants in Preparation, Action, and Maintenance stages were not significant different in using Consciousness-raising, Dramatic Relief, and Social liberation strategies. Differences in comparing between Contemplation and Preparation stages were not significant for the three experiential processes except Environment Reevaluation and Social Liberation.

For Environmental Reevaluation (ER), Maintenance was significantly different from Precontemplation, Contemplation, and Preparation at $p < .05$. No significant differences in comparing between Precontemplation and Contemplation, between Preparation and Action, and between Maintenance and Action were found. For Self-reevaluation, all comparisons across the five stages were significant at $p< .05$, except in comparing between Contemplation and Preparation and between Action and Maintenance stages.

For the five behavioral processes, most processes demonstrated significant mean differences across the five stages at $p < .05$. The differences between the Contemplation and Preparation stages were significant for four processes including Self- liberation, Helping Relationships, and Counterconditioning at $p < .05$. Comparing differences between Preparation and Action stages were significant for the four behavioral processes at $p < .05$ except Helping Relationships.

The comparisons among the three stages were significant on all ten processes of change except in comparing Dramatic Relief between having intention and regular exercise groups. Using ten processes significantly increased from no intention to regular exercise groups. The Figures 6-7 visualize the patterns of t-scores of the 10 processes across 5 and 3 Exercise Stages of Change.

Based on the Transtheoretical Model of Change, the ten stages are categorized into two higher-order factors: Experiential processes of change (EPC) and Behavioral processes of change (BPC). The processes have been applied to the second-order factors differently. To demonstrate meaningful of mean difference across five and three stages, the effect sizes were calculated. Table 34 presents the effect sizes of the mean differences across five and three ESC. Both Experiential and Behavioral processes demonstrated similar results as the following:

1) The effect sizes of mean differences between Action and Maintenance ESC were small with 95% confidence interval contained zero for all processes except the Dramatic Relief and Helping relationship scale (See

Figure 6. Linear Plot of the T-score of Experiential Processes Across Five Exercise Stages of Change

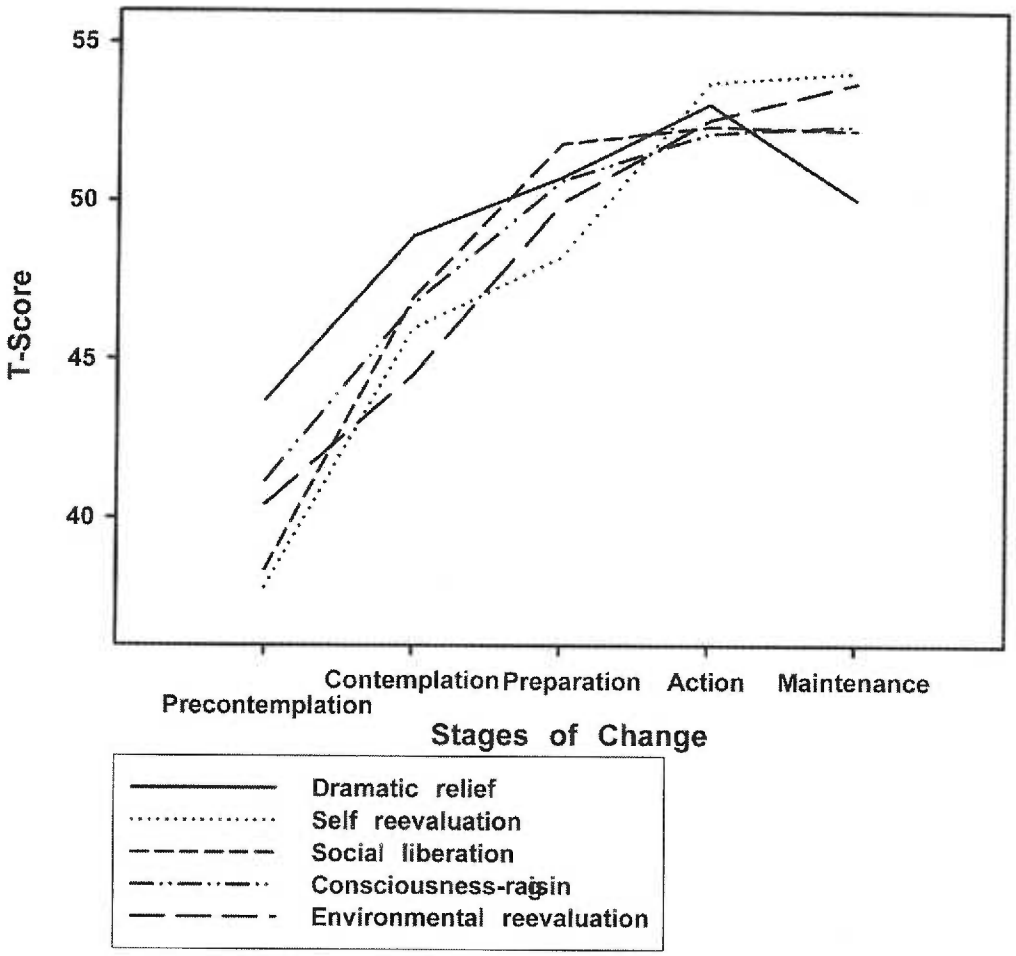


Figure 7. Linear Plot of the T-score of Behavioral Processes Across Five Exercise Stages of Change

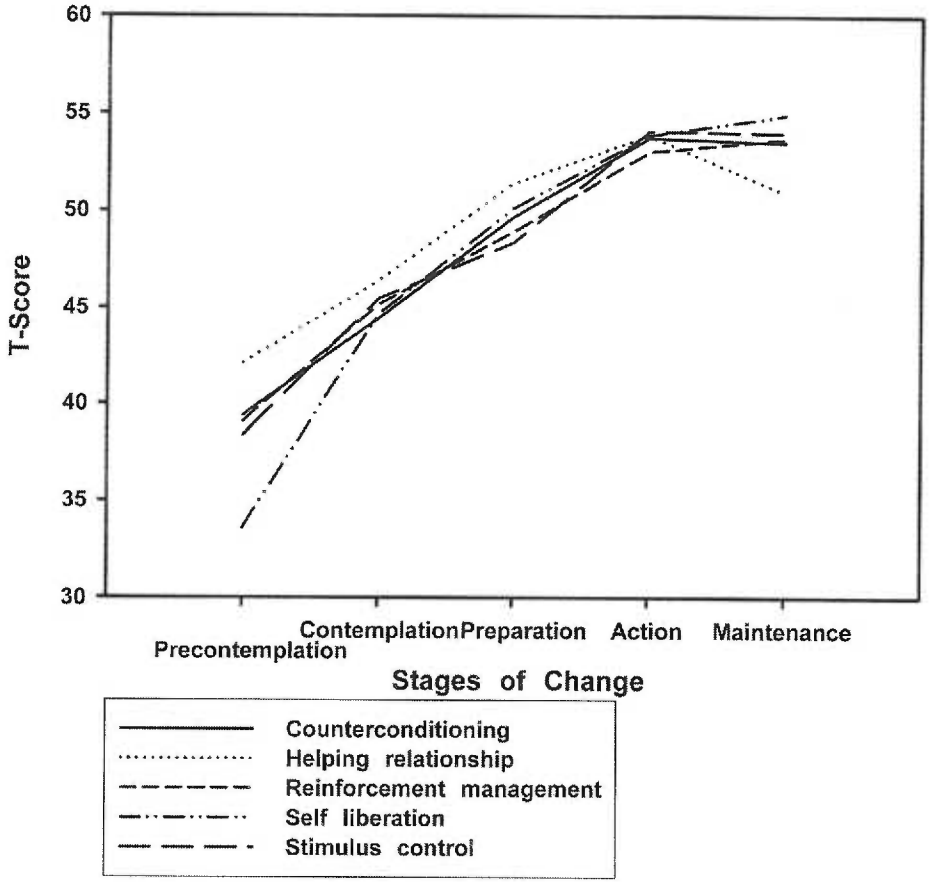


Table 34). Small negative effect sizes were found. The participants in the Maintenance

2) ESC had others helping them to regularly exercise less than those in the Action ESC did. In other words, persons whose behaviors become habits, will perform them regardless of others' influence. The result is consistent with the previous studies and the findings of Social Influence of this study. For Dramatic Relief, participants in the Maintenance ESC used their intense emotional experience related to exercise less than those in the Action ESC.

3) For all processes, large effect sizes of mean difference were consistently found between Precontemplation and Maintenance ESC and between the no intention and exercise groups ($d > .79$).

4) All pair comparisons across 3 stages demonstrated significant mean differences with effect sizes ranging from small to large except Dramatic relief process (See Table 34). There were small effect sizes only from four comparisons between having intention and exercise regularly groups for three experiential processes (Social Liberation and Consciousness-raising) and one behavioral process (Helping Relationship). For Dramatic relief, these stages had effect size less than .2 with the 95% confidence interval containing zero.

Comparing participants in the Precontemplation and Contemplation Stages, nine of ten scales demonstrated effect sizes ranging from small to large (See Table 34). Only the Environmental reevaluation scale had a small effect size with zero contained in the 95% confidence interval. Comparing participants in the Action and Preparation stages, only the Self-reevaluation scale demonstrated a medium effect size. In contrast, all of the Behavioral processes except Helping Relationship had effect sizes ranging from small to medium (See Table 34). The results suggested that the participants applied the processes differently across stages.

In conclusion, the 30-item Processes of Change for Exercise measure was confirmed as having ten factors. The 10 scales demonstrated good internal-consistency reliabilities and construct validity both from factor analysis and differences in Exercise Stages of Change groups. It is important to note that the sample size was small based on the ratio of the participants and estimated parameters. The chi-square test should be interpreted with caution.

Social Influences for Exercise (SIE)

The original SIE measure has two higher-order factors, each having three scales: Positive Social Influence (Companionship Support (CS), Informational Support (IS), and Esteem Support (ES)) and Negative Social Influence (Inhibitive Behavior (IB), Justifying Behavior (JB), and Criticizing Behavior (CB) The SIE measure consists of 27 items, including five items for each Positive Social Influence scale and four items for each Negative Social Influence scale. Four hundred and one participants completed the responses on this measure. Seventeen items had no missing data while ten items had less

than 1% missing data. Each participant responded more than 90% on the whole measure and completed at least 75% of the items on each scale. Therefore, the available scores were justified for calculation for the mean of each scale.

Hypothesized Model Analysis

Item analysis.

Table 37 presents internal-consistency reliability coefficient, item-remainder coefficient, item discrimination, item difficulty, factor loading, and the highest modification indices for the 27-item SIE measure. Internal-consistency reliability estimates were calculated separately for six scales. The coefficient alpha of the four Criticizing Behavior (CB) items was .62 lower than acceptable value of .7. Item-intercorrelation values were low, ranging from .13 to .41. Item-remainder coefficients were within acceptable ranges (.35-.46). Item difficulty values of the four CB items were lower than .1 (See Table 37). Based on the criterion as stated in the Method Chapter, these items should be eliminated. The CB items also demonstrated poor discrimination. The item analysis' findings had similar results to the Cons scale of Decisional Balance for Exercise in terms of expressing negative feeling about others. The item analysis supports the notion that the CB scale is not applicable for Thai people.

Similar to the CB scale findings, Inhibitive Behavior (IB) scale had a low internal-consistency reliability coefficient of .58. Deletion of an item, "Warned you that starting an exercise would worsen your health", increased the coefficient alpha of the Inhibitive Behavior scale to .73. Item-intercorrelation values also demonstrated that the

Table 37: *Item Analysis of Social Influence for Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Negative Influences					
Criticizing behavior (α=.62)					-
6: Excluded you because of your low ability in an exercise?	0.35	0.07	0.02	0.62	6.93
12: Forced you to do an exercise which you disliked?	0.44	0.10	0.03	0.51	4.49
14: Criticized your low skill level in an exercise?	0.46	0.2	0.07	0.57	-
25: Complained that your skill in an exercise is not good enough?	0.35	0.07	0.02	0.39	-
Inhibitive behavior (α=.58)					
2: Warned you that starting an exercise would worsen your health?	0.06	0.15	0.06	0.12	-
8: Told you that you should keep away from an exercise in order not to have falls or accidents?	0.53	0.16	0.06	0.74	-
16: Advised you to avoid an exercise in order to avoid injury or ill health?	0.48	0.12	0.04	0.72	-
18: Forbidden you to engage in an exercise because of the potential health risk?	0.43	0.11	0.04	0.60	-

Note. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 37 (continued). *Item Analysis of Social Influence on Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Justifying behavior (α=.65)					
4: Told you that you do not need to do more exercise because you are healthy enough?	0.52	0.16	0.06	0.60	-
10: Told you that more exercise is not necessary for you because you are very busy in your other daily routines?	0.30	0.15	0.05	0.49	4.01
20: Told you that you do not need to do more exercise because you know how to care for your health?	0.43	0.15	0.05	0.50	7.43
22: Told you that more exercise is not necessary for you because it is not appropriate for your age?	0.48	0.10	0.04	0.60	12.67

Note. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 37 (continued). *Item Analysis of Social Influence on Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Positive Supports					
Informational support (α=.86)					
7: Explained to you why an exercise is important to change your health?	0.60	0.78	0.41	0.63	-
9: Suggested an exercise program or facility, which might assist your health?	0.66	0.68	0.30	0.73	-
17: Clarified for you how you may achieve y our health goals through an exercise?	0.76	0.89	0.40	0.84	-
19: Explained to you about the amount or intensity of an exercise necessary for improving your health?	0.67	0.64	0.26	0.75	-
23: Informed you about the expected positive effect of an exercise on your health?	0.71	0.83	0.42	0.78	8.72
Companionship support (α=.85)					
1: Made plans with you for doing an exercise together?	0.70	0.58	0.22	0.76	-
3: Promised you that they would participate in an exercise with you?	0.73	0.54	0.19	0.81	7
5: Changed their schedules so you can do an exercise together?	0.57	0.28	0.10	0.63	13.94
15: Teamed up with you to engage in an exercise together?	0.73	0.66	0.26	0.80	4.15
21: Given you helpful reminders to do an exercise together with them?	0.61	0.64	0.27	0.70	10.52

Note. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

Table 37 (continued). *Item Analysis of Social Influence on Exercise*

Subscale/items	IRC	ID_{is}	ID_{if}	Factor Loading	Highest MI
Esteem support (α=.91)					
11: Praised you that your exercise level is superior to that of other people at your age?	0.73	0.73	0.31	0.77	7.78
13: Praised you for your versatility in an exercise?	0.66	0.56	0.22	0.71	16.84
24: Affirmed that you have done well in your exercise?	0.81	0.84	0.37	0.87	11
26: Told you that you should be proud of your exercise skills?	0.80	0.82	0.31	0.87	-
27: Complimented you on the mastery of an exercise skill?	0.82	0.81	0.30	0.88	-

Note. IRC = Item-remainder coefficient; ID_{is}= item discrimination; ID_{if}= item difficulty; MI = modification indices.

item had negative correlations with two items of "Forbidden you to engage in an exercise because of the potential health risk" and "Advised you to avoid an exercise in order to avoid injury or ill health" (r = -.009 and .026, respectively) and poor correlation with an item, "Told you that you should keep away from an exercise in order not to have falls or accidents." The other three items were in acceptable range of item-intercorrelation (.39-.51).

Moreover, the item difficulty analysis presented that the four items on the IB scale had six or fewer participants endorsing these items. All items demonstrated poor item-discrimination as well (See Table 37). The last scale of Negative Social Influence was Justifying Behavior (JB). This scale demonstrated similar findings to the two scales of Negative Social Influence. The four items had a low alpha coefficient of .65, six percent or fewer of participants endorsed these items, and there was poor item-discrimination in the range of .10 to .16. Although these items on these scales demonstrated good item-remainder coefficients in the acceptable range of .3-.79, they were meaningless as outcome measures because of restricted range of the responses and poor discrimination.

As stated in the Decisional Balance scale, harmony in Thai culture is maintained by avoiding unnecessary conflict with others. Thai people would have extreme reluctance to impose on anyone or disturb one's personal equilibrium by direct criticism, challenge, or confrontation. More than 85% of participants rated their family or friends as never having done or said the behaviors described in most of the items on the Negative Social Influence Scales. The restricted ranges of scale response reflected the limited difficulty

and discrimination. Therefore, the 12 items of the Negative Social Influence scales were deleted from further analysis.

For the Positive Social Influence scales, the five items on each scale of the Informational Support (IS), Companionship Support (CS), and Esteem Support (ES) had internal-consistency reliability coefficients of .86, .85, and .91, respectively. Item-intercorrelation values of each scale were in the acceptable range of .45 to .8. Item-remainder coefficients of 15 items of the three scales ranged from .57-.82. The 5 items on each scale of IS, CS, and ES scales demonstrated good internal-consistency reliability.

Most items on the Informational and Esteem Support scales were in the acceptable difficulties range of .3 - .42 (See Table 37). Only two items, "Explained to you about the amount or intensity of an exercise necessary for improving your health" and "Praised you for your versatility in an exercise" had quite low item difficulties of .26 and .2. However, all items on these scales demonstrated good discrimination between participants with high scores on the related scales and those with low scores. Therefore, all items on the Informational and Esteem Support scales were retained for further analysis.

All items of the Companionship Support scale had item difficulty values in the range of .1 to .27, which were lower than the acceptable value of .3. Approximately 10 to 27 percent of the participants received these supports from their family or friends often or very often. In spite of low item difficulties, these items demonstrated significant difference between high-scoring and low scoring participants on the CS. Overall, this

scale demonstrated good internal-consistency reliability and the five items demonstrated acceptable discrimination.

In summary, all items on the Negative Social Influence scales were deleted, based on the item analysis and cultural issue as mentioned. The three Positive Social Influence scales, consisting of five items on each scale, were retained.

Construct validity.

The sample size for the confirmatory factor analysis for the SIE was 309. The ratio of cases to estimated parameters of the SIE measure was adequate at approximately 6:1. A hypothesized measurement model was tested to determine whether the 27 items adequately represented for the six scales. The factor loadings and the highest modification indices are presented in Table 37. For the three scales of Positive Social Influence, the 15 factor loadings were significant on the three hypothesized factors based on critical rati os greater than 2. All loadings of the 15 items on their respective scales were greater than .6. Overall, 15 items loaded well on their three respective scales.

Squared Multiple Correlations (SMC) of the 15 items illustrated that the variance explained in the items by the factors ranged from .39 - .77. An SMC as the estimate of reliability should be at least .50. Only the two items including "Explained to you why an exercise is important to change your health" and "Changed their schedules so you can do an exercise together" had marginal acceptable SMC of .4 and .39, respectively. However, these items had good factor loadings to their respective factors of .63. The highest modification indexes for the three PSI scales were less than 20 which were small in

comparison to the model chi-square. In summary, the hypothesized paths between each item and related factors were strongly confirmed for the three PSI scales.

All 12 items factor loadings of the three Negative Social Influence scales were significant on the hypothesized factor based on critical ratios greater than 2. The 10 items loaded well on their respective factors with the loading values of greater than .49. Only two items had poor factor loadings of .12 and .39. The two items "Warned me that starting an exercise would worsen your health" and "Complained that your skill in an exercise is not good enough". The squared multiple correlation coefficients of ten items illustrated that the variance explained in the items by the factors were low in the range of .15 to .39. Only two items on these scales had SMC greater than .5. They were "Told you that you should keep away from an exercise in order not to have falls or accidents" and "Advised you to avoid an exercise in order to avoid injury or ill health." The highest Modification Indices of the SIE were 12 or less which were small in comparison to the model chi-square (See Table 37) and the paths they suggested were not theoretically justified.

The six scales of SIE were significantly correlated to one another. The correlations among the five NSI scales (.7 - .9) and among the five PSI scales (.69 - .7) were higher than the correlations of the NSI and PSI scales to one another (.2 - .5). In summary, the hypothesized paths between each item and related factors were more strongly confirmed for the PSI scales than the NSI scales.

Model evaluation.

The hypothesized factor model chi-square was significant ($\chi^2 309 = 1031.56$, $p < .001$); however, this test is sensitive to sample size. The ratio of chi-square and degree of freedom was 3.3:1, which is greater than the recommended ratio of 3:1. This implied that adjusted degree of freedom; the model did not fit with the data. The GFI was .83, AGFI dropped to .79, and CFI was .86. All these indexes were lower than the suggested value of .9 indicating a good fitting model. The RMSEA of .08 was higher than acceptable values of .07. As mentioned earlier, the construct validity of the three Positive Social Influence scales were confirmed in all significant paths with good factor loadings, and variance explained on each item from the related factors. In contrast, items on the three Negative Social Influence confirmed with all significant paths but poor variance explained in the related items.

In summary, the 15-items of Positive Social Influence on Exercise demonstrated significant factor loading paths with the values greater than .4. The three scales of PSI also demonstrated very good internal-consistency reliabilities. All items on the Informational Support and Esteem Support scales demonstrated good difficulties and discriminations. All items on the Companionship Support scale demonstrated acceptable item discrimination even though some items had low difficulties. All 15 items of PSI were maintained in the final scale. The three scales of the Negative Social Influence demonstrated poor internal-consistency reliability with coefficient alpha values less than .7. In addition, all items had poor difficulties and discriminations. As previously mentioned with the concern of Thai culture, no NSI scales were applicable as outcome

measures for this population. The three scales of NSI were eliminated from the final measure of Social Influence for Exercise. The final scale containing 15-item positive social influence is named as the Positive Social Influence for Exercise.

Final Model Confirmatory Factor Analysis

The final 15-item Positive Social Influence for Exercise measure consists of three scales with five items each. Because no items of PSI were deleted, the internal-consistency reliabilities of the three final scales remained the same with the hypothesized measure (See Table 37). Confirmatory factor analysis was reanalyzed for a model of three factors to demonstrate the construct of Positive Social Influence for Exercise. In addition, construct validity was evaluated across the five and three Exercise Stages of Change. A series of ANOVAs and effect size calculations was performed.

Model evaluation.

The 15 items of the Positive Social Influence for Exercise measure were reanalyzed for a confirmatory factor analysis on three factors. The ratio of cases and an estimated parameter was good at 12:1. The chi-square was significant ($\chi^2_{87} = 278.28$, $p < .001$) with the model's chi-square per degree of freedom ratio of 3.2. The goodness-of-fit index was greater than the suggested value .85 but AGFI was less than .9 accepted value. The CFI was greater than .9 and RMSEA was in the acceptable level of .07. These numbers indicated a marginal fit of the model with the data. Three factors were significantly correlated to each other with t-value greater than 2 (r = .69 -.74)

All factor-loading paths were significant with critical ratios greater than 2. The 15 items loaded well on their respective factors ranging from .63 to .88. The squared

multiple correlations illustrated that the variance explained in the items by the factors in the range of .4 to .8. Only two items had marginally acceptable SMC values of .4. There were "Explained to you why an exercise is important to change your health" and "Changed their schedules so you can do an exercise together." The highest modification indexes for the three scales were less than 10, which were small in comparing to the model chi-square. The factor loadings of 15 items loaded well. This confirmed that the constructs of this measure were consistent with the three scales of the original measure and the measurement model fit the data.

Effect size.

To test the hypothesis that mean scores of the Companionship, Informational, and Esteem supports were significantly different across the five and three Exercise Stages of Change, A series of ANOVA tests were applied. Table 38 presents the mean, standard deviation, and number of participants with CAD in each group. The ANOVA results demonstrated that the mean scores of IS, CS, and ES were significantly different across the five and three stages (IS: $F_{4, 406} = 7.74$, $p < .001$, $F_{2, 408} = 11.28$, $p < .001$; CS: $F_{4, 406} = 20.46$, $p < .001$, $F_{2, 408} = 39.1$, $p < .001$; and ES: $F_{4, 406} = 39.13$, $p < .001$, $F_{2, 408} = 72.98$, $p < .001$, respectively). The post-hoc tests using Bonferroni corrections with the significance level set at .05 were applied for comparisons across five and three stages. For Informational Supports, there were significant mean differences in comparing between Precontemplation and Preparation, Action and Maintenance stages and between Contemplation and Action stages at $p < .05$. Participants in Precontemplation had significantly lower informational supports from their family members and friends than

Table 38: *Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Social Influence for Exercise*

Subscale/	Higher stage of change group			Lower stage of change group			SDEF	CI for effect size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Informational supports									
Con & Pre	61	1.66	1.00	43	1.20	1.00	0.45	0.06	0.85
Prep & Con	81	1.91	1.07	61	1.66	1.00	0.24	-0.09	0.57
Act & Prep	88	2.22	0.95	81	1.91	1.07	0.31	0.00	0.61
Main & Act	138	1.88	1.07	88	2.22	0.95	-0.33	-0.60	-0.06
Main & Pre	138	1.88	1.07	43	1.20	1.00	0.64	0.29	0.99
Soint & Noint	142	1.80	1.05	43	1.20	1.00	0.58	0.23	0.92
Ex & Soint	226	2.01	1.04	142	1.80	1.05	0.20	-0.01	0.41
Ex & Noint	226	2.01	1.04	43	1.20	1.00	0.78	0.45	1.11
Companionship supports									
Con & Pre	61	0.98	0.85	43	0.27	0.56	0.97	0.55	1.37
Prep & Con	81	1.20	0.89	61	0.98	0.85	0.25	-0.09	0.58
Act & Prep	88	1.71	1.04	81	1.20	0.89	0.53	0.22	0.83
Main & Act	138	1.54	1.09	88	1.71	1.04	-0.16	-0.42	0.11
Main & Pre	138	1.54	1.09	43	0.27	0.56	1.29	0.91	1.65
Soint & Noint	142	1.11	0.88	43	0.27	0.56	1.03	0.67	1.39
Ex & Soint	226	1.61	1.07	142	1.11	0.88	0.50	0.29	0.71
Ex & Noint	226	1.61	1.07	43	0.27	0.56	1.33	0.98	1.67

Note. Pre = precontemplation; Con = contemplation; Prep = preparation; Act = action; Main = maintenance; Noint = no intention; Soint = having somewhat intention; Ex = exercise; SDEF = standardized effect size; SEEEF = standard error estimate of effect size.

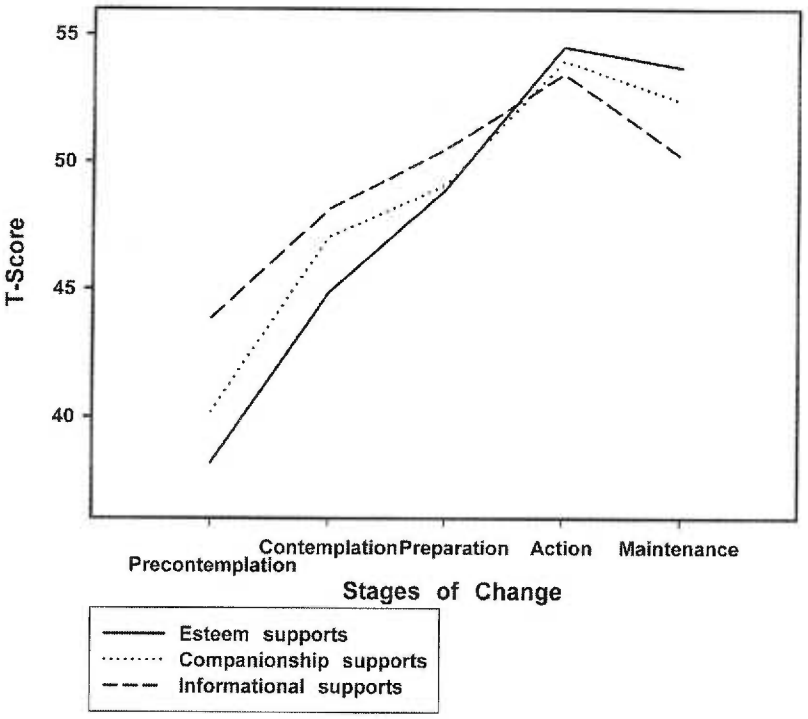
Table 38. (continued)

Effect Size of Mean Differences Between Higher and Lower Exercise Stages of Change of Social Influence for Exercise

Subscale/	Higher stage of change group			Lower stage of change group			SDEF	CI for effect size	
Stages of Change	*n*	*M*	*SD*	*n*	*M*	*SD*		Lower	Upper
Esteem supports									
Con & Pre	61	1.02	0.93	43	0.24	0.40	1.02	0.60	1.43
Prep & Con	81	1.49	0.96	61	1.02	0.93	0.50	0.16	0.83
Act & Prep	88	2.14	1.03	81	1.49	0.96	0.66	0.34	0.96
Main & Act	138	2.05	1.14	88	2.14	1.03	-0.09	-0.35	0.18
Main & Pre	138	2.05	1.14	43	0.24	0.40	1.78	1.39	2.16
Soint & Noint	142	1.29	0.97	43	0.24	0.40	1.20	0.83	1.55
Ex & Soint	226	2.09	1.10	142	1.29	0.97	0.76	0.54	0.98
Ex & Noint	226	2.09	1.10	43	0.24	0.40	1.81	1.45	2.17

Note. Pre = precontemplation; Con = contemplation; Prep = preparation; Act = action; Main = maintenance; Noint = no intention; Soint = having somewhat intention; Ex = exercise; SDEF = standardized effect size; SEEEF = standard error estimate of effect size.

Figure 8. Linear Plot of the T-score of Positive Social Influences Across Five Exercise Stages of Change



those in Preparation, Action and Maintenance. Participants in Contemplation stage had significantly lower IS than those in Action. The IS, CS, and ES demonstrated a similar pattern that participants in Maintenance stage had trendily lower positive supports than those in Action stage. IF, CS and ES had significant mean differences across three stages at $p < .05$ except comparing IF mean difference between Having Intention and Regular Exercise groups. Figure 8 visualizes the patterns of t-scores for the three scales across five and three stages.

To examine the meaningfulness of the existed significant mean differences, the effect sizes of the mean differences from the three Positive Social Influence scales across the Exercise Stages of Change were calculated. Table 38 presents the effect sizes for the three Positive Social Influence scales across the stages. The Esteem Support's mean difference of Esteem Support across five stages and three had medium (.5-.76) to large (1.02-1.81) effect sizes, except when comparing between Action and Maintenance stages. The effect sizes of mean differences in Companionship Supports across five and three stages were in the range medium (.50-.53) to large (.97-1.33) except comparing between Precontemplation and Contemplation and between Action and Maintenance stages. The mean difference of Informational Support scale across five and three stages had effect size ranging from small (.33 -.45) to medium (.58 - .78).

It is important to note that participants in three stages were significantly different in the means of the Companionship and Esteem Support scales. There were medium effect sizes when comparing between Having intention and Exercise groups, and large effect sizes when comparing between No Intention and Having Intention groups and

between No Intention and Exercise groups. The results demonstrated that the three Exercise Stages of Change identified more meaningful mean differences for these three scales better than the five stages.

In conclusion, the Positive Social Influence for Exercise measure of three factors with five items in each factor demonstrated good internal-consistency reliability, item variability, and construct validity from factor construct and differences in Exercise Stages of Change.

CHAPTER 5: DISCUSSION

This chapter begins with a discussion of the meaning of the results relating to each measure. Following this is a discussion of the limitations of the study in terms of methodology, and the implications for theory, research and practice. The final section addresses the researcher's recommendations for future study.

Meaning of the Results

It appears that the modified Thai versions of the PROS for Exercise (PROS), Self-efficacy for Overcoming Barriers to Exercise (SEOBE), Processes of Change for Exercise (PCE), and Positive Social Influence for Exercise (PSIE), and modified Community Healthy Activities Model Program for Seniors Physical Activities Questionnaire for Older Adults (CHAMPS) questionnaires were indeed successful in terms of having good reliability and validity. The Cons of the Decisional Balance for Exercise and Negative Social Influence were deleted to be congruent with Thai culture. The modified questionnaires were renamed to PROS of Exercise (PROS) and Positive Social Influence for Exercise (PSIE) and also demonstrated good reliability and validity. The meaning of the findings is addressed in the following sections.

Modified Community Healthy Activities Model Program for Seniors Physical Activities Questionnaire (CHAMPS)

No previous study has identified types and amount of activities done by the Thai population with coronary artery disease. In this study, all thirty-seven activities included in the modified CHAMPS physical activity measure were identified as having been done by at least five percent of participants in this study; therefore, the activity list is

appropriate for Thai people with a diagnosis of CAD. For physical activities of at least moderate intensity level, approximately 57% of participants of this study had been exercising by walking fast or briskly for exercise walking. And also for the physical activities lower than moderate intensity level, 68% of participants walked leisurely for exercise or pleasure and 77% of those walked to do errands. The findings were consistent with a previous study: 79% of Thai older adults with coronary artery disease did exercise by walking (Saiseesub, 2000). Charoenkitkarn (2000) also demonstrated that before having diagnosis of hypertension, 56.6% of Thai older adults aged older than 60 years old in a senior community center reported walking for exercise. A possible rationale may be that walking for exercise does not need either special skills or equipments. People can do it anywhere in their yard, along walking paths, or in a park.

In contrast, other forms of exercises such as swimming, aerobics, or sports, were reported by less than 10% of participants. These types of exercise require resources, formal training, and co-participants that may not accommodated into this sample's daily life. A study demonstrated that Thai older adults perceived that exercise was not socially appropriate for their generation (Pothiban, 1993). It is possible that older adults may be concerned about harm to their health because of incorrect exercising or being unable to participate in available exercise training programs (Conn, 1996).

Some participants in this study had exercised only every day for more than 6 months; however, they did not do any other activities. These people were categorized in the maintenance stage using Exercise Stages of Change questionnaire. In contrast, another group of participants did not do exercise, but were active in life-style activities by

taking care of housework. The findings thus demonstrated two ways of exercise: being active in lifestyle activities and being active by structured exercise. The modified CHAMPS questionnaire can assess both types of activities. In summary, physical activities in the daily life of Thai people with CAD, which included exercise activities and life-style activities, were covered adequately by the modified CHAMPS questionnaire.

The modified CHAMPS questionnaire demonstrated marginal acceptable concurrent validity with the five scales of SF-36 (General Health, Physical Functioning, Mental Health, and Bodily Pain). Concurrent validity as a type of criterion-related validity is required for scale development to demonstrate empirical association between a developing measure and some standard measure obtained at the same time (DeVellis, 2003). The correlations of this study were small in magnitude (r=.13-.23). Higher correlations indicate high validity of the measure. Relationships between two types of physical activities: all physical activities and at least moderate levels of physical activities, and the SF-36 were consistent with previous studies (Harada, Chiu, King, & Stewart, 2001; Stewart et al., 2001). However, those previous studies demonstrated correlations that were small to moderate in magnitude among older adults in community (r = .05 - .42) (Harada et al., 2001; Stewart et al., 2001). These low to moderate correlations are not unexpected, because the SF-36, which measures health-related quality of life, is a measure of participants' perception about their health related to quality of life, while the modified CHAMPS questionnaire is an objective measure related to actual activities done.

It is important to note that in this study, the Physical Functioning (r = .2 and .22) had higher correlations with all physical activity levels than with the Mental Health (r = .13), and Bodily Pain scales (.03 and .04). These findings were consistent with previous studies of CHAMPS questionnaire. Stewart, et al. (2000) demonstrated the correlations between Physical Functioning scale and all physical activities and at least moderate intensity level of physical activity of .27 and .33, respectively, while those correlations with Bodily Pain and Mental Health were in the range of .05-.11. Harada, et al. (2001) reported correlation with Physical Functioning in the range of .39 - .41 and with Bodily Pain and Mental Health in the range of .26-.28 and .25 -.28, respectively. In summary, correlation between caloric expenditure and Physical Functioning was consistently higher in magnitude than those with Bodily Pain and Mental Health.

This study had lower correlations between caloric expenditure and SF-36 scales than the two previous studies, these results can be explained by the differences in sample characteristics. The samples in previous studies were healthy older adults residing in the community and retirement homes, whereas the sample in this study was patients with CAD residing in the community but recruited at hospital clinics. The feeling of being a patient may have been expressed in self-reporting health perception. It may explain underestimating the scores of SF-36 scales. The participants in this study had no limitation in activity as identified by functional class 1 as a criterion for participation in this study. However, more than 50% of participants stated that their health was either fair or poor. The items on these five scales (General Health, Physical Functioning, Bodily

Pain, Mental Health and Vitality) assessed participants' own perception of their health; this may explain the low correlation with the amount of physical activity.

Exercise Stages of Change (ESC)

Exercise Stages of Change is a single question with five-stage response choices identifying an individual's intention to do regular physical activity based on an activity recommendation from the Centers for Disease Control and Prevention (1996). Evaluation of clarity by seven experts and four focus groups resulted in no critical changes to this questionnaire. In Phase II, only one participant added his own answer that "he did some exercise but not regular yet"; this added answer should be coded as being in the preparation stage. However, to prevent bias from the researcher's interpretation, this answer was coded as missing data. Thus, it appears that the ESC questionnaire demonstrated good clarity.

The present study demonstrated that 55% of the participants were classified as regularly active in either the Action or Maintenance stages. Approximately 45% of participants in this study responded that they were not exercising yet. This finding was consistent with previous studies among Thai patients with CAD. Inkoom (1997) identified 42.5% of patients in her study as having never exercised. Several studies have demonstrated that exercise behavior among patients with CAD was at a fair or poor level (Inkoom, 1997; Ngaosornskul, 2000; Saiseesub, 2000). It is important to note that these studies did not measure intensity, duration, and frequency of actual activity that participants engaged in, but rather measured some activities relating to exercise such as warm-up and cool down before and after exercise, checking pulse before and after

exercise, or not having a meal right after and before exercise. Taken as a whole, the ESC is useful for Thai people with coronary artery disease.

Many studies have demonstrated concurrent validity of the Exercise Stages of Change with self-reported physical activity scales by examining mean differences across the stages (Armstrong, 1999; Buckworth & Wallace, 2002; Cardinal, 1995; Hellman, 1997; Sarkin et al., 2001). This study found that participants with CAD in Precontemplation had lower caloric expenditure at any intensity level of physical activity than those who were in the other four stages (Contemplation, Preparation, Action, and Maintenance). The caloric expenditure values were estimated from the CHAMPS questionnaire. The findings were consistent with previous studies. Hellman (1997) demonstrated similar findings among older adults with a cardiac diagnosis, related to exercise time. Cardinal (1995) used a self-report questionnaire of Seven Day Physical Activity Recall to validate exercise stages of change in middle-aged women, while Sarkin et al. (2001) used the Godin Leisure Time Exercise Questionnaire in a study of exercise stages of change in healthy adults with a BMI equal or greater than 25. Even though previous studies used different self-reported physical activity questionnaires, their findings of the concurrent validity were consistently showed significant mean differences across the stages of change.

In comparing the intensity of physical activity between Action and Maintenance stages of this study, the post hoc analysis showed no significant difference. The findings of this study were also consistent with previous research measuring the amount of physical activity within a week, which also presented no significant differences between

these two stages (Buckworth & Wallace, 2002; Sarkin et al., 2001). The previous studies were reported in overweight samples (mean age 50.9 ± 15) (Sarkin et al., 2001) and active college students (21.2 + 3.7 years) (Buckworth & Wallace, 2002). The amount of physical activity done in the last week or a typical week may not be able to identify a difference in physical activity between Action and Maintenance stages. The difference between Action and Maintenance stages is on the subject of adherence time to regular exercise (Less than 6 months for Action stage and more than 6 months for Maintenance stage). It is possible that no caloric expenditure differences between these two stages were found because of the recalled duration of physical activity.

However, significant differences in physical activity were found consistently between participants in exercise groups (Action or Maintenance stages) and those in non-exercise groups (Precontemplation, Contemplation, or Preparation). This suggests that the algorithm differentiated participants in Action and Maintenance stages from those in Precontemplation, Contemplation, or Preparation stages. This held true for all physical activities that participants reported, as well as for participants engaging in moderate intensity physical activity.

In summary, the one item with five-stage ESC questionnaire demonstrated validity by pattern of physical activity across stages. The patterns are consistent with the theoretical framework and consistent with the findings of previous studies. The ESC questionnaire may be appropriate for health promotion with regular moderate exercise using the Transtheoretical Model of Change as a theoretical framework.

Decisional Balance for Exercise

The eight original constructs of Decisional Balance initially described by Janis and Mann (1977) were not confirmed statistically by several studies that focused on physical activity (Marcus et al., 1992a; Myers & Roth, 1997; Nigg et al., 1999; Prochaska & Marcus, 1994). Therefore, this study used only the two factors of Pros and Cons scales to represent the Decisional Balance concept. Based on confirmatory factor analysis, 16 items loaded adequately on the two representative factors. The findings replicated the original scale and previous studies (Marcus et al., 1992a; Nigg et al., 1999). The constructs of the Decisional Balance measure were consistent with the previous studies and eight items together had good internal-consistency reliability. However, seven out of eight items on the Cons scale demonstrated very low variability and poor discrimination. This scale would have limited use as an outcome variable.

Thus, these items were meaningless as an outcome measures because they did not give any information about differences among participants (Allen & Yen, 1979). The reasons may be common knowledge of the well-established benefits of exercise. Especially in Thai culture, people seem to agree with general public norms and feelings expressed by Thai people. The participants were less likely to agree with Cons items even though they do not exercise. In an examination of several studies that applied TTM, Prochaska and Velicer (1997) demonstrated that the Cons T-scores decreased only .5 SD across stages from Precontemplation to Action while the Pros scores increased 1 SD. The small changes in the Cons scores may be a result of the restricted range of responses. The item analysis findings of this study demonstrated that less variability causes low

discrimination among participants. The Cons scale was deleted from the final decisional balance measure and the Pros scale was renamed as Positive Aspects of Exercise (PROS).

The eight Pros items renamed as PROS of Exercise demonstrated a good internal consistency estimation of reliability: Cronbach's alpha = .86. This value satisfied the minimum criterion of .7 set by Nunnally and Bernstein (1994). In previous studies, Nigg, et al (1999) had reported an alpha of .89 for a 5-item Pros scale (the original scale of this study) in healthy adults. Marcus, et al (1994) and Nigg and Courneya (1998) found alpha values of .79 and .92, respectively, for a 10-item Pros scale. Although number of items in each Pros scale was different, all Pros scales used in different samples demonstrated consistently good internal-consistency reliability by coefficient alpha.

The benefits of exercise are well-known, especially in CAD patients; therefore, it was not surprising that 4 out of the 8 Pros items were highly endorsed by more than 70% of participants in this study. However, the four items were also able to differentiate high-scoring participants from those with low-scores. In addition, the 8 items demonstrated a unidimensional construct by good factor loadings greater than .4 and a model fit with acceptable goodness of fit indexes. Only one item of "I would have better heart function if I exercise regularly" did not meet the criteria for item retention, but it was retained because of its clinical relevance.

Prochaska et al. (1994) demonstrated "principle of progress" in 12 behaviors from studies that applied TTM, including an exercise study. The principle indicates that the Pros scores substantially increase from Precontemplation to Action with a t-score (mean = 50 and SD = 10) of at least one standard deviation. An increase of one standard

deviation is considered to be large effect (Cohen, 1977). The finding of this study was consistent with the "principle of change" in that PROS t-scores increased approximately 16 points of t-score or a 1.5-standard deviation from the Precontemplation to the Action stage. Nigg, et al. (1999) also demonstrated increasing at least one standard deviation from a 5-item Pros scale in 352 adults. The PROS scale of this study demonstrated good construct validity and known-group validity.

The effect size between Precontemplation and Contemplation was large (.95). Therefore, the measure of PROS of Exercise would be a good outcome measure to detect changes between these stages. Prochaska suggests that participants in Precontemplation should be targeted to increase the perception of exercise benefits to move them to contemplation stage. Because of the deletion of the Cons items, the crossover point of Pros and Cons revealed between Preparation and Action stages could not be presented.

Processes of Change for Exercise

The aim of this study was to produce a brief and reliable questionnaire for measuring the ten processes of change for exercise. The ten scales of final Processes of Change for Exercise in this study demonstrated good internal-consistency reliability with coefficient alpha greater than .7 (Nunnally & Bernstein, 1994). This study reported alpha coefficients for the ten processes of change in the range of .72 to .89. Other studies have reported internal consistency coefficients ranging from .62 to .89 of 39-item scale with 4 items per scale except Dramatic Relief (Marcus et al., 1992b; Plotnikoff, 2002), and .67-.86 of 30-item scale with 3 items per scale (Nigg et al., 1999).

The PCE measure used in this study was modified from the measure used in Nigg et al. (1999). The original 3 items of the Dramatic Relief scale had marginal acceptable alpha coefficient of .69. In the present study coefficient alpha changed from .69 to .72 as a result of deleting an item of "I am afraid of the consequences to my health if I do not exercise." Moreover, factor loadings and variance of the three final items on the Dramatic Relief factor were better than the three original items together. Nigg and his colleagues (1999) reported factor loadings of the three original items per factor in the range of .45-.86, whereas, all items of the final measure in this study loaded ranging from .54 to .98. Overall, the final 30-item PCE measure generally demonstrated good reliability and construct validity for Thai middle-aged and older participants with CAD.

From the findings of Pairwise comparison analysis, participants in the Precontemplation stage used all 10 processes significantly less than participants in the other stages. These findings are consistent with previous studies (Marcus et al., 1992b; Nigg et al., 1999). Previous studies based on the TTM demonstrated that the experiential processes should have the highest score in the Action stage (Nigg & Courneya, 1998). In this study, no significant differences were found between participants in the Maintenance and Action stages for all experiential processes except for Dramatic Relief. These findings were consistent with previous studies (Nigg & Courneya, 1998; Nigg et al., 1998). Participants who had already started exercising had no significant differences in using experiential processes. Dramatic Relief scores decreased significantly from Action to Maintenance. This finding was consistent with previous studies (Courneya & McAuley, 1995; Marcus et al., 1992c; Nigg et al., 1998). Participants in the Maintenance

stage used intense emotional experience less than those in the Action stage. Previous studies reported no difference in the use of experiential processes between Preparation and Contemplation (Marcus et al., 1992b; Nigg & Courneya, 1998), however, this study demonstrated no significant mean differences only of Conciousness Raising, Dramatic Relief, and Self-reevaluation scales.

The Behavioral processes demonstrated no significant differences when comparing the Maintenance and Action stages. Significant differences between the Preparation and Action stages of five behavioral processes were consistent with previous studies, with the exception of the Helping Relationship scale. Marcus et al. (1992) demonstrated that for the five behavioral processes there were significant differences between Preparation and Action stages among adults in work places , whereas, Nigg et al. (1999) demonstrated significant differences for four behavioral processes among adults in communities. One behavioral process, Stimulus Control, did not demonstrate a significant difference.

Effect sizes of mean differences were examined to provide an indication of how differences of ten construct scores were differentiated across stages. Based on Cohen's classification, there were large effect sizes (.89 - 2.95) when comparing participants in the Precontemplation and Maintenance stages for all processes except Dramatic Relief scale (medium effect size of .65) All processes demonstrated marginal medium to large effect sizes (.48 – 1.1) except no meaningful of mean difference by effect size for an Environmental Evaluation scale (.39 with zero contained in 95% confident interval) when comparing participant in the Precontemplation and Contemplation stages. Three

Experiential processes were used more by participants in Preparation than those in Contemplation with small to medium effect sizes. Two experiential processes, Self reevaluation and Dramatic Relief, did not demonstrate this difference. Marcus et al. (1992) and Nigg et al. (1998, 1999) found no difference for all five experiential processes between these two stages.

Differences in using the ten processes across stages were not only statistically significant but also meaningful in magnitude. The PEC measure demonstrated good reliability and validity for Thai middle-aged and older adults with CAD. Moreover, this measure is appropriate to use as an outcome variable because it demonstrated meaningful mean differences by effect sizes.

Self-efficacy for Overcoming Barriers for Exercise (SEOBE)

The SEOBE as a multidimensional scale of 23-items of 6 scales demonstrated good reliability and validity when used with Thai middle-aged and older adults with CAD. The internal-consistency reliabilities of six scales were very good in the range of .83 to .9 (DeVellis, 2003). The findings of this study demonstrated that most of the items demonstrated good item difficulties of greater than .3 (Allen & Yen, 1979); only three items of the Bad weather scale had low item difficulty in the values of .19 (It is raining), .20 (The roads or sidewalks are slippery), and .21 (There is air pollution outside). The hot weather in Thailand is common weather that Thai people are used to. Only an item of "it is hot outside" had an acceptable item difficulty greater than .3. That means approximately 20% or less of participants were either very confident or completely confident that they could overcome these three situations or they did not encounter them.

Raining, slippery sidewalks, and air pollution are uncontrollable factors. It is possible that individuals have low self-efficacy in overcoming barriers that they believe exceed their ability (Bandura, 1997). The sample of this study had at least one chronic illness, CAD. Their response to the scale could also be explained by a concern regarding health risks in order to do exercise in inappropriate situations. The bad weather is an uncontrollable barrier, in another words, they believe that these barriers exceed their ability to overcome.

There is sufficient evidence to demonstrate the validity of the SEOBE scale using construct validity by confirmatory factor analysis and known-group differences. The 23 items of six subscales had good factor loadings on expected factors of greater than .4 with the variance explained from the related factors of greater than 50%. Based on this evidence, the SEOBE measure confirmed six constructs of the SEOBE questionnaire. Many studies using the Transtheoretical model have demonstrated that self-efficacy for exercise scores increased from Precontemplation to Maintenance stages (Armstrong, 1999; Gorely & Gordon, 1995; Herrick et al., 1997; Marcus & Owen, 1992; Marcus et al., 1992c; Marcus et al., 1994; Nigg & Courneya, 1998). The findings of increasing self-efficacy from Precontemplation to Maintenance were across age groups including adolescent to middle-aged (Herrick et al., 1997). The scores of SEOBE provided good magnitude of differences. The effect sizes in comparing across the five and three stages were medium to large except when comparing Action and Preparation stages, which were small. The findings revealed that the Thai SEOBE is a important outcome measure that can detect differences across stages.

Social Influences for Exercise

The modified Thai version of the Social Influence for Exercise scale composed of 15 items of Positive Social Influence (PSI) and 12 items of Negative Social Influence (NSI) demonstrated differences of participants' responses. NSI scales were eliminated because of restricted range of response, poor internal-consistency reliability, and poor item discriminations. The three scales of PSI had good internal-consistency reliability, construct validity, and magnitude of mean differences across the Exercise Stages of Change. The internal-consistency reliability estimated by Cronbach's alpha coefficient (α= .85-91) reached an acceptable level of greater than .7 (Nunnally & Bernstein, 1994) and item-remainder coefficient values (.57-.82) were in an acceptable range of .3 to .89. The findings indicated that the five items together in each scale are homogeneous within a scale. The PSI was renamed as Positive Social Influences on Exercise (PSIE). Because the original scale (Chogahara, 1999) measured social influences from three resources (family, friends, and health care professionals), the modified Thai version of Social Influence on Exercise asked in general of family and friends supports. The Cronbach coefficient alpha values of this study can not be compared with the three original scales of Social Influences on Exercise.

In addition, the PSIE scales demonstrated good variability and discrimination by the values of item difficulty and discrimination in an acceptable range of .3 -.7 and equal or greater than .3, respectively. The 15 items demonstrated that participants of this study had different levels of positive social influences from their family and friends. Each item

can differentiate people with low scores of social influence from those with high scores. As mentioned previously, this measure is important as an outcome measure.

The 15 items of PSIE scales loaded well on expected factors with factor loadings of greater than .4 (Nunnally & Bernstein, 1994). The findings confirmed that the positive social influences contained three subdimensions. Each scale also demonstrated significant differences across five and three exercise stages of change. The magnitudes of the differences were small to large. The findings identified that people in different stages received different amounts of positive supports from their family and friends. The original scale was newly developed but was selected because of good psychometric properties. Relationships across different groups of people have not yet been explored using the original scale. This study demonstrated that the positive social influence scales has good reliability and validity not only for Western adults from senior centers, aged 55 to 96 years old (Chogahara, 1999), but also for Thai adults middle-aged and older with CAD.

As described in Chapter 4, the 12 items of the Negative Social Influence scales were meaningless as outcome measures because of poor internal-consistency reliability, restricted range of the responses, and poor discrimination. These findings may be explained by the high value placed on harmony in Thai culture and well-established exercise benefits. Participants in this study had CAD, and they reported rarely receiving negative social influence from their family and friends. This may be due to conforming for normative reasons. Exercise has well-known established benefits for preventing CAD and declining its severity. In Thailand health care professionals and the media commonly

present the benefits of exercise. Social influence is a part of every day life, and can invade individual beliefs in dramatic ways. People who have low self-esteem may be particularly likely to conform to normative pressure because they fear rejection by the group. A Thai cultural value is related to group cohesiveness—meaning that they conform to the norms of the community (Hofstede, 1984). All items addressing the negative aspects of exercise in the Decisional Balance for Exercise and Social Influences for Exercise scale had restricted response ranges demonstrated by low item difficulties for each item. The cultural context, including the pressure of social norms, may have influenced participants' answers on the negative aspects to exercise. Therefore, the negative social influence scales were deleted.

Methodology

The aim of this study was to get appropriate measures related to exercise behavior for Thai middle-age and older with diagnosis of CAD. Measurement is "the assigning of numbers to individuals in a systematic way as a means of representing properties of the individual" (Allen & Yen, 1979). Therefore, it is important to evaluate the quality of a measure in terms of its usefulness, accuracy, and meaningfulness. Testing reliability and validity is a fundamental evaluation for all measurement. Not only testing internal consistency reliability, criterion and construct validity of the scales but also testing item variability and discrimination are required for identifying differences among participant's responses (Allen & Yen, 2002). Items with either low or high difficulty levels which do not allow for discrimination among participants were eliminated. The item deletion or retention of items within this study was based on a combination of item difficulty, item

discrimination, factor loading, clinical relevance, and Thai cultural issues. Some scales used in this study demonstrated acceptable internal-consistency reliability by the alpha coefficient and construct validity by confirmatory factor analysis. However, they could not distinguish differences among participants. In this case, the particular scale is meaningless as an outcome measure, and was eliminated. In addition, because internal consistency reliability depends upon the length of the measure, it is important to reevaluate reliability after item deletion Step by step verification of evaluation was very helpful for researchers in order to justify these measures as good assessment or outcome measures for further study.

According to Waltz, Strickland, and Lenz (1991), reliability should be evaluated before employing criterion-related validity such as concurrent validity or predictability. Criterion-validity was evaluated only for the final measures. Effect size implies strength, importance, and meaningfulness of findings (Pedhazur & Schmelkin, 1991). Bickman (1988) stated that "A statistically significant effect is sufficient for theoretical work, but a strong effect in needed for applied work". Based on Bickman's statement, researchers interested in health behavior are conscious of the meaningfulness of their findings because their findings will be applied to their population of interest. The effect sizes were examined in this study to indicate how well the constructs and measures differentiate across the stages algorithm. Most effect sizes findings were small to large, and were consistent with previous studies. Therefore, the six measures related to exercise are considered adequate to use as outcome variables and assessment tools.

Summary

In summary, the final questionnaires identified for research related to exercise among Thai middle-aged and older adults with coronary artery disease contained 38 items of the modified CHAMPS questionnaire, 8 items of the PROS of Exercise, 30 items of Processes of Change for Exercise, 23 items of Self-efficacy for Overcoming Barriers, and 15 items of Positive Social influences of Exercise. These measures demonstrated not only good psychometric properties (good internal-consistency reliability, variability, discrimination, construct validity, and concurrent validity) but also significant mean differences across the stages with good magnitude. These questionnaires are able to be used as outcome measures for future exercise research.

Limitations

The data for this study were cross-sectional in that responses on all measures were collected at one point in time. Cross-sectional studies are not able to detect change over time. Therefore the mean differences across stages cannot clarify the differences between the stages that are antecedents or consequences of change (Nigg & Courneya, 1998). A longitudinal study is required to assess changes over time and to evaluate changes on these measures across stages. The findings will provide better guidelines for exercise intervention.

This study used a convenience sample in both Phase I and II from a hospital in Bangkok and an institute in Nonthaburi province (suburban). This limits generalization of findings to other populations, such as patients with CAD who live in rural areas. It would be necessary to administer these measures to a large representative sample in order

to interpret the findings and establish norms for these measures for a larger CAD population.

The use of focus groups helps researcher to "gain insight into participants' feelings, opinions, and perceptions about a given problem, experience, service, program, or phenomenon" (Gray-Vickrey, 1993). In addition, focus group interviews provide some information that it would be difficult to obtain in an individual interview. Sharing and listening points of view among people related to item meaning and clarity lead to more understanding of item wordings. In conducting 4 focus groups to obtain the clarity of the questionnaires from discussion and interaction among population of interest, the researcher had some difficulties in geting the expected information. The problems were hospital setting and evaluation format. All participants came to the hospital for their doctor's appointments and exercise is well-known for reducing the risk of CAD. In the hospital setting, participants stated that it was difficult to express their thoughts against exercise. In addition, no evaluation format was applied for the focus groups. The evaluation format may be created similar to evaluation format of experts- asking participants to rate clarity of each item. That may be easier way to get their suggestions in text. Providing an evaluation format may help the researcher to gain more information for scale development.

The focus group findings of this study were based on the researcher's interpretation, and may contain bias from her experiences in conducting focus group discussion. Moreover, observation and note taking by only the focus moderator may result in the loss of some information. Even though the researcher confirmed her

summary of the focus group's suggestions to participants in order to validate the information, the participation of the four focus groups was not high. The focus group process needs to be modified in order to make participants more comfortable to talk. The researcher recommends that in future studies using the focus group method, the groups should be smaller (4-5 participants), and allow more time to create relationships with participants.

This study lacked other objective measures such as observation or physiological variables to validate the measure. For example, physical activity measure is a self-report measure. Dishman et al. (2000) suggested that physical activity as a multidimensional behavior should be measured by multiple assessment methods to capture all dimensions of physical activity. Other measures of this study are subjective self-report measures that by nature may be affected by participants' biases such as social desirability and environmental context. Future studies may consider using a social desirability scale and getting participants' responses by other data collection methods including mail survey or telephone interview.

The MET values used in this study were MET values modified to be appropriate for older adults (Stewart et al., 2001). Although this study recruited middle-aged and older adults with CAD, MET values may not appropriate for the population because the risks of exercise may outweigh the potential benefits. Some assigned MET values of activities may exceed the aerobic capacity of patients with CAD. The total caloric expenditure calculated in this study may be fairly overestimated, especially vigorous intensity level of physical activity.

The hospitals that data were collected are tertiary hospitals and well-established in term of quality of care for CAD. Approximately 61% of women with CAD reporting underlying selection of health care institute were distance from their home. They selected a hospital near their home. It may explain that 83.7% of participants in this study were men. The reasons underlying the selection of the health service agencies of two groups of women with CAD were close - by agency, and transportation accessibility 60.9% and 43.9% respectively.

Implications

The findings of this study provided preliminary evidence of factors related to physical activity and exercise. Importance of exercise benefits, strategies used to do exercise, belief in their competence to overcome barriers of exercise, and positive social influence from their friends and family identified in United States and also found in among Thai middle-aged and older adults with CAD are universal factors related to physical activity and exercise. Further, Exercise Stages of Change demonstrated great efficiency as a differential factor supported by small to large effect sizes across the stages.

Based on the findings of this study, the Thai version of Questionnaires for exercise research can be useful for exercise researchers who are interested in exercise promotion. If research would like to apply this framework for the future study in Thai population with CAD, the final measures can be used as either predictors of exercise behavior in exploratory study or an outcome measure for evaluation of an exercise intervention program. Exercise Stages of Change with criteria of moderate intensity exercise at a level that accumulates at least 30 minutes on most or preferably all days of

the week demonstrated is an important and useful assessment tool for both exercise researchers and clinicians who are interested in exercise promotion. The constructs of the Transtheoretical model were partially appropriate for Thai middle-aged and older adults with CAD. Each measure demonstrated consistent significant findings with the previous studies in Western countries. The PROS of Exercise measure demonstrated significant mean differences and small to large in magnitude of the mean differences across stages. Differences in using the ten processes between exercise groups and non exercise groups were noticeable, attaining both statistical significance and demonstrating meaningful differences. The Self-efficacy for Overcoming Barriers of Exercise measure demonstrated consistency with the framework; the scores increased significantly across the stages.

Only the negative aspects of social influence and decisional balance were influenced by culture. Thai culture values harmony and does not encourage expression of negative things related to others; therefore, the negative social influence scale demonstrated low variability and poor discrimination. Therefore, the negative aspects of exercise from questionnaires developed from Western culture may not capture these concepts among Thai people. Future study may need to apply qualitative method to understand these concepts.

Recommendation and future direction

All questionnaires in this study reported good internal-consistency reliability by Cronbach's alpha coefficient of at least .7. However, the scale will need to be monitored for alpha coefficient when it is used with the other samples and in other circumstances.

The findings of this study based on only Thai middle-aged and older with CAD. The findings could not be generalized to patients with other chronic illnesses. Further study need to explore similarity and difference between the sample of this study and other chronic illnesses such as cancer, diabetes, hypertension, or arthritis.

Due to differences on these variables between participants in Precontemplation and other stages, further intervention studies may needed to take these differences into consideration for sample recruitment. Based on the TTM, the Precontemplation group needs different interventions in order to stimulate their concern of being active. If an intervention is not a stage-matched intervention, the effectiveness of the intervention may be concealed by responses of participants in this stage.

Exploring the social influence scale to guide intervention is necessary to identify differences in support resources among friends, family, and health care professionals. The social influence scale probably needs to separate the resources in order to predict the score on exercise. This study did not provide this information because this study's aim was to confirm the construct of this measure.

The two negative aspects of exercise including the 8 Pro items of the Decisional Balance for Exercise scale and the12 items of the Negative Social Influence scale may need to be studied using different research methodologies. Negative aspects demonstrated a restricted range of responses, but it is too early to draw a conclusion that these sub-concepts did not work in Thai culture. In terms of scale development, these scales provide no information to identify difference among participants; therefore, they should

not in these measures. However, qualitative methods may provide more understanding of negative attitudes toward exercise and the meaning of these sub-concepts.

The modified CHAMPS questionnaire is a self-report measure. Because the amount of physical activity can vary across time, future studies using repeated measures may be useful. This method may helpful to evaluate the effectiveness of an intervention program, as distinguished from effects of confounding factors.

A stage-matched exercise intervention program may be a direction for future study. Because we are interested in participants' cognition and behavior it is important to assess the influence of social desirability and social norms on participants' responses on the measures. External criterion for item selection, such as social desirability, was not included in this study. However, exercise is well known as a good health behavior; therefore, it is possible to have items independent from social desirability. The researcher would recommend inclusion of other objective measures to demonstrate the results of these measures. Testing these questionnaires in samples with other types of chronic illnesses may be another direction in order to study the pattern of scale responses.

The optimal goal for a program of research is to develop an effective exercise intervention for the Thai population with CAD. Longitudinal studies are needed to identify how people change from stage to stage and to establish predictive reliability. However, a repeated measure method like tailored interventions, specific to the individuals' needs (Stage-based structured exercise packet) need to be developed from differences, using ten processes and influences of self-efficacy, positive aspects of exercise and positive social influence.

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APPENDIX A

LISTS OF EXPERTS FOR CONTENT VALIDITY

Lists of Experts for Content Validity

Seven experts validated the content and clarity of items corresponding with theoretical definitions. There are the following:

1. Experts of Research

1.1. Experts in exercise research

1.1.1. Assistant Professor Dr. Taweeluk Vannarit, Ph.D.
Department of Medical Nursing,
Faculty of Nursing, Chiang Mai University

1.1.2. Assistant Professor Dr. Vasal Kantaratanakul, MD. Certificate in Cardiac Rehabilitation
Chair of Department of Rehabilitation Medicine
Faculty of Medicine, Ramathibodi Hospital, Mahidol University

1.2. Experts in instrument development

1.2.1. Associate Professor Dr. Jariyawat Kompayak, Ph.D.
Dean of Faculty of Nursing, Huachiew Chalermprakiat University

1.2.2. Associate Professor Pensri Raberb, MS (Nursing)
Department of Surgical Nursing, Faculty of Nursing, Mahidol University

1.2.3. Dr. Chandeporn Jitpanya, Ph.D.
Faculty of Nursing, Chulalongkorn University

1.3. Expert in behavior research

1.3.1. Associate Professor Dr. Suthiluk Smitasiri

Director of Communication and Behavioral Science Division

Institute of Nutritional, Mahidol University

2. Cardiologist: Dr. Virat Kahasuckcherng

Central Chest Institute, Ministry of Public Health

APPENDIX B

QUESTIONNAIRES IN THAI AND ENGLISH VERSIONS

ผู้เข้าร่วมวิจัยหมายเลข.....

แบบสอบถาม

การออกกำลังกายสำหรับผู้ใหญ่วัยกลางคนถึงวัยสูงอายุ

ที่มีโรคหลอดเลือดเลี้ยงหัวใจ

ออกกำลังกาย

เพื่อสุขภาพ

แบบสอบถามนี้ไม่ยาวอย่างที่คุณเห็นนะคะ

โปรดอ่านคำชี้แจง ในหน้าถัดไป

ผู้เข้าร่วมวิจัยหมายเลข .....

คำชี้แจง

1. จำนวนหน้าของแบบสอบถามชุดนี้อาจจะดูเหมือนยาวมาก แต่ท่านจะพบว่าหลายๆหน้าท่านจะสามารถตอบผ่านไปได้อย่างรวดเร็ว

2. ข้อคำถามต่อไปนี้ได้จัดหาคำตอบที่มีความเป็นไปได้ ให้หลายคำตอบ และโดยทั่วไปจะมีเพียง**แค่หนึ่งคำตอบเท่านั้นที่เหมาะกับท่าน** โปรดให้คำตอบที่ใกล้เคียงกับความรู้สึกของท่านที่สุด ยกเว้นมีคำแนะนำให้ท่านข้ามข้อคำถามนั้น

3. ท่านมีสิทธิ์ที่จะไม่ตอบข้อคำถามใดๆ ที่ท่านรู้สึกไม่สะดวกใจที่จะตอบ อย่างไรก็ตาม การศึกษานี้จะได้รับประโยชน์อย่างมาก ถ้าได้รับความคิดเห็นของท่านในทุกข้อคำถาม

การตอบแบบสอบถามชุดนี้จะต้องอาศัยความพยายามของท่านในการตอบคำถามทั้งหมด
ข้อมูลของท่านจะเป็นประโยชน์สำหรับการค้นคว้าวิจัยในอนาคตเพื่อพัฒนาการออกกำลังกาย

ขอขอบคุณสำหรับความเต็มใจในการให้ข้อมูล

ผู้เข้าร่วมวิจัยหมายเลข .....

ระยะการเปลี่ยนแปลงพฤติกรรมการออกกำลังกาย

ข้อความทั้ง 5 ต่อไปนี้จะประเมินว่าในปัจจุบันนี้ท่านใช้เวลาว่างในการออกกำลังกายมากน้อยเพียงใด (การออกกำลังกายนอกเหนือจากงานประจำ)

การออกกำลังกาย เป็นกิจกรรมที่มีการเคลื่อนไหวของร่างกายที่ได้ถูกวางแผนกำหนดไว้เพื่อเพิ่มความแข็งแรงของร่างกาย เช่น การเดินเร็ว วิ่งเหยาะ ปั่นจักรยาน ว่ายน้ำ เต้นรำหรือกิจกรรมอื่นๆที่มีลักษณะคล้ายกัน

การออกกำลังกายสม่ำเสมอ หมายถึง **การออกกำลังกาย ที่สะสมในแต่ละวันเป็นเวลาอย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์** ในระดับที่ทำให้การหายใจเร็วขึ้นและมีเหงื่อออก

ตัวอย่างเช่น ในวันหนึ่งท่านเดินเร็วนาน 30 นาที 1 ครั้ง หรือเดินเร็วครั้งละ 10 นาที 3 ครั้ง ถ้าท่านปฏิบัติในระดับนี้เกือบทุกวันของสัปดาห์ ที่ทำให้การหายใจเร็วขึ้น และมีเหงื่อออก หมายความว่าท่านออกกำลังกายอย่างสม่ำเสมอ

ท่าน **ออกกำลังกายสม่ำเสมอ** ตามคำจำกัดความข้างต้นหรือไม่?

(การออกกำลังกาย ที่สะสมในแต่ละวันเป็นเวลาอย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์)

กรุณาเลือกตอบ**เพียงข้อเดียว**จาก 5 ตัวเลือกต่อไปนี้

- ☐ 1. ไม่, และฉัน**ไม่มีความตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอภายใน 6 เดือนข้างหน้า
- ☐ 2. ไม่, แต่ฉัน**ตั้งใจ**ว่าจะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในอีก 6 เดือนข้างหน้า**
- ☐ 3. ไม่, ฉัน**ตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในอีก 30 วันข้างหน้า**
- ☐ 4. ใช่, ฉันออกกำลังกายอย่างสม่ำเสมอมาแล้ว แต่**น้อยกว่า 6 เดือน**
- ☐ 5. ใช่, ฉันออกกำลังกายอย่างสม่ำเสมอมาแล้วเป็นเวลานาน**กว่า 6 เดือน**

ผู้เข้าร่วมวิจัยหมายเลข.....

อิทธิพลของสังคมที่มีต่อการออกกำลังกาย

ลองคิดถึงสิ่งต่างๆที่**ครอบครัวหรือเพื่อนๆกำลังปฏิบัติหรือได้ปฏิบัติมาในช่วงหนึ่งปีที่ผ่านมา** ให้คะแนนโดยคำนึงถึง**ความบ่อยครั้งของเหตุการณ์ที่เกิดขึ้น** กรุณาวงกลมล้อมรอบตัวเลขที่เหมาะสม **โปรดตอบคำถามโดยใช้ระดับคะแนนทั้ง 5 ดังต่อไปนี้**

0	1	2	3	4
ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ

ในช่วง 12 เดือนที่ผ่านมา ครอบครัวและเพื่อนๆ ของท่านปฏิบัติเช่นนี้ บ่อยครั้ง แค่ไหน

	ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ
1. วางแผนออกกำลังกายด้วยกันกับท่าน	0	1	2	3	4
2. เตือนท่านว่าการเริ่มออกกำลังกายจะทำให้สุขภาพแย่ลง.....	0	1	2	3	4
3. ตัดสินว่าพวกเขาจะออกกำลังกายกับท่าน	0	1	2	3	4
4. บอกท่านว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะท่านมีสุขภาพดีเพียงพอแล้ว....	0	1	2	3	4
5. เปลี่ยนแปลงตารางเวลาของพวกเขาเพื่อให้ท่านสามารถออกกำลังกายได้ด้วยกันกับพวกเขา.....	0	1	2	3	4
6. ไม่ให้ท่านออกกำลังกายร่วมด้วยเพราะท่านมีความสามารถในการออกกำลังกายน้อย...	0	1	2	3	4
7. อธิบายให้ท่านทึ่งว่าทำไมการออกกำลังกายจึงสำคัญต่อการเปลี่ยนแปลงสุขภาพของท่าน.....	0	1	2	3	4
8. บอกท่านให้หลีกเลี่ยงการออกกำลังกายเพื่อจะได้ไม่หกล้มหรือได้รับอุบัติเหตุ.....	0	1	2	3	4
9. แนะนำโปรแกรมและสถานที่สำหรับการออกกำลังกายที่ส่งเสริมให้ท่านมีสุขภาพดี.....	0	1	2	3	4
10. บอกท่านว่าไม่จำเป็นต้องออกกำลังกายเพิ่มขึ้นอีกเพราะท่านมีงานประจำอื่นๆที่รุ่มวายมากพออยู่แล้ว.....	0	1	2	3	4
11. ชมว่าท่านมีความสามารถในการออกกำลังกายของท่านดีกว่าคนอื่นๆที่อยู่ในวัยเดียวกัน.....	0	1	2	3	4

S-1

ผู้เข้าร่วมวิจัยหมายเลข .....

ในช่วง 12 เดือนที่ผ่านมา, ครอบครัวและเพื่อนๆ ของท่านปฏิบัติเช่นนี้ บ่อยครั้ง แค่ไหน					
	ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ
12. บังคับให้ท่านออกกำลังกายแบบที่ท่านไม่ชอบ....	0	1	2	3	4
13. **ชื่นชมกับความสามารถในการออกกำลังกายได้หลายประเภทของท่าน**.....	0	1	2	3	4
14. วิจารณ์ว่าท่านมีทักษะในการออกกำลังกายน้อย.....	0	1	2	3	4
15. **ออกกำลังกายด้วยกันกับท่าน**.....	0	1	2	3	4
16. บอกให้ท่านหลีกเลี่ยงการออกกำลังกายเพื่อหลีกเลี่ยงการบาดเจ็บหรือทำให้สุขภาพแย่ลง.....	0	1	2	3	4
17. **ให้ความกระจ่างถึงวิธีที่จะบรรลุเป้าหมายสุขภาพดีด้วยการออกกำลังกาย**.....	0	1	2	3	4
18. ห้ามไม่ให้ท่านออกกำลังกายเพราะมีความเสี่ยงต่อสุขภาพ.....	0	1	2	3	4
19. **อธิบายให้ท่านทราบถึงระยะเวลา ความถี่ หรือความหนักเบาของการออกกำลังกายที่จำเป็นในการทำให้สุขภาพดีขึ้น**.....	0	1	2	3	4
20. บอกท่านว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะท่านรู้จักวิธีดูแลสุขภาพตนเองดีอยู่แล้ว.....	0	1	2	3	4
21. **เตือนท่านให้ร่วมออกกำลังกายกับพวกเขา**.....	0	1	2	3	4
22. บอกท่านว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะไม่เหมาะสมกับวัยของท่าน.....	0	1	2	3	4
23. **ให้ข้อมูลเกี่ยวกับผลดีของการออกกำลังกายที่มีต่อสุขภาพของท่าน**.....	0	1	2	3	4
24. ยืนยันว่าท่านออกกำลังกายได้ดี.....	0	1	2	3	4
25. **บ่นว่าทักษะในการออกกำลังกายของท่านไม่ดีพอ**.....	0	1	2	3	4
26. กล่าวว่าท่านควรภูมิใจในทักษะการออกกำลังกายของท่าน.....	0	1	2	3	4
27. **ชมเชยการมีทักษะที่ดีในการออกกำลังกายของท่าน**.....	0	1	2	3	4

ผู้เข้าร่วมวิจัยหมายเลข.....

กระบวนการในการปรับเปลี่ยนพฤติกรรมการออกกำลังกาย

กบางคนคิด รู้สึก หรือปฏิบัติ สิ่งต่างๆต่อไปนี้ซึ่งมีผลกระทบต่อนิสัยการออกกำลังกาย นึกถึงประสบการณ์ที่ท่านอาจจะกำลังทำอยู่หรือได้ทำมาแล้วในระหว่างเดือนที่ผ่านมา ให้คะแนนโดยคำนึงว่า **เหตุการณ์นั้นเกิดขึ้นบ่อยเพียงใด** กรุณาวงกลมล้อมรอบตัวเลขที่เหมาะสม กรุณาตอบคำถามโดยใช้ระดับคะแนนทั้ง 5 ดังต่อไปนี้

0	1	2	3	4
ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ

ในช่วงเดือนที่ผ่านมา ท่านเคยคิด รู้สึกหรือปฏิบัติ สิ่งต่างๆต่อไปนี้ บ่อยครั้ง แค่ไหน

	ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ
1. ฉันอ่านเรื่องเกี่ยวกับการออกกำลังกายเพื่อที่จะเรียนรู้ให้มากขึ้น.....	0	1	2	3	4
2. ฉันค้นหาข้อมูลเกี่ยวกับการออกกำลังกาย.....	0	1	2	3	4
3. ฉันค้นหาวิธีการใหม่ๆของการออกกำลังกาย...	0	1	2	3	4
4. ฉันพูดคุยกับคุณหมอที่ดูแลฉันเกี่ยวกับการออกกำลังกาย.....	0	1	2	3	4
5. ฉันรู้สึกหงุดหงิดเมื่อเห็นคนที่คาดว่าจะได้รับผลดีจากการออกกำลังกายแต่กลับเลือกที่จะไม่ทำ.....	0	1	2	3	4
6. ฉันกลัวผลเสียต่อสุขภาพที่จะเกิดตามมาถ้าไม่ออกกำลังกาย.....	0	1	2	3	4
7. ฉันรู้สึกอารมณ์เสียที่คนที่อันที่จริงน่าจะมีสุขภาพดีกว่านี้ถ้าเขาออกกำลังกาย.....	0	1	2	3	4
8. ฉันกังวลใจว่าฉันอาจจะหัวใจวายได้ เช่นเดียวกับคนอื่นๆที่ไม่ออกกำลังกาย.....	0	1	2	3	4
9. ฉันตระหนักดีว่าถ้าไม่ออกกำลังกายอย่างสม่ำเสมอฉันอาจจะป่วยและเป็นภาระแก่ผู้อื่น.....	0	1	2	3	4
10. ฉันคิดว่าการออกกำลังกายอย่างสม่ำเสมอจะช่วยให้ฉันไม่ต้องเป็นภาระต่อระบบการดูแลสุขภาพอนามัย.....	0	1	2	3	4

ผู้เข้าร่วมวิจัยคนที่.....

ในช่วงเดือนที่ผ่านมา ท่านเคยคิด รู้สึกหรือปฏิบัติ สิ่งต่าง ๆต่อไปนี้ บ่อยครั้งเพียงใด					
	ไม่เคย	นาน ๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ
11. ฉันคิดว่าการออกกำลังกายอย่างสม่ำเสมอ ช่วยลดค่าใช้จ่ายในการรักษาพยาบาล.....	0	1	2	3	4
12. ฉันตระหนักว่าการที่ฉันออกกำลังกายอย่าง สม่ำเสมอจะเป็นแบบอย่างที่ดีแก่ลูกหลาน.....	0	1	2	3	4
13. ฉันมีความมั่นใจตนเองมากขึ้น เมื่อฉันออกกำลังกาย สม่ำเสมอ.....	0	1	2	3	4
14. ฉันเชื่อว่าการออกกำลังกายอย่างสม่ำเสมอจะ ทำให้ฉันมีสุขภาพดีและมีความสุขมากขึ้น....	0	1	2	3	4
15. ฉันมีความรู้สึกที่ดีต่อตนเองดีขึ้นเมื่อออกกำลังกาย....	0	1	2	3	4
16. ฉันรู้สึกว่ากำลังเอาใจใส่ในสุขภาพของ ตนเอง เมื่อฉันออกกำลังกายสม่ำเสมอ.....	0	1	2	3	4
17. ฉันสังเกตว่าคนส่วนใหญ่รู้ว่าการออกกำลังกายดี สำหรับพวกเขา.....	0	1	2	3	4
18. ฉันตระหนักว่าการออกกำลังกายเป็นส่วนหนึ่ง ของชีวิตผู้คนมากขึ้น.....	0	1	2	3	4
19. ฉันสังเกตว่าผู้ที่มีชื่อเสียงมักประชาสัมพันธ์ตนเอง ว่าออกกำลังกายสม่ำเสมอ.....	0	1	2	3	4
20. ฉันตระหนักว่ามีกิจกรรมการออกกำลังกาย มากขึ้นที่ชมรมผู้สูงอายุในชุมชนของฉัน.....	0	1	2	3	4
21. เมื่อฉันรู้สึกเหนื่อยล้า จะไปออกกำลังกายเพราะ ทำให้รู้สึกดีขึ้นหลังจากนั้น.....	0	1	2	3	4
22. ฉันเลือกที่จะออกกำลังกายแทนที่จะจิบสักครู่ หลังการทำงาน.....	0	1	2	3	4
23. ฉันจะเดินหรือออกกำลังกายแทนที่จะพักผ่อนด้วยการ ดูโทรทัศน์หรือรับประทานอาหาร.....	0	1	2	3	4
24. ฉันจะออกกำลังกาย เมื่อรู้สึกเศร้าโศกเสียใจ	0	1	2	3	4

ผู้เข้าร่วมวิจัยหมายเลข .....

ในช่วงเดือนที่ผ่านมา ท่านเคยคิด รู้สึกหรือปฏิบัติ สิ่งต่างๆต่อไปนี้ บ่อยครั้งเพียงใด					
	ไม่เคย	นานๆครั้ง	เป็นครั้งคราว	บ่อยๆ	สม่ำเสมอ
25. ฉันมีเพื่อนคอยให้กำลังใจให้ฉันออกกำลังกาย ในยามที่ฉันไม่อยากทำ.....	0	1	2	3	4
26. เพื่อนๆให้การสนับสนุนให้ฉันออกกำลังกาย.....	0	1	2	3	4
27. ฉันมีคนคอยให้กำลังใจในการออกกำลังกาย.....	0	1	2	3	4
28. ฉันมีคนไปออกกำลังกายด้วย.....	0	1	2	3	4
29. ฉันคิดว่าประโยชน์อย่างหนึ่งของการออกกำลังกายอย่างสม่ำเสมอคือทำให้ฉันมีอารมณ์ดี.....	0	1	2	3	4
30. ฉันคิดว่าช่วงเวลาที่ออกกำลังกายเป็นเวลาที่ทำให้จิตใจปลอดโปร่งและร่างกายแข็งแรงไปพร้อมๆกัน...	0	1	2	3	4
31. ฉันพบว่า ถ้าฉันออกกำลังกายอย่างสม่ำเสมอ ฉันรู้สึกมีกำลังวังชาเพิ่มขึ้น.....	0	1	2	3	4
32. ฉันชอบการได้คบหาสมาคมกับบุคคลอื่น ขณะที่ฉันไปออกกำลังกาย.....	0	1	2	3	4
33. ฉันบอกตัวเองว่า ถ้าฉันพยายามมากเพียงพอ ฉันจะออกกำลังกายได้อย่างสม่ำเสมอ.....	0	1	2	3	4
34. ฉันให้คำมั่นสัญญาแก่ตนเองว่าจะออกกำลังกาย.....	0	1	2	3	4
35. ฉันเชื่อว่าฉันสามารถออกกำลังกายได้อย่างสม่ำเสมอ.....	0	1	2	3	4
36. ฉันได้บอกคนอื่นๆว่า ฉันมีคำมั่นสัญญากับตัวเองว่าจะออกกำลังกาย.....	0	1	2	3	4
37. ฉันกำหนดตารางการออกกำลังกายไว้ในปฏิทิน...	0	1	2	3	4
38. ฉันเก็บเสื้อผ้าที่ใช้ในการออกกำลังกายไว้ในที่สะดวกเพื่อที่จะได้หยิบใช้ทันทีที่ฉันต้องการออกกำลังกาย.....	0	1	2	3	4
39. ฉันตรวจเช็คให้แน่ใจว่ามีเสื้อผ้าที่สะอาดพร้อมสำหรับการออกกำลังกายอยู่เสมอ.....	0	1	2	3	4
40. ฉันวางสิ่งกระตุ้นเตือนให้ออกกำลังกายไว้ตามที่ต่างๆในบ้าน เช่น คำคมหรือภาพการออกกำลังกาย.....	0	1	2	3	4

ผู้เข้าร่วมวิจัยหมายเลข .....

ดุลยพินิจในการตัดสินใจสำหรับการออกกำลังกาย

โปรดอ่านข้อความแต่ละข้อต่อไปนี้ แล้วพิจารณาบอกระดับความสำคัญต่อการตัดสินใจของท่าน ที่จะออกกำลังกายในยามว่างหรือไม่ โดยวงกลมล้อมรอบตัวเลขที่เหมาะสม กรุณาตอบคำถาม โดยใช้ระดับคะแนนทั้ง 5 ดังต่อไปนี้

0	1	2	3	4
ไม่สำคัญเลย	สำคัญบ้าง	สำคัญปานกลาง	สำคัญมาก	สำคัญที่สุด

ถ้าท่านไม่เห็นด้วยกับประโยคต่างนี้หรือไม่แน่ใจว่าจะตอบคำถามอย่างไรเพราะความข้อความนี้อาจจะไม่สำคัญเลยสำหรับท่าน

ท่านคิดว่าข้อความต่อไปนี้ มีความสำคัญในระดับใด ต่อการตัดสินใจที่จะออกกำลังกายของท่าน

	ไม่สำคัญเลย	สำคัญบ้าง	สำคัญปานกลาง	สำคัญมาก	สำคัญที่สุด
1. ฉันจะรู้สึกมีเรี่ยวแรงมากขึ้นให้กับการทำกิจกรรมต่างๆ ร่วมกับครอบครัวและเพื่อนๆ ถ้าฉันออกกำลังกายสม่ำเสมอ.....	0	1	2	3	4
2. ฉันจะรู้สึกลำบากใจถ้ามีคนเห็นฉันออกกำลังกาย....	0	1	2	3	4
3. ฉันจะรู้สึกเครียดน้อยลงถ้าฉันออกกำลังกายสม่ำเสมอ.	0	1	2	3	4
4. การออกกำลังกายทำให้ฉันมีเวลาให้เพื่อนๆ น้อยลง.....	0	1	2	3	4
5. ฉันมีจินตภาพที่ดีขึ้นภายหลังการออกกำลังกาย.....	0	1	2	3	4
6. ฉันรู้สึกอึดอัดหรือลายเมื่อสวมชุดออกกำลังกาย.....	0	1	2	3	4
7. ฉันรู้สึกสบายตัวขึ้น ถ้าออกกำลังกายอย่างสม่ำเสมอ...	0	1	2	3	4
8. ฉันจะต้องเรียนรู้สิ่งหลายอย่างเกินไปเพื่อการออกกำลังกาย.....	0	1	2	3	4
9. การออกกำลังกายอย่างสม่ำเสมอจะช่วยให้ฉันมองชีวิตในแง่ดีมากขึ้น.....	0	1	2	3	4
10. การออกกำลังกายเพิ่มภาระต่อสามี/ภรรยาของฉัน.....	0	1	2	3	4
11. ถ้าฉันออกกำลังกายอย่างสม่ำเสมอจะทำให้ฉันมีกระดูกและกล้ามเนื้อที่แข็งแรงขึ้น.....	0	1	2	3	4
12. ฉันรู้สึกอายเกินไปที่จะออกกำลังกายร่วมกับผู้อื่น..	0	1	2	3	4

ผู้เข้าร่วมวิจัยหมายเลข.....

ท่านคิดว่าข้อความต่อไปนี้ มีความสำคัญในระดับใด ต่อการตัดสินใจที่จะออกกำลังกายของท่าน					
	ไม่สำคัญเลย	สำคัญน้อย	สำคัญปานกลาง	สำคัญมาก	สำคัญที่สุด
13. หัวใจของฉันจะทำงานดีขึ้นถ้าฉันออกกำลังกายอย่างสม่ำเสมอ.....	0	1	2	3	4
14. ฉันจะรู้สึกปวดเมื่อยหรือไม่สบายถ้าการออกกำลังกาย...	0	1	2	3	4
15. การออกกำลังกายทำให้ฉันได้เพื่อนร่วมทำกิจกรรมอื่นๆ	0	1	2	3	4
16. ฉันคิดว่าหนักว่าสุขภาพของฉันไม่ดีพอที่จะออกกำลังกาย.....	0	1	2	3	4

ข้อมูลของท่านมีคุณค่าอย่างยิ่ง ขอขอบคุณในความร่วมมือและความตั้งใจตอบคำถาม กรุณาเปิดไปหน้าต่อไปค่ะ

ผู้เข้าร่วมวิจัยหมายเลข .....

ความเชื่อมั่นในสมรรถนะของตนเองเพื่อเอาชนะอุปสรรคในการออกกำลังกาย

โปรดพิจารณาถึง**ความมั่นใจของท่านในการที่จะออกกำลังกาย เมื่อท่านเผชิญกับอุปสรรค**ต่าง ๆ อ่านข้อความต่อไปนี้ แล้วกรุณาล้อมรอบตัวเลขที่ตรงกับความคิดเห็นของท่านที่สุด กรุณาตอบคำถามโดยใช้ระดับคะแนนทั้ง 5 ดังต่อไปนี้

0	1	2	3	4
ไม่มีความมั่นใจเลย	มีความมั่นใจบ้าง	มีความมั่นใจปานกลาง	มั่นใจมาก	มั่นใจที่สุด

ถ้าท่านไม่มีอุปกรณ์ตามประโยคเหล่านี้ หมายความว่าถึงแม้ท่านมีความมั่นใจที่สุดที่จะไปออกกำลังกาย

ท่านมีความมั่นใจในระดับใด ที่จะออกกำลังกายได้อย่างสม่ำเสมอ ถึงแม้ว่า...

	ไม่มั่นใจเลย	มั่นใจบ้าง	มั่นใจปานกลาง	มั่นใจมาก	มั่นใจที่สุด
1. ท่านรู้สึกเครียดมาก.....	0	1	2	3	4
2. ท่านรู้สึกหดหู่ ซึมเศร้า.....	0	1	2	3	4
3. ท่านรู้สึกวิตกกังวล.....	0	1	2	3	4
4. ท่านรู้สึกแก่เกินไป.....	0	1	2	3	4
5. ท่านรู้สึกว่าท่านไม่มีเวลา.....	0	1	2	3	4
6. ท่านรู้สึกไม่อยากออกกำลังกายในขณะนี้.....	0	1	2	3	4
7. ท่านยุ่งกับงานประจำ.....	0	1	2	3	4
8. ท่านรู้สึกไม่สบายตัวเมื่อท่านออกกำลังกาย...	0	1	2	3	4
9. ท่านกำลังประสบกับปัญหาส่วนตัวหรือครอบครัว	0	1	2	3	4
10. ท่านอยู่ลำพังคนเดียว.....	0	1	2	3	4
11. ท่านต้องออกกำลังกายตามลำพัง.....	0	1	2	3	4
12. เพื่อนที่ออกกำลังกายด้วยกันตัดสินใจไม่ออกกำลังกายในวันนั้น	0	1	2	3	4
13. ท่านขาดอุปกรณ์ในการออกกำลังกาย.....	0	1	2	3	4
14. ท่านต้องเดินทางไปไกลบ้านบ่อย ๆ.....	0	1	2	3	4
15. การเดินทางไม่สะดวก	0	1	2	3	4
16. สภาพแวดล้อมไม่ปลอดภัย.....	0	1	2	3	4
17. เพื่อนๆ ไม่ต้องการให้ท่านออกกำลังกาย.....	0	1	2	3	4
18. ครอบครัวของท่านไม่ต้องการให้ท่านออกกำลังกาย.	0	1	2	3	4
19. ท่านใช้เวลากับเพื่อนหรือครอบครัวที่ไม่ชอบออกกำลังกาย.	0	1	2	3	4
20. ฝนกำลังตก.....	0	1	2	3	4
21. อากาศร้อนเกินไป.....	0	1	2	3	4
22. อากาศมีมลพิษ	0	1	2	3	4
23. ถนนหรือทางเดินเท้าลื่น.....	0	1	2	3	4

ผู้เข้าร่วมวิจัยหมายเลข .....

กิจกรรมการเคลื่อนไหวออกแรง

ต่อไปนี้เป็นคำถามเกี่ยวกับกิจกรรมต่างๆที่ท่านได้ทำไปแล้วในระยะ 4 สัปดาห์ที่ผ่านมา

คำชี้แจง

ขั้นที่ 1 ถ้าท่านได้ทำกิจกรรมนั้น ๆใน 4 สัปดาห์ที่ผ่านมาทำเครื่องหมาย X ในช่องข้อความ "ใช่"

ขั้นที่ 2 ทำเครื่องหมาย X ในช่องจำนวนชั่วโมงทั้งหมดในหนึ่งสัปดาห์ ที่ท่านทำกิจกรรมดังกล่าว **โปรดพิจารณาจำนวนชั่วโมงจากสัปดาห์ทั่ว ๆไป** กรุณาปัดเศษของเวลาให้ใกล้เคียงกับตัวเลือกที่กำหนดให้

ขั้นที่ 3 ถ้าท่านไม่ได้ทำกิจกรรมนั้น ๆใน 4 สัปดาห์ที่ผ่านมา กรุณาทำเครื่องหมาย X ในช่องข้อความ "ไม่ใช่" และข้ามไปตอบข้อคำถามถัดไป

ต่อไปนี้คือตัวอย่างที่คุณสุเทพ ตอบคำถามข้อที่ 1

โดยปกติคุณสุเทพจะไปหาเพื่อนคือ คุณนิรมลและคุณสมพงศ์ 2 ครั้งต่อสัปดาห์ เขาใช้เวลาหนึ่งชั่วโมงกับคุณนิรมลในวันจันทร์ และสองชั่วโมงกับคุณสมพงศ์ในวันพุธ ดังนั้นจำนวนชั่วโมงที่คุณสุเทพใช้กับเพื่อนทั้งหมดคือ**สามชั่วโมงต่อสัปดาห์** ถึงแม้ในบางสัปดาห์คุณสุเทพ ติดราชการและไม่ได้ไปหา เพื่อนในสัปดาห์ที่ 2 ของเดือน แต่โดยทั่วไปเขาปฏิบัติเช่นนี้

ดังนั้น คุณสุเทพจึงตอบคำถามข้อที่ 1 ดังตัวอย่าง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...						
1. ไปเยี่ยมเพื่อน ๆหรือกรอบครัว (ไม่รวมคนที่คุณอาศัยอยู่ด้วย)						
☐ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ ☒ ใช่ โดยทั่วๆไปในแต่ละสัปดาห์ คุณได้ทำเป็นเวลารวม... →	น้อยกว่า 1 ชั่วโมง	1-2 ชั่วโมง	3-4 ชั่วโมง	5-6 ชั่วโมง	7-8 ชั่วโมง	มากกว่า 9 ชั่วโมง

ผู้เข้าร่วมวิจัยหมายเลข .....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

	น้อยกว่า 1 ชั่วโมง	1-2.5 ชั่วโมง	3-4.5 ชั่วโมง	5-6.5 ชั่วโมง	7-.5 ชั่วโมง	มากกว่า 9 ชั่วโมง
1. ไปเยี่ยมเพื่อน ๆหรือครอบครัว (ไม่รวมคนที่ท่านอาศัยอยู่ด้วย)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
2. ไปชมรมผู้สูงอายุ						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
3. ทำงานอาสาสมัคร						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
4. ช่วยดูแลศาสนสถาน เช่น กวาดลานวัด						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
5. เข้าร่วมกิจกรรมของสโมสรหรือการพบปะประชุมกลุ่ม เช่น กิจกรรมโรตารี ลูกเสือชาวบ้าน						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
6. ใช้คอมพิวเตอร์						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
7. เต้นรำ (ยกเว้นการเต้นแอโรบิก)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						
8. ทำงานฝีมือ เช่น งานไม้ งานเย็บ วาดภาพ และงานศิลปะ						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม→						

ผู้เข้าร่วมกิจกรรมลำดับที่.....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

	น้อยกว่า 1 ชั่วโมง	1-2.5 ชั่วโมง	3-4.5 ชั่วโมง	5-6.5 ชั่วโมง	7-.5 ชั่วโมง	มากกว่า 9 ชั่วโมง
9. เล่นกอล์ฟพร้อมลากอุปกรณ์ด้วยตนเอง(นับเฉพาะช่วงเวลาที่เดิน)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
10. เล่นกอล์ฟโดยอาศัยรถกอล์ฟ (นับเฉพาะช่วงเวลาที่เดิน)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
11. ไปดูการแข่งขันกีฬา, ภาพยนตร์, ฟังการบรรยาย, คอนเสิร์ต						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
12. เล่นไพ่ เกมส์บิงโก หรือพนากระดานกับคนอื่นๆ หรือกับลูกหลาน						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
13. แทงสนุกเกอร์หรือบิลเลียด						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
14. เล่นเทนนิสเดี่ยว (ไม่นับเทนนิสคู่)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
15. เล่นเทนนิสคู่ (ไม่นับเทนนิสเดี่ยว)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						
16. เล่นดนตรี						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่→ โดยทั่วๆไปในแต่ละสัปดาห์ **ท่านได้ทำเป็นเวลารวม**→						

ผู้เข้าร่วมวิจัยหมายเลข .....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

	น้อยกว่า 1 ชั่วโมง	1-2.5 ชั่วโมง	3-4.5 ชั่วโมง	5-6.5 ชั่วโมง	7-.5 ชั่วโมง	มากกว่า 9 ชั่วโมง
17. ล่าบหนังสือ						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
18. ทำงานบ้านอย่างหนัก เช่น เช็ดถูพื้นภายในบ้าน ล้างหน้าต่าง หรือ ทำความสะอาดรางน้ำฝน						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
19. ทำงานบ้านเบา ๆ เช่น กวาดบ้าน ให้อาหารสัตว์เลี้ยง						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
20. ทำงานสวนอย่างหนัก เช่น ยกของหนัก , ขุดดินโดยใช้จอบ หรือเสียม, กวาดด้วยกราด						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
21. ทำสวนเบาๆ เช่น รดน้ำต้นไม้						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
22. ดูแลซ่อมเกี่ยวกับรถยนต์ รถบรรทุก รถตัดหญ้าหรือเครื่องจักรอื่นๆ						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
23. วิ่งเหยาะ ๆ หรือวิ่งเร็ว						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
24. เดินเร็วเพื่อออกกำลังกาย (ไม่นับเวลาเดินเล่น)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						

ผู้เข้าร่วมวิจัยหมายเลข.....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

	น้อยกว่า 1 ชั่วโมง	1-2.5 ชั่วโมง	3-4.5 ชั่วโมง	5-6.5 ชั่วโมง	7-.5 ชั่วโมง	มากกว่า 9 ชั่วโมง
25. เดินเพื่อไปทำธุระ เช่น ไปร้านค้า หรือพาเด็ก ๆ ไปโรงเรียน						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
26. เดินเล่นยามว่างเพื่อออกกำลังกายหรือความเพลิดเพลิน เช่น เดินสมาธิ เดินหลังรับประทานอาหาร						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
27. ขี่จักรยาน หรือปั่นจักรยานอยู่กับที่						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
28. ใช้เครื่องช่วยออกกำลังกายแบบแอโรบิก เช่น ชั้นบันได (ไม่รวมลู่วิ่งสายพานหรือจักรยานปั่น)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
29. เล่นออกกำลังกายในน้ำ (ไม่รวมการว่ายน้ำ)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
30. ว่ายน้ำช้า ๆ						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
31. เล่นกีฬาแบบยืดหยุ่นกล้ามเนื้อ (ไม่นับโยคะหรือไทเก๊ก)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
32. เล่นโยคะหรือไทเก๊ก						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						

ผู้เข้าร่วมวิจัยหมายเลข.....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

	น้อยกว่า 1 ชั่วโมง	1-2.5 ชั่วโมง	3-4.5 ชั่วโมง	5-6.5 ชั่วโมง	7-.5 ชั่วโมง	มากกว่า 9 ชั่วโมง
33. เต้นแอโรบิก						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
34. ฝึกความแข็งแรงของกล้ามเนื้อในระดับเบา เช่น ยกน้ำหนัก น้อยกว่า 2.5 กิโลกรัม หรือ ใช้ไม้พลอง						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
35. ฝึกความแข็งแรงของกล้ามเนื้อในระดับปานกลางถึงหนัก เช่น ยกน้ำหนักมากกว่า 2.5 กิโลกรัม หรือ วิดพื้น						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
36. ออกกำลังกายเพื่อคงสภาพกล้ามเนื้อ เช่น ออกกายบริหาร ออกกำลังโดยใช้เก้าอี้ (ไม่รวมการออกกำลังกายเพื่อเพิ่มความแข็งแรงของกล้ามเนื้อ)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						
37. เล่นบาสเกตบอล หรือฟุตบอล (ไม่รวมเวลาของสนาม)						
❑ ไม่ใช่ → กรุณาข้ามไปตอบคำถามต่อไปค่ะ						
❑ ใช่ → โดยทั่วๆไปในแต่ละสัปดาห์ ท่านได้ทำเป็นเวลารวม →						

ผู้เข้าร่วมวิจัยหมายเลข.....

กิจกรรมการเคลื่อนไหวออกแรง

ในช่วง 1 เดือนที่ผ่านมานี้ โดยทั่วๆไปในแต่ละสัปดาห์ท่านได้...

38. กิจกรรมเดินๆที่ท่านได้ปฏิบัติ **โปรดระบุ กิจกรรมและจำนวนชั่วโมงต่อสัปดาห์**

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39. โดยทั่วๆไป ท่านได้ทำกิจกรรมการเคลื่อนไหวออกแรงเป็นเวลา **อย่างน้อย 30 นาทีต่อวัน ซึ่งทำให้ท่านมีการหายใจเร็วขึ้นและมีเหงื่อออก** เป็นจำนวนกี่วันในหนึ่งสัปดาห์?

.....วันในหนึ่งสัปดาห์

ขอขอบคุณนะคะที่ให้ความร่วมมืออย่างดี
ในการตอบคำถามเหล่านี้

ผู้เข้าร่วมวิจัยหมายเลข.....

คุณภาพชีวิต

โปรดวงกลมล้อมรอบข้อความที่ใกล้เคียงกับความรู้สึกของท่านมากที่สุด

1. โดยภาพรวมท่านคิดว่าสุขภาพของท่าน.....

   1. ดีเยี่ยม 2. ดีมาก 3. ดี 4. ปานกลาง 5. เลว

2. **ท่านคิดว่าสุขภาพโดยรวมของท่านปัจจุบันเปรียบเทียบกับ 1 ปีก่อน**

   1. ปัจจุบันดีกว่ามาก 2. ปัจจุบันดีขึ้นบ้าง 3. เท่า ๆ กัน

   4. ปัจจุบันเลวลงกว่าเดิม 5. ปัจจุบันเลวลงกว่าเดิมมาก

3. หัวข้อต่อไปนี้เป็นกิจกรรมที่ท่านอาจทำประจำวัน ท่านคิดว่าสุขภาพปัจจุบันของท่านมีผลทำให้ท่านทำกิจกรรมดังกล่าวลดลงหรือไม่ และมากน้อยเพียงใด

   3.1 กิจกรรมที่ออกแรงมาก เช่น วิ่ง ยกของหนัก ๆ เล่นกีฬา

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.2 กิจกรรมที่ออกแรงปานกลาง เช่น ขยับเขี่ยนโต๊ะ กวาดถูบ้าน เล่นกอล์ฟ เล่นโบว์ลิ่ง

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.3 ยกถือของเวลาไปตลาดหรือซูปเปอร์มาร์เก็ต

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.4 ขึ้นบันไดมากกว่า 1 ชั้น (ขึ้น 1ไปชั้น 3 หรือมากกว่า)

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.5 ขึ้นบันได 1 ชั้น

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.6 ก้มลงเก็บของ คุกเข่า ย่อตัว

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.7 เดินมากกว่า 1 กิโลเมตร

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.8 เดินมากกว่า 100 เมตร

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.9 เดินประมาณ 100 เมตร

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

   3.10 อาบน้ำหรือแต่งตัว

   1. ไม่ลดลงเลย 2. ลดลงบ้าง 3. ลดลงมาก

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ผู้เข้าร่วมวิจัยหมายเลข .....

4. ในช่วง 4 สัปดาห์ที่ผ่านมา ท่านประสบปัญหาเกี่ยวกับการทำงานหรือกิจวัตรประจำวัน ซึ่งเป็นผลเนื่องมาจากสุขภาพของท่าน

4.1 ต้องลดปริมาณเวลาการทำงานหรือกิจวัตรประจำวัน

1. ไม่ใช่ 2. ใช่

4.2 ทำงานได้น้อยกว่าที่ควรเป็น

1. ไม่ใช่ 2. ใช่

4.3 ทำงานหรือกิจวัตรประจำวันบางอย่างไม่ได้

1. ไม่ใช่ 2. ใช่

4.4 ต้องใช้ความพยายามมากขึ้น หรือทำงานได้ลำบากขึ้นกว่าเดิม

1. ไม่ใช่ 2. ใช่

5. ในช่วง 4 สัปดาห์ที่ผ่านมา ท่านประสบปัญหาเกี่ยวกับการทำงานหรือกิจวัตรประจำวัน ซึ่งเป็นผลเนื่องมาจากปัญหาเกี่ยวกับอารมณ์และจิตใจของท่าน เช่น รู้สึกซึมเศร้า หรือวิตกกังวล

5.1 ต้องลดปริมาณเวลาการทำงานหรือกิจวัตรประจำวัน

1. ไม่ใช่ 2. ใช่

5.2 ทำงานได้น้อยกว่าที่ควรเป็น

1. ไม่ใช่ 2. ใช่

5.3 ทำงานหรือกิจวัตรประจำวันบางอย่างไม่ได้

1. ไม่ใช่ 2. ใช่

5.4 ต้องใช้ความพยายามมากขึ้น หรือทำงานได้ลำบากขึ้นกว่าเดิม

1. ไม่ใช่ 2. ใช่

6. ในช่วง 4 สัปดาห์ที่ผ่านมา ปัญหาสุขภาพร่างกายและจิตใจของท่าน มีผลรบกวนต่อกิจกรรมทางสังคมของท่านกับครอบครัว เพื่อน เพื่อนบ้าน หรือกลุ่มทำงาน มากน้อยเพียงใด

1. ไม่รบกวนเลย 2. รบกวนเล็กน้อย 3. รบกวนปานกลาง
4. รบกวนมาก 5. รบกวนมากๆ

7. ในช่วง 4 สัปดาห์ที่ผ่านมา ท่านมีอาการเจ็บหรือปวด ตามส่วนต่างๆ ของร่างกาย มากน้อยเพียงใด

1. ไม่มี 2. มีน้อยมาก 3. มีน้อย
4. มีปานกลาง 5. มีรุนแรง 6. มีรุนแรงมาก

ผู้เข้าร่วมวิจัยหมายเลข .....

8. ในช่วง 4 สัปดาห์ที่ผ่านมา อาการเจ็บหรือปวดมีมากรบกวนต่อการทำงานปกติของท่าน มากน้อยเพียงใด

1. ไม่รบกวนเลย 2. รบกวนเล็กน้อย 3. รบกวนปานกลาง
4. รบกวนมาก 5. รบกวนมากๆ

9. คำถามต่อไปนี้ เกี่ยวข้องถึงความรู้สึกหรือความเป็นไปของสิ่งรอบตัวท่าน ในช่วง 4 สัปดาห์ที่ผ่านมา กรุณาให้คำตอบที่ใกล้เคียงกับความรู้สึกมากที่สุด ในช่วง 4 สัปดาห์นี้

9.1 รู้สึกกระปรี้กระเปร่า

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.2 เต็มไปด้วยความวิตกกังวล

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.3 รู้สึกซึมเศร้าหรือหดหู่มากจนไม่รู้สึกร่าเริงเลย

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.4 รู้สึกสงบ

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.5 รู้สึกเต็มไปด้วยพลังงาน

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.6 รู้สึกเสียกำลังใจ หรือซึมเศร้า

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.7 รู้สึกเหนื่อยเพลีย หมดกำลัง

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.8 รู้สึกมีความสุขดี

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

9.9 รู้สึกเบื่อหน่าย

1. ตลอดเวลา 2. เกือบตลอดเวลา 3. เวลาส่วนใหญ่
4. บางเวลา 5. เวลาส่วนน้อย 6. ไม่มีเวลาใดเลย

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ผู้เข้าร่วมวิจัยหมายเลข .....

10. ในช่วง 4 สัปดาห์ที่ผ่านมา ปัญหาสุขภาพหรืออารมณ์ของท่าน มีผลรบกวนต่อเวลาที่บ้าน กิจกรรมทางสังคม เช่นไปเยี่ยมเพื่อน หรือ ญาติ

1. ตลอดเวลา 2. เวลาส่วนใหญ่ 3. บางเวลา
4. เวลาส่วนน้อย 5. ไม่เลย

11. ข้อความต่อไปนี้ ข้อความใดที่ตรงกับลักษณะของท่าน

11.1 ไม่สบายง่ายกว่าคนทั่วไป

1. ถูกต้องตรงความจริง 2. ถูกต้องส่วนใหญ่ 3. ไม่ทราบ
4. ส่วนใหญ่ไม่ถูกต้อง 5. ไม่ถูกต้อง

11.2 มีสุขภาพดีเท่าๆคนอื่น

1. ถูกต้องตรงความจริง 2. ถูกต้องส่วนใหญ่ 3. ไม่ทราบ
4. ส่วนใหญ่ไม่ถูกต้อง 5. ไม่ถูกต้อง

11.3 ท่านคาดว่าสุขภาพจะเลวลง

1. ถูกต้องตรงความจริง 2. ถูกต้องส่วนใหญ่ 3. ไม่ทราบ
4. ส่วนใหญ่ไม่ถูกต้อง 5. ไม่ถูกต้อง

11.4 สุขภาพของท่านดีเยี่ยม

1. ถูกต้องตรงความจริง 2. ถูกต้องส่วนใหญ่ 3. ไม่ทราบ
4. ส่วนใหญ่ไม่ถูกต้อง 5. ไม่ถูกต้อง

โปรดตอบคำถามในหน้าต่อไป ขอบคุณ

ผู้เข้าร่วมวิจัยหมายเลข.....

ต่อไปนี้ขอรู้จักท่านบ้างนะคะ
กรุณาตอบคำถามต่อไปนี้ให้สมบูรณ์ที่สุดเท่าที่ท่านจะสามารถทำได้

1. ท่านอายุเท่าไร.....ปี
   เกิดเดือน.....ปี พ.ศ.....
2. **เพศ** ☐ **ชาย** ☐ **หญิง**
3. วุฒิสูงสุดทางการศึกษา
   - ☐ ไม่ได้ผ่านการศึกษาในระบบโรงเรียน
   - ☐ ประถมศึกษา ☐ มัธยมศึกษา
   - ☐ โรงเรียนฝึกอาชีพ ☐ อาชีวศึกษา
   - ☐ วิทยาลัย ☐ ปริญญาตรี
   - ☐ สูงกว่าปริญญาตรี
   - ☐ อื่นๆ .....
4. **สถานภาพทางการสมรส**
   - ☐ **โสด** ☐ **หม้าย**
   - ☐ **สมรส/อยู่ด้วยกัน**
   - ☐ **หย่าร้าง/แยกกันอยู่**
   - ☐ **อื่น ๆ** .....
5. ท่านอาศัยอยู่กับ
   - ☐ อยู่ลำพัง ☐ คู่สมรส
   - ☐ ลูก ๆ ☐ เพื่อนๆ
   - ☐ ญาติ พี่น้อง ☐ คู่สมรสและลูก
   - ☐ คู่สมรสและญาติ ๆ
   - ☐ อื่น ๆ.....
6. **อาชีพในปัจจุบัน**
   - ☐ **เกษียณ/ว่างงาน** ☐ **ทำงาน**
   - ☐ **อื่น ๆ**.....
7. ท่านมีส่วนสูงเท่าไร.....เซนติเมตร
8. **ท่านมีน้ำหนักเท่าไร**.....กิโลกรัม
9. ข้อใดที่อธิบายถึงรายได้ของท่านได้อย่างดีที่สุด
   - ☐ ไม่เพียงพอ
   - ☐ เพียงพอแต่ไม่มีเก็บออม
   - ☐ เหลือเงินที่จะสะสมบ้าง
   - ☐ มีเงินเหลือเก็บ
10. **ปัจจุบันนี้ท่านสูบบุหรี่หรือไม่**
    ☐ **สูบ** ☐ **ไม่สูบ**
11. ภายในเวลา 6 เดือนที่ผ่านมาท่านได้เลิกสูบบุหรี่แล้วหรือไม่
    ☐ ใช่ ☐ ไม่ใช่
12. **ท่านรับประทานอาหารไขมันต่ำหรือไม่**
    ☐ **ใช่** ☐ **ใช่ ในบางโอกาส**
    ☐ **ไม่เคยสนใจรับประทานเลย**
13. ข้อมูลต่อไปนี้ข้อใดที่แสดงลักษณะของอาชีพปัจจุบันหรืออาชีพเดิมของท่านได้ดีที่สุด
    - ☐ ส่วนใหญ่นั่งทำงานโดยที่มีการเคลื่อนไหวของแขนเล็กน้อยเช่น พนักงานออฟฟิศ พนักงานธนาคาร พ่อค้าแม่ค้าในตลาด คนงานโรงงานที่นั่ง ทำงานในสายการผลิต หรือช่างแชม คนขับรถนั่งหรือรถบรรทุก
    - ☐ นั่งหรือยืนและเดินบ้างเช่น พนักงาน เก็บเงิน ครู พยาบาล แพทย์ บาร์เทนเดอร์ คนตัดหญ้า พนักงานทั่วไปในออฟฟิศ คนขับรถยกของในห้าง คนบังคับเครนยกวัสดุก่อสร้าง คนงานทำงานกับเครื่องจักรเบา ๆ
    - ☐ เดินและทำงานโดยใช้มือยกของที่หนักน้อยกว่า 20 กิโลกรัม (เช่น บุรุษ ไปรษณีย์ พนักงานเสิร์ฟ คนงานก่อสร้าง พนักงานเครื่องจักรกลหนัก
    - ☐ เดินและทำงานโดยใช้มือยกของที่หนักมากกว่า 20 ก.ก. เช่นคนตัดไม้ ชาวไร่ชาวนา กับช่างทั่วไป

De-1

ผู้เข้าร่วมวิจัยหมายเลข .....

สุขภาพของท่าน

ต่อไปนี้เป็นโรคหรือภาวะทางการแพทย์ที่ท่าน อาจเคยเป็น มาก่อน หมอเคยบอกว่าท่านเป็น...

โรคหรือภาวะทางการแพทย์	มี	ไม่มี	โรคหรือภาวะทางการแพทย์	มี	ไม่มี
1. โรคไขข้ออักเสบ			9. หัวใจล้มเหลว		
2. โรคหอบหืด			10. ความดันโลหิตสูง		
3. โรคหลอดลมอักเสบเรื้อรังหรือถุงลมโป่งพอง			11. หัวใจเต้นผิดปกติ		
			12. โรคหลอดเลือดเลี้ยงหัวใจตีบ		
4. โรคซึมเศร้า			13. โรคหลอดเลือดเลี้ยงสมอง		
5. โรคเบาหวาน			14. โรคมะเร็ง		
6. โรคไตเรื้อรัง			15. โรคพิษสุราเรื้อรัง		
7. โรคต่อมไทรอยด์เป็นพิษ			16. โรคเกี่ยวกับระบบทางเดินอาหาร		
8. โรคต่อมไทรอยด์ทำงานน้อยผิดปกติ			17. อื่นๆ.....		

ท่านได้ตอบแบบสอบถามครบถ้วนแล้วค่ะ
ขอขอบพระคุณอย่างสูงในความร่วมมือที่ท่านมอบให้
โปรดคืนแบบสอบถามที่ผู้วิจัยค่ะ

EXERCISE INVENTORY

FOR

MIDDLE-AGED AND OLDER ADULTS

WITH

CORONARY ARTERY DISEASE

ENGLISH VERSION

It's not as long as it looks!

See note on the next page.

This will take a
bit of effort,
but .....it's worth it!

Instruction

1. The pages of questions that follow will probably look very long.

You will find, however, that many pages turn quite quickly.

2. Questions often list many possible answers, and usually only one of these will apply to you.

Give the most likely answer to every question, even if you are not absolutely sure.

3. It will be useful if you answer every question, unless the instructions specifically direct you to skip it. But you have right to refuse to answer any question.

Subject No.....

Stages of Change for Exercise

The following 5 statements will assess how much you currently exercise in your leisure time (exercise done outside of a job).

Exercise is any planned physical activity performed to increase physical fitness (e.g. brisk walking, jogging, bicycling, swimming, dancing, or any other physical activity where exertion is similar to this).

Regular exercise means accumulating 30 minutes or more of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat.

For example, in one day you could take one 30-minute brisk walk or three 10-minute brisk walks. If you do at least this amount of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat, then you are doing regular exercise.

Do you EXERCISE REGULARLY (accumulating 30 minutes or more of exercise most days of the week) according to the definition above?

Please mark only ONE of the five statements.

- ☐ 1. No, and I do NOT INTEND to begin exercising regularly in the next 6 months.
- ☐ 2. No, but I intend to begin exercising regularly in the next 6 months.
- ☐ 3. No, but I intend to begin exercising regularly in the next 30 days.
- ☐ 4. Yes, I have been, but for LESS than 6 months.
- ☐ 5. Yes, I have been for MORE than 6 months.

Please go to the next page, thank you.

Subject No.....

Processes of Change for Exercise

The following experiences can affect the exercise habits of some people. Think of similar experiences you may be currently having or have had **during the past month.** Then rate how frequently the event occurs by circling the appropriate number. Please answer using the following 5-point scale:

0 Never **1** Seldom **2** Occasionally **3** Often **4** Repeatedly

Have you had think of similar experiences during the past month?	Never	Seldom	Occasionally	Often	Repeatedly
1. I read articles about exercise in an attempt to learn more about it.	**0**	**1**	**2**	**3**	**4**
2. I look for information related to exercise.	0	1	2	3	4
3. I find out about new methods of exercising.	**0**	**1**	**2**	**3**	**4**
4. I talk to my physician about exercise.	0	1	2	3	4
5. I get upset when I see people who would benefit from exercise but choose not to exercise.	**0**	**1**	**2**	**3**	**4**
6. I am afraid of the consequences to my health if I do not exercise.	0	1	2	3	4
7. I get upset when I realize that people I love would have better health if they exercised.	**0**	**1**	**2**	**3**	**4**
8. I worry that I may have a heart attack like others who were inactive.	0	1	2	3	4
9. I realize that if I do not exercise regularly, I may get ill and be a burden to others.	**0**	**1**	**2**	**3**	**4**
10. I think that my exercising regularly will prevent me from being a burden to the healthcare system.	0	1	2	3	4
11. I think that regular exercise plays a role in reducing health care costs.	**0**	**1**	**2**	**3**	**4**

Subject No.....

Processes of Change for Exercise

Have you had think of similar experiences during the past month?	Never	Seldom	Occasionally	Often	Repeatedly
12. **I realize that if I exercise regularly, I will be a good role model to my children.**	0	1	2	3	4
13. I feel more confident when I exercise regularly.	0	1	2	3	4
14. **I believe that regular exercise will make me a healthier, happier person.**	0	1	2	3	4
15. I feel better about myself when I exercise.	0	1	2	3	4
16. **I feel that I am taking care of my health when I exercise regularly.**	0	1	2	3	4
17. I have noticed that many people know that exercise is good for them.	0	1	2	3	4
18. **I am aware of more and more people who are making exercise a part of their lives.**	0	1	2	3	4
19. I have noticed that famous people often advertise the fact that they exercise regularly.	0	1	2	3	4
20. **I am aware of an increase in exercise activity at a senior center in my community.**	0	1	2	3	4
21. When I feel tired, I make myself exercise anyway because I know I will feel better afterwards.	0	1	2	3	4
22. **Instead of taking a nap after work, I exercise.**	0	1	2	3	4
23. Instead of relaxing by watching TV or eating, I take a walk or exercise.	0	1	2	3	4
24. **When I feel blue or sad, I make myself exercise.**	0	1	2	3	4

Subject No.....

Processes of Change for Exercise

Have you had think of similar experiences during the past month?	Never	Seldom	Occasionally	Often	Repeatedly
25. I have a friend who encourages me to exercise when I do not feel up to it.	**0**	**1**	**2**	**3**	**4**
26. My friends encourage me to exercise.	0	1	2	3	4
27. I have someone who encourages me to exercise.	**0**	**1**	**2**	**3**	**4**
28. I have someone to exercise with.	0	1	2	3	4
29. One of the rewards of regular exercise is that it improves my mood.	**0**	**1**	**2**	**3**	**4**
30. I try to think of exercise as a time to clear my mind as well as a workout for my body.	0	1	2	3	4
31. If I engage in regular exercise, I find that I get the benefit of having more energy.	**0**	**1**	**2**	**3**	**4**
32. I like the social interaction when I exercise.	0	1	2	3	4
33. I tell myself that I can keep exercising if I try hard enough.	**0**	**1**	**2**	**3**	**4**
34. I make commitments to exercise.	0	1	2	3	4
35. I believe that I can exercise regularly.	**0**	**1**	**2**	**3**	**4**
36. I have told others that I have a commitment to exercise.	0	1	2	3	4
37. I keep a set of exercise clothes conveniently located so I can exercise whenever I get the time.	**0**	**1**	**2**	**3**	**4**
38. I use my calendar to schedule my exercise time.	0	1	2	3	4
39. I make sure I always have a clean set of exercise clothes.	**0**	**1**	**2**	**3**	**4**
40. I put things around my home to remind me to exercise.	0	1	2	3	4

Subject No.....

Decisional Balance for Exercise

This section looks at positive and negative aspects of exercise. Read the following items and indicate how important each statement is with respect to your decision to exercise or not to exercise in your leisure time by filling in the appropriate circle. Please answer using the following 4-point scale:

0	1	2	3	4
Not at all Important	**Somewhat Important**	**Moderately Important**	**Very Important**	**Completely Important**

If you disagree with a statement and are unsure how to answer, the statement is probably not important to you.

How important are the following opinions in your decision to exercise or not to exercise?	**Not at all**	**Somewhat**	**Moderately**	**Very**	**Completely**
1. I would have more energy for my family and friends if I exercised regularly.	0	1	2	3	4
2. I would feel embarrassed if people saw me exercising.	**0**	**1**	**2**	**3**	**4**
3. I would feel less stressed if I exercised regularly.	0	1	2	3	4
4. Exercise prevents me from spending time with my friends.	**0**	**1**	**2**	**3**	**4**
5. Exercising puts me in a better mood for the rest of the day.	0	1	2	3	4
6. I feel uncomfortable or embarrassed in exercise clothes.	**0**	**1**	**2**	**3**	**4**
7. I would feel more comfortable with my body if I exercised regularly.	0	1	2	3	4
8. There is too much I would have to learn to exercise.	**0**	**1**	**2**	**3**	**4**
9. Regular exercise would help me have a more positive outlook on life.	0	1	2	3	4
10. Exercise puts an extra burden on my significant other.	**0**	**1**	**2**	**3**	**4**

Subject No.....

Decisional Balance for Exercise

How important are the following opinions in your decision to exercise or not to exercise?	**Not at all**	**Somewhat**	**Moderately**	**Very**	**Completely**
11. I would have stronger bone and muscles if I exercised regularly.	0	1	2	3	4
12. I am too shy to exercise with other people.	0	1	2	3	4
13. My heart would work better if I exercised regularly.	0	1	2	3	4
14. I would get pain or discomfort from exercise.	0	1	2	3	4
15. Exercise gives me companionship with others.	0	1	2	3	4
16. My health concerns prevent me from exercise.	0	1	2	3	4

Your information is valuable, thank you for your concentration.

Please go to the next page.⇨⇨⇨

Subject No.....

Social Influences on Exercise

Think of similar experiences you may be currently having or have had **during the past year**. Then rate how frequently the event occurs by circling the appropriate number. Please answer using the following 5- point scale:

0 Never **1 Seldom** **2 Occasionally** **3 Often** **4 Repeatedly**

During the past 12 months, how often have your family and friends	**Never**	**Seldom**	**Occasionally**	**Often**	**Repeatedly**
1. Made plans with you for doing an exercise together?	0	1	2	3	4
2. Teamed up with you to engage in an exercise together?	**0**	**1**	**2**	**3**	**4**
3. Promised you that they would participate in an exercise with you?	0	1	2	3	4
4. Given you helpful reminders to do an exercise together with them?	**0**	**1**	**2**	**3**	**4**
5. Changed their schedules so you can do an exercise together?	0	1	2	3	4
6. Informed you about the expected positive effect of an exercise on your health?	**0**	**1**	**2**	**3**	**4**
7. Explained to you why an exercise is important to change your health?	0	1	2	3	4
8. Clarified for you how you may achieve your health goals through an exercise?	**0**	**1**	**2**	**3**	**4**
9. Suggested an exercise program or facility, which might assist your health?	0	1	2	3	4
10. Explained to you about the amount or intensity of an exercise necessary for improving your health?	**0**	**1**	**2**	**3**	**4**
11. Complimented you on the mastery of an exercise skill?	0	1	2	3	4

Subject No.....

Social Influences on Exercise

During the past 12 months, how often have your family and friends	Never	Seldom	Occasionally	Often	Repeatedly
12. Praised you that your exercise level is superior to that of other people at your age?	**0**	**1**	**2**	**3**	**4**
13. Affirmed that you have done well in your exercise?	0	1	2	3	4
14. Shown their respect for your versatility in an exercise?	**0**	**1**	**2**	**3**	**4**
15. Told you that you should be proud of your exercise skills?	0	1	2	3	4
16. Warned you that starting an exercise would worsen your health?	**0**	**1**	**2**	**3**	**4**
17. Advised you to avoid an exercise in order to avoid injury or ill health?	0	1	2	3	4
18. Told you that you should keep away from an exercise in order not to have falls or accidents?	**0**	**1**	**2**	**3**	**4**
19. Forbidden you to engage in an exercise because of the potential health risk?	0	1	2	3	4
20. Told you that more exercise is not necessary for you because you are very busy in your other daily routines?	**0**	**1**	**2**	**3**	**4**
21. Told you that you do not need to do more exercise because you are healthy enough?	0	1	2	3	4
22. Told you that you do not need to do more exercise because you know how to care for your health?	**0**	**1**	**2**	**3**	**4**
23. Told you that more exercise is not necessary for you because it is not appropriate for your age?	0	1	2	3	4

Subject No.....

Social Influences on Exercise

During the past 12 months, how often have your family and friends	Never	Seldom	Occasionally	Often	Repeatedly
24. Excluded you because of your low ability in an exercise?	**0**	**1**	**2**	**3**	**4**
25. Forced you to do an exercise which you disliked?	0	1	2	3	4
26. Complained that your skill in an exercise is not good enough?	**0**	**1**	**2**	**3**	**4**
27. Criticized your low skill level in an exercise?	0	1	2	3	4

Subject No.....

Self-efficacy for Overcoming Barriers to Exercise

This part looks at how confident you are to exercise when other things get in the way. Read the following items and circle the number that best expresses how each item relates to you in your leisure time. Please answer using the following 4-point scale:

0	1	2	3	4
Not at all Confident	**Somewhat Confident**	**Moderately Confident**	**Very Confident**	**Completely Confident**

I am confident I can participate in regular exercise when:	Not at all	Somewhat	Moderately	Very	Completely
1. I am under a lot of stress.	0	1	2	3	4
2. I am depressed.	**0**	**1**	**2**	**3**	**4**
3. I am anxious.	0	1	2	3	4
4. I feel too old.	**0**	**1**	**2**	**3**	**4**
5. I feel I do not have the time.	0	1	2	3	4
6. I do not feel like it.	**0**	**1**	**2**	**3**	**4**
7. I am busy.	0	1	2	3	4
8. I feel physical discomfort when I exercise.	**0**	**1**	**2**	**3**	**4**
9. I am experiencing personal or family problems.	0	1	2	3	4
10. I am alone.	**0**	**1**	**2**	**3**	**4**
11. I have to exercise alone.	0	1	2	3	4
12. My exercise partner decides not to exercise that day.	**0**	**1**	**2**	**3**	**4**
13. I do not have access to exercise equipment.	0	1	2	3	4
14. I am away from home often.	**0**	**1**	**2**	**3**	**4**
15. Transportation is not convenient.	0	1	2	3	4
16. The environment is not safe for walking.	**0**	**1**	**2**	**3**	**4**
17. My friends do not want me to exercise.	0	1	2	3	4
18. My family does not want me to exercise.	**0**	**1**	**2**	**3**	**4**

Subject No.....

Self-efficacy for Overcoming Barriers to Exercise

I am confident I can participate in regular exercise when:	**Not at all**	**Somewhat**	**Moderately**	**Very**	**Completely**
19. I am spending time with friends or family who do not exercise.	0	1	2	3	4
20. It is raining.	**0**	**1**	**2**	**3**	**4**
21. It is too hot.	0	1	2	3	4
22. There is air pollution.	**0**	**1**	**2**	**3**	**4**
23. The roads or sidewalks are slippery.	0	1	2	3	4

Subject No.....

Physical Activity

This questionnaire is about activities that you may have done in the past 4 weeks. The questions on the following pages are similar to the example shown below.

INSTRUCTIONS

If you DID the activity in the past 4 weeks:

Step #1 **Check the YES box.**

Step #2 **Circle how many TOTAL HOURS in a typical week you did the activity. Please estimate your total hours nearly half an hour.**

If you DID NOT do the activity in the past 4 weeks:

*** Check the NO box and move to the next question.**

Here is an example of how Mrs. Niramon would answer question #1:

Mrs. Suthep usually visits her friends Niramon and Sompong twice a week. She usually spends one hour on Monday with Suthep and two hours on Wednesday with Sompong. Therefore, the total hours a week that she visits with friends is 3 hours a week.

In a typical week during the past 4 weeks, did you...							
1. Visit with friends or family (other than those you live with)?							
☑ Yes → How many TOTAL Hours a week did you usually do it? →	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
☐ No → Go to the next question							

Physical Activity

In a typical week during the past 4 weeks, did you...

1. Visit with friends or family (other than those you live with)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
2. Go to the senior center? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
3. Do volunteer work? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
4. Take part in church activities (such as cleaning temple field)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
5. Attend other club or group meetings? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
6. Use a computer? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
7. Dance (such as square, folk, line, ballroom) (do not count aerobic dance)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours

Physical Activity

In a typical week during the past 4 weeks, did you...

8. Do woodworking, needlework, drawing, or other arts, or crafts? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
9. Play golf, carrying or pulling your equipment (count walking time only)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
10. Play golf, riding a cart (count walking time only)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
11. Attend a concert, movie, lecture, or sport event? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
12. Play cards, bingo, or board games with other people or children? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
13. Shoot pool or billiards? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours

Physical Activity

In a typical week during the past 4 weeks, did you...

	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
14.Play singles tennis (do not count doubles)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
15.Play doubles tennis (do not count singles)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
16.Play a musical instrument? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
17.Read? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
18.Do heavy work around the house (such as washing windows, cleaning gutters, or scrubbing floors inside your home)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						

Physical Activity

In a typical week during the past 4 weeks, did you...						
19.Do light work around the house (such as sweeping, or feeding pets)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
20.Do heavy gardening (such as heavy lifting, digging, spading, raking)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
21.Do light gardening (such as watering plants)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
22.Work on your car, truck, lawn mower, or other machinery? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
23.Jog or run? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours

Physical Activity

In a typical week during the past 4 weeks, did you...

	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
24. Walk fast or briskly for exercise (do not count walking leisurely or uphill)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
25. Walk to do errands (such as to/from a store or to take children to school (count walk time only)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
26. Walk leisurely for exercise or pleasure (such as walking meditation)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
27. Ride a bicycle or stationary cycle? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
28. Do other aerobic machines such as rowing, or step machines (do not count treadmill or stationary cycle)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
29. Do water exercises (do not count other swimming)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						

Physical Activity

In a typical week during the past 4 weeks, did you...	Less Than 1 hour	1-2.5 hours	3-4.5 hours	5-6.5 hours	7-8.5 hours	9 or more hours
30.Swim gently? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
31.Do stretching or flexibility exercises (do not count yoga or Tai-Chi)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
32. Do yoga or Tai-Chi? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
33.Do aerobics or aerobic dancing? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
34.Do moderate to heavy strength training (such as hand-held weights of more than 2.5 Kgs., weight machines, or push-ups)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						
35.Do light strength training (such as hand-held weights of 2.5 Kgs. or less or elastic bands)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No → Go to the next question						

Physical Activity

In a typical week during the past 4 weeks, did you...

36.Do general conditioning exercises, such as light calisthenics or chair exercises (do not count strength training)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No→ Go to the next question	Less Than 1 hour · 1-2.5 hours · 3-4.5 hours · 5-6.5 hours · 7-8.5 hours · 9 or more hours
37.Play basketball, soccer, or racquetball (do not count time on sidelines)? ☐ Yes → How many TOTAL Hours a week did you usually do it? → ☐ No→ Go to the next question	Less Than 1 hour · 1-2.5 hours · 3-4.5 hours · 5-6.5 hours · 7-8.5 hours · 9 or more hours
38.Do other types of physical activity not previously mentioned (please specify type and total hours per week)?	
.....	
.....	
.....	
.....	
.....	
39.How many days per week did you usually exercise accumulating at least 30 minutes at a level that caused you to increase your breathing rate and break a sweat?	.....days/week

Subject No.....

Now I would like to know about you.

Please answer the following questions as best as you can:

1. How old are you?

   .....years

   When were you born?

   Month..... Year .....

2. Gender

   ☐ 1. Male ☐ 2. Female

3. What is the highest level of regular school you completed?

   ☐ 1. None
   ☐ 2. Elementary
   ☐ 3. High school
   ☐ 4. Vocational training
   ☐ 5. College
   ☐ 6. Bachelor degree
   ☐ 7. Higher than Bachelor degree
   ☐ 8. Other .....

4. What is your current marital status?

   ☐ 1. Single
   ☐ 2. Married/Cohibitant
   ☐ 3. Divorced/Separated
   ☐ 4. Widowed
   ☐ 5. Other .....

5. With whom are you living?

   ☐ 1. Alone ☐ 2. Spouse
   ☐ 3. Children ☐ 4. Friends
   ☐ 5. Other relatives
   ☐ 6. Spouse and children
   ☐ 7. Spouse and other relatives
   ☐ 8. Other.....

6. How tall are you?.....cms.
7. What is your weight?.....Kgs.
8. Are you currently employed?

   ☐ 1. Employed
   ☐ 2. Retired or unemployed
   ☐ 3. Others.....

9. Which of the following categories best describes characteristics of your occupation or former occupation?

   ☐ 1. Mainly sitting with slight arm movements (examples: office worker, banker, monger in a market place, seated assembly or repair line worker, driving car or truck, etc.).

   ☐ 2. Sitting or standing with some walking (examples: cashier, teacher, nurses, doctors, bartender, general office worker, riding mower or forklift, crane operation, light machinery worker, etc.).

   ☐ 3. Walking, with some handling of materials generally weighing less than 20 Kgs. (examples: mailman, waiter/ waitress, construction worker, heavy tool and machinery worker, etc.).

   ☐ 4. Walking and heavy manual work often requiring handling of materials weighing over 20 kgs. (examples: lumberjack, stone mason, farmer, or general laborer.)

10. Which of the following categories best describes your income?

    ☐ 1. Not enough
    ☐ 2. Enough but no saving
    ☐ 3. Having some extra money to save
    ☐ 4. I have more than I need.

Please go to the next page, thank you. ⇨⇨⇨

Subject No.....

Please tell me more about your medical conditions

There are a list of medical conditions that you may have. Has a physician ever told you that you have .....

1. Arthritis?
   ☐ Yes ☐ No
2. Asthma?
   ☐ Yes ☐ No
3. Chronic bronchitis or emphysema?
   ☐ Yes ☐ No
4. Depression?
   ☐ Yes ☐ No
5. Diabetes mellitus?
   ☐ Yes ☐ No
6. Chronic renal disease?
   ☐ Yes ☐ No
7. Hyperthyroidism?
   ☐ Yes ☐ No
8. Hypothyroidism?
   ☐ Yes ☐ No
9. Heart failure?
   ☐ Yes ☐ No
10. High blood pressure?
    ☐ Yes ☐ No
11. Irregular heart beat?
    ☐ Yes ☐ No
12. Coronary heart disease?
    ☐ Yes ☐ No
13. Stroke?
    ☐ Yes ☐ No
14. Cancer?
    ☐ Yes ☐ No
15. Alcoholism?
    ☐ Yes ☐ No
16. Gastrointestinal disease?
    ☐ Yes ☐ No
17. Others?

_____

_____

_____

Health Behaviors

18. Have you quit smoking cigarettes within the past 6 months?
    ☐ Yes ☐ No
19. Do you smoke cigarettes now?
    ☐ Yes ☐ No
20. Do you now eat a low-fat diet?
    ☐ Yes, I do.
    ☐ Yes, sometimes.
    ☐ No, I do not.

Subject No.....

Now I would like to know about you.

Please answer the following questions as best as you can:

1. How old are you?

   .....years

   When were you born?

   Month..... Year .....

2. Gender

   ☐ 1. Male ☐ 2. Female

3. What is the highest level of regular school you completed?

   ☐ 1. None
   ☐ 2. Elementary
   ☐ 3. High school
   ☐ 4. Vocational training
   ☐ 5. College
   ☐ 6. Bachelor degree
   ☐ 7. Higher than Bachelor degree
   ☐ 8. Other .....

4. What is your current marital status?

   ☐ 1. Single
   ☐ 2. Married/Cohibitant
   ☐ 3. Divorced/Separated
   ☐ 4. Widowed
   ☐ 5. Other .....

5. With whom are you living?

   ☐ 1. Alone ☐ 2. Spouse
   ☐ 3. Children ☐ 4. Friends
   ☐ 5. Other relatives
   ☐ 6. Spouse and children
   ☐ 7. Spouse and other relatives
   ☐ 8. Other.....

6. How tall are you?.....cms.
7. What is your weight?.....Kgs.
8. Are you currently employed?

   ☐ 1. Employed
   ☐ 2. Retired or unemployed
   ☐ 3. Others.....

9. Which of the following categories best describes characteristics of your occupation or former occupation?

   ☐ 1. Mainly sitting with slight arm movements (examples: office worker, banker, monger in a market place, seated assembly or repair line worker, driving car or truck, etc.).

   ☐ 2. Sitting or standing with some walking (examples: cashier, teacher, nurses, doctors, bartender, general office worker, riding mower or forklift, crane operation, light machinery worker, etc.).

   ☐ 3. Walking, with some handling of materials generally weighing less than 20 Kgs. (examples: mailman, waiter/ waitress, construction worker, heavy tool and machinery worker, etc.).

   ☐ 4. Walking and heavy manual work often requiring handling of materials weighing over 20 kgs. (examples: lumberjack, stone mason, farmer, or general laborer.)

10. Which of the following categories best describes your income?

    ☐ 1. Not enough
    ☐ 2. Enough but no saving
    ☐ 3. Having some extra money to save
    ☐ 4. I have more than I need.

Subject No.....

Please tell me more about your medical conditions

There are a list of medical conditions that you may have. Has a physician ever told you that you have .....

1. Arthritis?
   ☐ Yes ☐ No
2. Asthma?
   ☐ Yes ☐ No
3. Chronic bronchitis or emphysema?
   ☐ Yes ☐ No
4. Depression?
   ☐ Yes ☐ No
5. Diabetes mellitus?
   ☐ Yes ☐ No
6. Chronic renal disease?
   ☐ Yes ☐ No
7. Hyperthyroidism?
   ☐ Yes ☐ No
8. Hypothyroidism?
   ☐ Yes ☐ No
9. Heart failure?
   ☐ Yes ☐ No
10. High blood pressure?
    ☐ Yes ☐ No
11. Irregular heart beat?
    ☐ Yes ☐ No
12. Coronary heart disease?
    ☐ Yes ☐ No
13. Stroke?
    ☐ Yes ☐ No
14. Cancer?
    ☐ Yes ☐ No
15. Alcoholism?
    ☐ Yes ☐ No
16. Gastrointestinal disease?
    ☐ Yes ☐ No
17. Others?

    _____

    _____

    _____

Health Behaviors

18. Have you quit smoking cigarettes within the past 6 months?
    ☐ Yes ☐ No
19. Do you smoke cigarettes now?
    ☐ Yes ☐ No
20. Do you now eat a low-fat diet?
    ☐ Yes, I do.
    ☐ Yes, sometimes.
    ☐ No, I do not.

Thank you very much for your time and information.

Please return the questionnaire to the researcher.

THANK YOU VERY MUCH.

APPENDIX C

RATING SHEET FOR CONTENT VALIDITY

CONTENT VALIDITY

INSTRUCTIONS

The purpose of these questionnaires is to measure factors related to exercise in middle-aged and older adults with coronary artery disease. Since you have experience with exercise or with this population, you are asked to look at the questionnaire items and tell if they seem to measure various aspects of factors related to exercise.

You will be given items from six questionnaires to rate. Attached sheets are response sheets with their definitions. For each definition and set of items, four questions will be asked about each item. The four questions are:

1. Does it belong to the definition? You will answer Yes or No next to each item number on the response sheet under question A.
2. Is each item unique? Answer Yes or No under question B.
3. Is each item clear? Answer Yes or No under question C.
4. Write any comments in the space provided beside each item, such as missing items from the list that you think should be there or rewording of items that you think are not clear.

Thank you very much for your help.

RESPONSE SHEET: CONTENT VALIDITY

DATE: _____VALIDATOR NAME: _____

DECISIONAL BALANCE FOR EXERCISE

The decisional balance is the individual's decision process of rating costs of exercise behavior relative to benefits of exercise behavior. The scale has two factors-the benefits of exercise (Pros) and the costs of engaging in the exercise behavior (Cons).

Definition: Pro means individual's perception of benefits of exercise.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันรู้สึกกระชุ่มกระช่วยมีกำลังวังชามากขึ้น สำหรับครอบครัวและเพื่อนๆ ถ้าฉัน ออกกำลังกายอย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกเครียดน้อยลงถ้าฉันออกกำลังกายสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันมีอารมณ์ดีขึ้นทั้งวันภายหลังการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกสบายตัวขึ้น ถ้าฉันออกกำลังกายอย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
การออกกำลังกายอย่างสม่ำเสมอจะช่วยให้ฉันมีมุมมองต่อชีวิตดีขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Pro means individual's perception of benefits of exercise.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
การออกกำลังกายอย่างสม่ำเสมอจะทำให้ฉันมีกระดูกและกล้ามเนื้อที่แข็งแรงขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
หัวใจของฉันจะทำงานดีขึ้นถ้าฉันออกกำลังกายอย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
การออกกำลังกายทำให้ฉันมีมิตรภาพกับผู้อื่น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Cons means individual's perception of costs of engaging in exercise.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันจะรู้สึกอับอายขายหน้า ถ้ามีคนเห็นฉัน ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
การออกกำลังกายจะรบกวนการใช้เวลาของฉันกับครอบครัวและเพื่อนๆ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกอึดอัดหรืออาย เมื่อสวมชุด ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันจะต้องเรียนรู้อีกหลายอย่างเกินไป เพื่อการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
การออกกำลังกายเป็นการเพิ่มภาระต่อ สามี / ภรรยาของฉัน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกอายเกินไปที่จะออกกำลังกายร่วมกับผู้อื่น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันจะรู้สึกเจ็บปวดหรือไม่สบายจากการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ความกังวลเกี่ยวกับสุขภาพทำให้ฉันไม่อยากออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

RESPONSE SHEET: CONTENT VALIDITY

DATE: _____ VALIDATOR NAME: _____

PROCESSES OF CHANGE FOR EXERCISE

Processes of change for exercise are "the various strategies that people use to perform their experiences and environments in order to change behavior." There are ten processes of change for exercise: Consciousness raising, Dramatic relief, Self-reevaluation, Environmental reevaluation, Social liberation, Counterconditioning, Helping relationships, Reinforcement management, Self-liberation, and Stimulus control.

Definition: Consciousness raising means efforts by the individual to seek new information and to gain understanding and feedback about the problem.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันอ่านบทความเกี่ยวกับการออกกำลังกายเพื่อพยายามที่จะเรียนรู้ให้มากขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันหาข้อมูลเกี่ยวกับการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันค้นพบวิธีการใหม่ๆ เกี่ยวกับการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันพูดคุยกับคุณหมอที่ดูแลฉันเกี่ยวกับการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Dramatic relief means affective aspects of change, often involving intense emotional experiences related to the problem behavior

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันรู้สึกอารมณ์เสียเมื่อเห็นคนที่ควรจะได้รับผลดีจากการออกกำลังกายแต่กลับเลือกที่จะไม่ทำ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันกลัวผลเสียที่จะเกิดตามมาต่อสุขภาพ ถ้าฉันไม่ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกอารมณ์เสียเมื่อทราบว่าบุคคลที่ฉันรักจะมีสุขภาพดีขึ้นถ้าพวกเขาเลือกที่จะออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันกังวลใจว่าฉันอาจจะหัวใจวายได้เช่นเดียวกับคนอื่นๆที่ไม่ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Self-reevaluation means emotional and cognitive reappraisal of values by the individual with the respect to the problem behavior.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันมีความมั่นใจมากยิ่งขึ้น เมื่อฉันได้ ออกกำลังกายสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันเชื่อว่าการออกกำลังกายอย่างสม่ำเสมอจะทำให้ฉันมีสุขภาพดีขึ้นและมีความสุขมากขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันมีความรู้สึกต่อตนเองดีขึ้น เมื่อฉัน ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกว่าฉันได้เอาใจใส่ในสุขภาพของตนเองเมื่อฉันออกกำลังกายอย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Environmental reevaluation means consideration and assessment by the individual of how the problem affects the physical and social environments.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันตระหนักดีว่าถ้าฉันไม่ออกกำลังกายอย่างสม่ำเสมอ ฉันอาจจะป่วยและเป็นภาระแก่ผู้อื่น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันคิดว่าการออกกำลังกายอย่างสม่ำเสมอ จะป้องกันฉันจากการต้องพึ่งพาระบบการดูแลสุขภาพอนามัย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันคิดว่าการออกกำลังกายอย่างสม่ำเสมอมีบทบาทต่อการลดค่าใช้จ่ายในการดูแลสุขภาพ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันตระหนักว่าการที่ฉันออกกำลังกายอย่างสม่ำเสมอจะเป็นแบบอย่างที่ดีแก่ลูก Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Social liberation means awareness, availability, and acceptance by the individual of alternative, problem-free life styles in society.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันสังเกตว่าผู้คนมากมายรู้ว่าการออกกำลังกายมีผลดีต่อพวกเขา Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันตระหนักว่ามีผู้ที่ทำให้การออกกำลังกายเป็นส่วนหนึ่งของชีวิตประจำวันมากขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันสังเกตว่าผู้ที่มีชื่อเสียงมักประชาสัมพันธ์ตนเองว่าออกกำลังกายสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันพบว่ามีกิจกรรมการออกกำลังกายมากขึ้นที่ศูนย์ผู้สูงอายุในชุมชนของฉัน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Counterconditioning means substitution of alternative behaviors for the problem behavior.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
เมื่อฉันรู้สึกเหนื่อยล้าฉันจะออกกำลังกายเพราะรู้ว่าจะรู้สึกดีขึ้นหลังจากนั้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันเลือกที่จะออกกำลังกาย แทนที่จะงีบสักครู่หลังทำงาน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันจะออกเดินหรือออกกำลังกายแทนที่จะพักผ่อน ด้วยการดูโทรทัศน์หรือรับประทานอาหาร Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
เมื่อฉันรู้สึกเศร้าโศกเสียใจ ฉันจะออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Helping relationship means trusting, accepting, and utilizing the support of caring others during attempts to change the problem behavior.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันมีเพื่อนๆและครอบครัวซึ่งคอยให้กำลังใจในการออกกำลังกาย เมื่อฉันไม่อยากทำ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
เพื่อนๆ และครอบครัวสนับสนุนให้ฉัน ออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันมีคนคอยให้กำลังใจให้ฉันออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันมีคนไปออกกำลังกายด้วย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Reinforcement management means changing the contingencies that control or maintain the problem behavior.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ประโยชน์อย่างหนึ่งของการออกกำลังกายอย่างสม่ำเสมอคือทำให้ฉันมีอารมณ์ดี Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันพยายามที่จะคิดว่าการออกกำลังกายเป็นเวลาที่จะทำให้จิตใจปลอดโปร่งไปพร้อมๆกับการทำให้ร่างกายแข็งแรง Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ถ้าฉันออกกำลังกายอย่างสม่ำเสมอ ฉันพบว่าฉันมีความรู้สึกกระชุ่มกระช่วย มีกำลังวังชาเพิ่มขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันชอบการได้คบหาสมาคมกับบุคคลอื่นเมื่อฉันออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Self-liberation means the individual's choice and commitment to change the problem behavior, including the belief that one can change.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันบอกตัวเองว่าถ้าฉันพยายามมากเพียงพอ ฉันจะออกกำลังกายได้อย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันให้คำมั่นสัญญาแก่ตนเองว่าจะออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันเชื่อว่าฉันสามารถออกกำลังกายได้อย่างสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันได้บอกผู้อื่นว่าฉันให้คำมั่นสัญญากับตัวเองว่าจะออกกำลังกายสม่ำเสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Stimulus control means control of situations and other causes that trigger the problem behavior

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันเก็บเสื้อผ้าที่ใช้ในการออกกำลังกายไว้ในที่สะดวกเพื่อที่จะได้หยิบใช้ทันทีที่ ฉันสามารถออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันกำหนดตารางการออกกำลังกายไว้ในปฏิทิน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันตรวจเช็คให้แน่ใจว่ามีเสื้อผ้าที่ใช้ในการ ออกกำลังกายที่สะอาดพร้อมอยู่เสมอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันวางสิ่งกระตุ้นเตือนให้ออกกำลังกายไว้ตามที่ต่างๆในบ้าน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

RESPONSE SHEET: CONTENT VALIDITY

DATE: _____VALIDATOR NAME: _____

SELF-EFFICACY FOR OVERCOMING BARRIERS OF EXERCISE

Self-efficacy for overcoming to barriers is the individual's perceived confident that she or he can do exercise in the face of various barriers. There are 6 categories of barriers: negative affect, excuse making, must exercise alone, inconvenient to exercise, resistance from other, and bad weather.

Definition: Negative Affect means negative emotion, feeling, or mood to exercise.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันตกอยู่ในภาวะเครียดมาก Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกหดหู่ ซึมเศร้า Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกวิตกกังวล Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกแก่เกินไป Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Excuse Making means providing explanations that show inner resistance to exercising.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันรู้สึกว่าฉันไม่มีเวลา Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกไม่อยากออกกำลังกายในขณะนี้ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันยุ่งกับงาน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันรู้สึกไม่สบายตัวเมื่อฉันออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันกำลังประสบกับปัญหาส่วนตัวหรือครอบครัว Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Must Exercise Alone means must exercise without the company of another person.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันอยู่ลำพังคนเดียว Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันต้องออกกำลังกายตามลำพัง Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
เพื่อนร่วมออกกำลังกายตัดสินใจไม่ ออกกำลังกายในวันนั้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Inconvenient to Exercise means something makes exercise a lot of trouble.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฉันขาดอุปกรณ์ในการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ฉันไม่ค่อยอยู่บ้านบ่อยๆ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
การเดินทางไม่สะดวก Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
สภาพแวดล้อมไม่ปลอดภัยสำหรับการเดิน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Resistance from Others means other people discourage the person from exercising.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
เพื่อนๆ ไม่ต้องการให้ฉันออกกำลังกาย	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
Comments:			
ครอบครัวของฉันไม่ต้องการให้ฉันออกกำลังกาย	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
Comments:			
ฉันใช้เวลาอยู่กับเพื่อนๆหรือครอบครัวที่ไม่ ออกกำลังกาย	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
Comments:			

Definition: Bad Weather means the weather is not favorable to exercise.

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ฝนกำลังตก Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
อากาศร้อนเกินไป Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
อากาศมีมลพิษ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ถนนหรือทางเดินเท้าลื่น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

RESPONSE SHEET: CONTENT VALIDITY

DATE: _____ VALIDATOR NAME: _____

SOCIAL INFLUENCES ON EXERCISE

Social influence is the effect of the real or imagined presence of other people on behavior. There are 6 categories: companionship support, informational support, esteem support, inhibitive behavior, justifying behavior, and criticizing behavior.

Definition: Companionship Support means partnership assistance that suggests "we participate together" (components: coplanning, cooperation, coparticipation, reminding, rescheduling, offering, willingness).

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
วางแผนร่วมกันกับคุณในการออกกำลังกายร่วมกัน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ออกกำลังกายร่วมกันกับคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
สัญญากับคุณว่าพวกเขาจะร่วมออกกำลังกายกับคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
เตือนคุณให้ร่วมออกกำลังกายกับพวกเขา Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
เปลี่ยนแปลงตารางเวลาของพวกเขาเพื่อให้คุณร่วมออกกำลังกายด้วยได้ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Informational Support means knowledge assistance that suggests "you should know" (components: enlightenment, rationalization, clarification, program referral, intensity suggestion, activity recommendation, supporter referral, problem-solving, and goal direction).

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ให้ข้อมูลเกี่ยวกับผลดีของการออกกำลังกายที่มีต่อสุขภาพของคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
อธิบายให้คุณฟังว่าทำไมการออกกำลังกายจึงสำคัญต่อการเปลี่ยนแปลงสุขภาพของคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ให้ความกระจ่างถึงวิธีที่จะบรรลุเป้าหมายสุขภาพดีด้วยการออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
แนะนำโปรแกรมและสถานที่สำหรับการ ออกกำลังกายที่อาจส่งเสริมให้คุณมีสุขภาพดี Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
อธิบายให้คุณทราบถึงระยะเวลา ความถี่ หรือความหนักหน่วงของการออกกำลังกายที่จำเป็นในการทำให้สุขภาพดีขึ้น Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Esteem support means esteem information provision that suggests " you are good" (components: mastery recognition, social comparison, affirmation, respect, reinforcement, interest, and reassurance).

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
ชมเชยคุณในความเชี่ยวชาญทางทักษะ การออกกำลังกาย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ยกย่องระดับการออกกำลังกายของคุณว่าเหนือกว่าผู้อื่นในวัยเดียวกัน Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ยืนยันว่าคุณออกกำลังกายได้ดี Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
พวกเขาแสดงความนับถือความสามารถที่ดีในการออกกำลังกายได้หลายประเภทของคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
กล่าวว่าคุณควรภูมิใจในทักษะการออกกำลังกายของคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Inhibitive Behavior means disapproval and discouraging behavior that suggests "you should not do exercise" (components: warning, delimitation, worrying, forbidding, threatening, disapproving, and rejection).

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
เตือนคุณว่าการเริ่มออกกำลังกายจะทำให้สุขภาพแย่ลง Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บอกให้คุณหลีกเลี่ยงการออกกำลังกาย เพื่อหลีกเลี่ยงการบาดเจ็บหรือสุขภาพแย่ลง Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บอกให้คุณหลีกเลี่ยงการออกกำลังกาย เพื่อจะได้ไม่ล้มหรือได้รับอุบัติเหตุ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
ห้ามไม่ให้คุณออกกำลังกายเพราะมีความเสี่ยงต่อสุขภาพ	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
Comments:			

Definition: Justifying Behavior means excusing and overprotective behavior that suggests "you don't need to do exercise" (components: excuse-giving, compromising, exempting, pardoning, and ignoring).

Item	A. Does this item fit the definition?	B. Is this item unique?	C. Is this item clear?
บอกคุณว่าไม่จำเป็นต้องออกกำลังกายเพิ่มขึ้นอีก เพราะคุณมีงานประจำอื่นๆ ที่วุ่นวายมากพออยู่แล้ว Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บอกคุณว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะคุณมีสุขภาพดีเพียงพอ แล้ว Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บอกคุณว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะคุณรู้จักวิธีดูแลสุขภาพตนเอง Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บอกคุณว่าไม่จำเป็นต้องออกกำลังกายมากขึ้นอีกเพราะไม่เหมาะสมกับวัยของคุณ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

Definition: Criticizing Behavior means demanding and blaming behavior that suggests "you are not good at doing exercise" (components: exclusion, demanding, nagging, contempt, bothering, depressing, and ridicule)

Item	A. Does this tem fit the definition?	B. Is this item unique?	C. Is this item clear?
ไม่ให้คุณเข้าร่วมในการออกกำลังกาย เพราะว่าคุณมีความสามารถในการออกกำลังกายน้อย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บังคับให้คุณออกกำลังกายแบบที่คุณไม่ชอบ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
บ่นว่าทักษะในการออกกำลังกายของคุณไม่ดีพอ Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No
วิจารณ์ว่าคุณมีทักษะในการออกกำลังกายน้อย Comments:	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No

RESPONSE SHEET: CONTENT VALIDITY

DATE: _____VALIDATOR NAME: _____

EXERCISE CRITERIA FOR STAGES OF CHANGE FOR EXERCISE

Please read the definition of exercise criteria and then answer questions below.

การออกกำลังกาย เป็นกิจกรรมที่มีการเคลื่อนไหวของร่างกายที่ได้ถูกวางแผนกำหนดไว้ เพื่อเพิ่มความแข็งแรงของร่างกาย เช่น การเดินเร็ว วิ่งเหยาะ ปั่นจักรยาน ว่ายน้ำ เต้นรำหรือ กิจกรรมอื่นๆ ที่มีลักษณะคล้ายกัน

การออกกำลังกายสม่ำเสมอ หมายถึง การออกกำลังกายสะสมในแต่ละวัน เป็นเวลาอย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์ ในระดับที่ทำให้การหายใจเร็วขึ้นและมีเหงื่อออก

ตัวอย่างเช่น ในวันหนึ่งคุณเดินเร็วนาน 30 นาที 1 ครั้ง หรือเดินเร็วครั้งละ 10 นาที 3 ครั้ง ถ้าคุณปฏิบัติอย่างน้อยในระดับนี้ในเกือบทุกวันของสัปดาห์ ที่ทำให้การหายใจเร็วขึ้นและมีเหงื่อออก หมายความว่าคุณออกกำลังกายอย่างสม่ำเสมอ

Please answer these questions.

1. Is this definition clear and understandable for Thais?

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2. Any comments and suggestions.

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RESPONSE SHEET: CONTENT VALIDITY

DATE: _____VALIDATOR NAME: _____

PHYSICAL ACTIVITY

Please read a list of physical activity types and then answer questions below.

1. ไปเยี่ยมเพื่อน ๆหรือครอบครัว (ไม่รวมคนที่คุณอาศัยอยู่ด้วย)
2. ไปชมรมผู้สูงอายุ
3. ทำงานอาสาสมัคร
4. ช่วยดูแลศาสนสถาน เช่น กวาดลานวัด
5. เข้าร่วมกิจกรรมของสโมสรหรือการพบปะประชุมกลุ่ม เช่น กิจกรรมโรตารี ลูกเสือชาวบ้าน
6. ใช้คอมพิวเตอร์
7. เต้นรำ (ยกเว้นการเต้นแอโรบิค)
8. ทำงานฝีมือ เช่น งานไม้ งานเย็บ วาดภาพ และงานศิลปะอื่น
9. เล่นกอล์ฟพร้อมลากอุปกรณ์ด้วยตนเอง (นับเฉพาะช่วงเวลาที่เดิน)
10. เล่นกอล์ฟโดยอาศัยรถกอล์ฟ (นับเฉพาะช่วงเวลาที่เดิน)
11. ไปดูคอนเสริ์ต ,ภาพยนตร์, ฟังการบรรยาย, หรือดูการแข่งขันกีฬา
12. เล่นไพ่ เกมส์บิงโก หรือหมากกระดานกับคนอื่น ๆ หรือกับลูกหลาน
13. แทงสนุ๊กเกอร์หรือบิลเลียด
14. เล่นเทนนิสเดี่ยว (ไม่นับเทนนิสคู่)
15. เล่นเทนนิสคู่ (ไม่นับเทนนิสเดี่ยว)
16. เล่นดนตรี
17. อ่านหนังสือ
18. ทำงานหนักรอบ ๆบ้าน เช่น ล้างหน้าต่าง ทำความสะอาดรางน้ำฝน หรือขัดถูพื้นภายในบ้าน
19. ทำงานเบา ๆบริเวณบ้าน เช่น กวาดบ้าน หรือให้อาหารสัตว์เลี้ยง
20. ทำงานสวนอย่างหนัก เช่น ยกของหนัก , ขุดดินโดยใช้จอบหรือเสียม, กวาดด้วยคราด
21. ทำสวนเบาๆ เช่น รดน้ำต้นไม้
22. ดูแลซ่อมเกี่ยวกับรถยนต์ รถบรรทุก รถตัดหญ้าหรือเครื่องจักรอื่นๆ
23. วิ่งเหยาะ ๆ หรือวิ่งเร็ว
24. เดินเร็วเพื่อออกกำลังกาย (ไม่นับเวลาเดินเล่น)

25. เดินเพื่อไปทำธุระ เช่น ไปร้านค้า หรือพาเด็ก ๆ ไปโรงเรียน (นับเฉพาะเวลาเดิน)
26. เดินเล่นยามว่างเพื่อออกกำลังกายหรือเพื่อความเพลิดเพลิน (เช่นเดินสมาธิ)
27. ขี่จักรยาน หรือปั่นจักรยานอยู่กับที่
28. ใช้เครื่องช่วยออกกำลังกายแบบแอโรบิก เช่น ขั้นบันได (ไม่รวมลู่วิ่งสายพานหรือจักรยานปั่น)
29. เล่นออกกำลังกายในน้ำ (ไม่รวมการว่ายน้ำ)
30. ว่ายน้ำช้าๆ
31. เล่นกีฬาแบบยืดหยุ่นกล้ามเนื้อ (ไม่นับโยคะหรือไทเก๊ก)
32. เล่นโยคะหรือไทเก๊ก
33. เต้นแอโรบิค
34. ฝึกความแข็งแรงของกล้ามเนื้อ ในระดับปานกลางถึงหนัก เช่น ยกน้ำหนักมากกว่า 2.5 กิโลกรัม หรือวิดพื้น
35. ฝึกความแข็งแรงของกล้ามเนื้อในระดับเบา เช่น ยกน้ำหนักน้อยกว่า 2.5 กิโลกรัม หรือใช้แผ่นยางยืด
36. ออกกำลังกายเพื่อคงสภาพกล้ามเนื้อ เช่น ออกกายบริหาร ออกกำลังโดยใช้เก้าอี้ (ไม่รวมการออกำลังกายเพื่อเพิ่มความแข็งแรงของกล้ามเนื้อ)
37. เล่นบาสเกตบอล หรือฟุตบอล (ไม่รวมเวลาขอบสนาม)

Please answer these questions.

1. Are these activities appropriate for Thais? ❑ Yes ❑ No

   Suggestion:

.....

.....

.....

.....

2. What other activities should be included?

.....

.....

.....

.....

APPENDIX D

APPROVALS OF THE INSTITUTIONAL REVIEW BOARDS

Research Compliance & Assurance, L [redacted]6 (503) 494-7887

MEMO

Date: August 21, 2002

To: *Napaporn Wanitkun MS SNORD*
Linda Felver SN5N [redacted] AUG 2 2 2002

336

From: Gary T. Chiodo, DMD, Chair, Institutional Review Board, L106
Susan Hansen, MD, MPH, Co-Chair, Institutional Review Board, L106
Charlotte Shupert, PhD, Manager, Research Compliance and Assurance, L106

Subject: ***7259 EXP***
Validation of Questionnaires for Exercise Research Among Thai Middle-Aged and Older Adults with Coronary Artery Disease.

Initial Study Review
Protocol/Consent Form Approval

[■] **Your protocol/consent form is approved for One Year effective** AUG 2 2 2002**.**
You may use only copies of the attached approved consent form for the informed consent process. Please write the date of approval in the initial / annual approval date box in the upper right hand corner of the consent form. If you submit a revised consent form for approval during the coming year, you should type the initial approval date in this box when revising the form.

[ ] This study met the criteria established for waiver of consent in accordance with 45CFR46.116(d)(1-4). No consent form is required.

[■]This study met the criteria for EXPEDITED IRB review based on Category # 7[1] because this research employs survey and interview methodologies.

This approval may be revoked if the investigators fail to conduct the research in accordance with the guidelines found in the Roles and Responsibilities document (http://www.ohsu.edu/ra/rso/rgc/randr.pdf). Please note that any proposed changes in key personnel must be submitted to the IRB via a PRAF and approved prior to initiating the change. If you plan to discontinue your role as PI on this study or leave OHSU, you must arrange either (a) to terminate the study by so notifying the IRB and your department head, or (b) propose to transfer the responsibility of the PI to a new faculty member using a PRAF.

Investigators must provide subjects with a copy of the consent form, keep a copy of the signed consent form with the research records, and place a signed copy in the patient's hospital/clinical medical record (if applicable).

If this project involves the use of an Investigational New Drug, a copy of the approved protocol must be forwarded to the Pharmacy and Therapeutics Committee (Pharmacy Services - Investigational Drugs, CR9-4).

If this is a cancer study, we will notify the Oregon Cancer Institute (OCI) of the IRB approval. As the Principal Investigator, you are responsible for providing the OCI with copies of the final approved protocol/consent form.

1. 63 FR 60364-60367 (November 9, 1998).

คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล
ถนนพระราม 6 กทม. 10400
โทร. (662) 245-5704, 201-1296 โทรสาร (662) 246-2123

Faculty of Medicine, Ramathibodi Hospital, Mahidol University
Rama VI Road, Bangkok 10400, Thailand
Tel. (662) 245-5704, 201-1296 Fax (662) 246-2123

Documentary Proof of Ethical Clearance Committee on Human Rights Related to Researches Involving Human Subjects Faculty of Medicine, Ramathibodi Hospital, Mahidol University

1026/2002 (I)

Title of Project	Validation of Questionnaires for Exercise Research Among Middle-Aged and Older Adults with Coronary Artery Disease
Protocol Number	ID 11-45-34
Principal Investigator	Mrs. Napaporn Wanitkun
Official Address	Oregon Health & Science University

The aforementioned project has been reviewed and approved by Committee on Human Rights Related to Researches Involving Human Subjects, based on the Declaration of Helsinki.

Signature of Chairman
Committee on Human Rights Related to
Researches Involving Human Subjects [redacted]
Prof. Krisada Ratana-olarn, M.D., FRCST, FICS.

Signature of Dean ..... [redacted]
Prof. Prakit Vathesatogkit, M.D., ABIM.,FRCP.

Date of Approval November 20, 2002

Ethical Review Committee

of

Chest Disease Institute

Department of Medical Services

Ministry of Public Health

Title of Project : Validation of Questionnaires for Exercise Research Among Thai Middle-aged and Older Adults with Coronary Artery Disease

Investigator : Napaporn Wanitkun, R.N., M.S.

Place of Proposed Study : Chest Disease Institute

Approved by Ethical Review Committee, Chest Disease Institute, Department of Medical Services, Ministry of Public Health.

[redacted] Chairman

(Dr.Charoen Chuchottaworn,M.D.)

[redacted] Member and Secretary

(Dr.Thamarath Chantadansuwan,M.D.)

Date of Approval : December 1, 2002

APPENDIX E

CONSENT FORMS

IRB# 7259

Approved: August 30, 2002

OREGON HEALTH & SCIENCE UNIVERSITY

Informed Consent Form: Focus Group

TITLE: Validation of Questionnaires for Exercise Research Among Thai Middle-Aged and Older Adults With Coronary Artery Disease

PRINCIPAL INVESTIGATOR: Napaporn Wanitkun, R.N., M.S., (02) 419-7466 ext.1759

CO-INVESTIGATOR: Linda Felver, R.N., Ph.D.
Phone: (001-503) 494-3723

PURPOSE:

You have been invited to participate in this research study because you are older than 45 years old and have a problem with the blood supply to your heart. The purpose of this study is to develop questionnaires for use in Thailand that ask about exercise done by individuals who have heart disease and factors that affect how much they exercise. Exercise is recommended to prevent progress of heart disease. Some people have been successful in exercising regularly while others are not interested in exercise. Perspectives from a variety of people who exercise at different levels will assist health care providers to create appropriate exercise programs to help prevent and decrease the progression of heart disease. Your discussion and comments about the questionnaires will help in developing better questionnaires about exercise behavior for further studies.

Your participation in this study will last for approximately 2 hours. There will be 36 patients who complete the group discussions.

PROCEDURES:

If you agree to participate in this study, you will be asked to answer one short set of questions about how much you currently exercise and intend to exercise. The question is attached on page 4. This will take you 5 minutes or less to answer. Depending on your answer, you may be asked to participate in a group discussion. If you are not available at the scheduled discussion time or if that day's discussion group is already filled, you can tell the investigator whether or not you want to be contacted later to schedule a group discussion.

If you participate in the group discussion, you will be given a questionnaire packet and asked to complete it. The questions ask about your leisure time activities, your attitudes about exercise, and some information about yourself.

These questionnaires are anonymous. Please do not write your name on these. Each question has a list of possible answers. You will be asked to select a number that matches with your experiences or feelings. After you complete the questionnaires, you will be asked to discuss the clarity and appropriateness of the questions in the packet, with other patients.

It will take approximately 2 hours to answer all questions in the packet and participate in the group discussion. The questionnaire packet will be given to you in a conference room where the group discussion will occur. The investigator will be present during the time you fill out the questionnaires to answer any questions you may have about the forms and to conduct the group discussion. The group discussion will be tape-recorded for use in revising the questionnaires.

RISKS AND DISCOMFORTS:

There are no risks anticipated as a result of your participation in this study. There may be some inconvenience in spending the time necessary to complete the questionnaire packet and participate in the group discussion. You may refuse to answer any of the questions that you do not wish to answer.

BENEFITS:

You may or may not personally benefit from participating in this study. However, by serving as a subject, you may contribute new information which may benefit patients with coronary artery disease in the future.

ALTERNATIVES:

You may choose not to participate in this study. If you choose not to participate, it will not affect your relationship with your doctors, any of the clinic personnel, or the care you will receive.

CONFIDENTIALITY:

Neither your name nor your identity will be used for publication or publicity purposes. Your name will not be written on the questionnaires or mentioned aloud during the group discussion. All information provided to the investigator will be kept strictly confidential. Research records may be reviewed and/or copy by the Oregon Health & Science University Institutional Review Board. While the study is in process, all written

and taped materials will be locked in a file cabinet located in the investigator's office. The taped record will be destroyed after the study is completed.

COSTS:

There is no cost to participate in this study.

LIABILITY:

The Oregon Health & Science University is subject to the Oregon Tort Claims Act (ORS 30.260 through 30.300). If you suffer any injury and damage from this research project through the fault of the University, its officers or employees, you have the right to bring legal action against the University to recover the damage done to you subject to the limitations and conditions of the Oregon Tort Claims Act. You have not waived your legal right by signing this form. For clarification on this subject, or if you have further questions, please call the OHSU Research Support Office at (001-503) 494-7887.

PARTICIPATION:

Napaporn Wanitkun (02-419-7466 ext.1759) has offered to answer any other questions you may have about this study. If you have any questions regarding your rights as a research subject, you may contact the OHSU Research Support Office at (001-503) 494-7887. You may refuse to participate, or you may withdraw from this study at any time without affecting your relationship with or treatment at the Ramathibodi Hospital, Mahidol University, Bangkok, Thailand. You will be given a copy of this consent form.

SIGNATURES:

You have been clearly informed about participating procedures, benefits, and risks of this study. You agree to participate in both questionnaire completion and group discussion of this study. You may refuse to participate, or you may withdraw from this study at any time without affecting your relationship with or treatment at this hospital. All information will be held in confidence by the investigator and the OHSU Institutional Review Board. Any release of information derived from this information to scientific organizations, medical journal, etc. will be done only without your identification.

You will be given a copy of this consent form. Your signature below indicates that you have read the foregoing and agree to participate in this study.

_____ _____

Participant's signature Date

_____ _____

Person obtaining participant's signature Date

Please go to the next page and answer a question to determine your stages of change for exercise. Thank you.

Stages of Change for Exercise

The following 5 statements will assess how much you currently exercise in your leisure time (exercise done outside of a job).

Exercise is any planned physical activity performed to increase physical fitness (e.g. brisk walking, jogging, bicycling, swimming, dancing, or any other physical activity where effort is similar to this).
Regular exercise means accumulating 30 minutes or more of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat.
For example, in one day you could take one 30-minute brisk walk or three 10-minute brisk walks. If you do at least this amount of exercise most days of the week at a level that increases your breathing rate and causes you to break a sweat, then you are doing regular exercise.

Do you EXERCISE REGULARLY (accumulating 30 minutes or more of exercise most days of the week) according to the definition above?

Please mark only ONE of the five statements.

- ❑ 1. No, and I do NOT INTEND to begin exercising regularly in the next 6 months.
- ❑ 2. No, but I intend to begin exercising regularly in the next 6 months.
- ❑ 3. No, but I intend to begin exercising regularly in the next 30 days.
- ❑ 4. Yes, I have been exercising, but for LESS than 6 months.
- ❑ 5. Yes, I have been exercising for MORE than 6 months.

Please give this form back to the investigator. Thank you.

IRB# 7259

Approved: August 30, 2002

OREGON HEALTH & SCIENCE UNIVERSITY

Informed Consent Form: Questionnaire

TITLE: Validation of Questionnaires for Exercise Research Among Thai Middle-Aged and Older Adults With Coronary Artery Disease

PRINCIPAL INVESTIGATOR: Napaporn Wanitkun, R.N., M.S. (02) 419-7466 ext.1759

CO-INVESTIGATOR: Linda Felver, R.N., Ph.D.
Phone: (001-503) 494-3723

PURPOSE:

You have been invited to participate in this research study because you are older than 45 years old and have a problem with the blood supply to your heart. The purpose of this study is to develop questionnaires for use in Thailand that ask about exercise done by individuals who have heart disease and factors that affect how much they exercise. Exercise is recommended to prevent the progression of heart disease. Some people have been successful in exercising regularly while others are not interested in exercise. Perspectives from a variety of people who exercise at different levels will assist health care providers to create appropriate exercise programs to help prevent and decrease progress of heart disease. Your responses on the questionnaires will help in developing better questionnaires about exercise behavior for further studies.

Your participation in this study will last for approximately 45-50 minutes. There will be 460-500 patients who complete this questionnaire packet.

PROCEDURES:

If you agree to participate in this study, you will be given a questionnaire packet and asked to complete it. The questions ask about your leisure time activities, your attitudes about exercise, and some information about yourself.

These questionnaires are anonymous. Please do not write your name on these. Each question has a list of possible answers. You will be asked to select a number that matches with your experiences or feeling.

The questionnaire packet will be given to you after you sign this consent form. The investigator will be present during the time you fill out the questionnaires to answer questions you may have about filling out the forms.

RISKS AND DISCOMFORTS:

There are no risks anticipated as a result of your participation in this study. There may be some inconvenience in spending the time necessary to complete the questionnaire packet. You may refuse to answer any of the questions that you do not wish to answer.

BENEFITS:

You may or may not personally benefit from participating in this study. However, by serving as a subject, you may contribute new information which may benefit patients in the future.

ALTERNATIVES:

You may choose not to participate in this study. If you choose not to participate, it will not affect your relationship with your doctors, any of the clinic personnel, or the care you will receive.

CONFIDENTIALITY:

Neither your name nor your identity will be used for publication or publicity purposes. All information provided to the investigator will be kept strictly confidential. Research records may be reviewed and/or copy by the Oregon Health & Science University Institutional Review Board. While the study is in process, all written materials will be locked in a file cabinet located in the investigator's office.

COSTS:

There is no cost to participate in this study.

LIABILITY:

The Oregon Health & Science University is subject to the Oregon Tort Claims Act (ORS 30.260 through 30.300). If you suffer any injury and damage from this research project through the fault of the University, its officers or employees, you have the right to bring legal action against the University to recover the damage done to you subject to the limitations and conditions of the Oregon Tort Claims Act. You have not waived your legal right by signing this form. For clarification on this subject, or if you have further questions, please call the OHSU Research Support Office at (001-503) 494-7887.

PARTICIPATION:

Napaporn Wanitkun (02-419-7466 ext.1759) has offered to answer any other questions you may have about this study. If you have any questions regarding your rights as a research subject, you may contact the OHSU Research Support Office at (001-503) 494-7887. You may refuse to participate, or you may withdraw from this study at any time without affecting your relationship with or treatment at the Siriraj Hospital and Ramathibodi Hospital, Mahidol University and Central Chest Hospital, Bangkok, Thailand. You will be given a copy of this consent form.

SIGNATURES:

You have been clearly informed about participating procedures, benefits, and risks of this study. You agree to participate in this study. You may refuse to participate, or you may withdraw from this study at any time without affecting your relationship with or treatment at this hospital. All information will be held in confidence by the investigator and the OHSU Institutional Review Board. Any release of information derived from this information to scientific organizations, medical journal, etc. will be done only without your identification.

You will be given a copy of this consent form. Your signature below indicates that you have read the foregoing and agree to participate in this study.

_____ _____

Participant's signature Date

_____ _____

Person obtaining participant's signature Date

IRB # 7259
Approved: August 30, 2002

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจสำหรับการศึกษาระยะที่ 1: การสนทนากลุ่ม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย:

นางนภาพร วาณิชย์กุล, วทบ. (พยาบาล), วท.ม. โทร. (02) 419-7466 ต่อ 1759

ผู้ควบคุมวิทยานิพนธ์:

ดร. ลินดา เฟลเวอร์, Ph.D. โทร. (001) 503-494-3723

วัตถุประสงค์:

ท่านได้รับเชิญเข้าร่วมในการศึกษานี้เนื่องจากท่านมีโรคหลอดเลือดหัวใจและมีอายุตั้งแต่ 45 ปีขึ้นไป วัตถุประสงค์ของการศึกษานี้เพื่อพัฒนาแบบสอบถามเกี่ยวกับการออกกำลังกายและปัจจัยที่มีอิทธิพลต่อการออกกำลังกาย สำหรับผู้ที่มีโรคหลอดเลือดหัวใจชาวไทย การออกกำลังกายได้รับการยอมรับว่าช่วยป้องกันโรค หลอดเลือดหัวใจไม่ให้เป็นเพิ่มขึ้น หลายท่านประสบความสำเร็จในการออกกำลังกายได้อย่างสม่ำเสมอ แต่หลายๆ ท่านไม่มีความสนใจในการออกกำลังกาย แง่มุมความคิดเห็นจากผู้ที่มีความแตกต่างในระดับของการออกกำลังกาย จะเป็นแนวทางให้ผู้ให้บริการทางสุขภาพสามารถพัฒนาโครงการการออกกำลังกาย ที่เหมาะสม เพื่อป้องกันหรือชะลอ กระบวนการของโรค ข้อมูลจากการอภิปรายและข้อเสนอแนะของท่านเกี่ยวกับแบบสอบถามนี้จะมีส่วนช่วยอย่าง สำคัญในการพัฒนาแบบสอบถาม พฤติกรรมการออกกำลังกายเพื่อใช้ ในการศึกษาต่อไป

การเข้าร่วมการศึกษานี้ใช้เวลาประมาณ 2 ชั่วโมง ผู้ป่วยจำนวน 36 ท่าน จะเข้าร่วมในการอภิปรายกลุ่ม

ขั้นตอนวิธีวิจัย:

หากท่านยินดีเข้าร่วมในการศึกษานี้ เบื้องต้นท่านจะได้รับข้อคำถาม 1 ข้อเกี่ยวกับระดับการออกกำลังกาย ของท่านในปัจจุบัน (คำถามอยู่ที่หน้า 5) ท่านจะใช้เวลาประมาณ 5 นาทีในการตอบ ท่านอาจได้รับเชิญให้ร่วมในการ อภิปรายกลุ่มต่อไป ขึ้นอยู่กับคำตอบของท่านเบื้องต้น หากท่านไม่สะดวก ในวันที่ กำหนดหรือในวันนั้นมีผู้สนใจเข้า ร่วมอภิปรายกลุ่มเต็มแล้ว กรุณาแจ้งแก่ผู้วิจัยว่าท่าน มีความประสงค์จะ ได้รับการติดต่อนัดมาอภิปรายกลุ่มใน ภายหลังหรือไม่

ถ้าท่านเข้าร่วมในการอภิปรายกลุ่ม ผู้วิจัยจะมอบแบบสอบถามแก่ท่าน 1 ชุด เพื่อให้ท่านตอบข้อคำถาม ซึ่งจะถามเกี่ยวกับกิจกรรมของท่านขณะพักผ่อนหย่อนใจ ทัศนคติของท่านเกี่ยวกับการออกกำลังกาย และข้อมูล บางอย่างเกี่ยวกับท่าน

ชุดแบบสอบถามจะไม่ปรากฏชื่อของท่านเพื่อให้ท่านสามารถตอบแบบสอบถามได้อย่างอิสระ ดังนั้น กรุณา อย่าเขียนชื่อของท่านในแบบสอบถาม ข้อคำถามเป็นแบบตัวเลือกหลายข้อ ขอให้ท่าน เลือกจำนวนตัวเลขที่ตรงกับ ประสบการณ์หรือความรู้สึกของท่าน เมื่อท่านเสร็จการตอบแบบสอบถาม ผู้วิจัยจะขอให้ท่านอภิปรายกับผู้ตอบแบบ สอบถามท่านอื่นๆ เกี่ยวกับความชัดเจนและความเหมาะสม ของคำถามต่างๆ

การตอบแบบสอบถามและการอภิปรายกลุ่มจะใช้เวลาประมาณ 2 ชั่วโมง ท่านจะมีโอกาสตอบแบบสอบถาม และอภิปรายกลุ่มในห้องประชุมเล็กที่เหมาะสม ผู้วิจัยจะอยู่ในห้องประชุมด้วยเพื่อตอบคำถามที่ ท่านอาจสงสัยในการ ตอบแบบสอบถามและเพื่อดำเนินการอภิปรายกลุ่ม การอภิปรายกลุ่มจะได้รับการบันทึกเทปเพื่อใช้ในการปรับปรุง แบบสอบถามให้ดียิ่งขึ้น

ความเสี่ยงและความไม่สะดวกที่อาจเกิดขึ้น:

การเข้าร่วมในการศึกษานี้ไม่คาดว่าจะเกิดความเสี่ยงแก่ท่าน อาจเกิดความไม่สะดวกในการใช้เวลาในการ ตอบแบบสอบถามและการอภิปรายกลุ่ม ท่านอาจไม่ตอบคำถามในบางข้อได้ตามที่ท่านเห็นสมควร

ประโยชน์:

ท่านอาจได้รับประโยชน์บ้างจากการเข้าร่วมการศึกษานี้ อย่างน้อยที่สุดข้อมูลใหม่ที่ท่านให้แก่การศึกษานี้ อาจเป็นประโยชน์อย่างยิ่งแก่ผู้ป่วยโรคหลอดเลือดหัวใจในอนาคต ข้อมูลที่ได้จะช่วยนำไปสู่การศึกษาเพื่อการ พัฒนาโครงการการออกกำลังกายในการป้องกันหรือชะลอความรุนแรงของโรคหลอดเลือดหัวใจ

ทางเลือกอื่น:

ท่านอาจตัดสินใจไม่เข้าร่วมการศึกษานี้ การที่ท่านไม่เข้าร่วมการศึกษานี้จะไม่มีผลกระทบต่อความสัมพันธ์ ของท่านกับแพทย์และบุคลากรอื่นๆ รวมทั้งไม่มีผลกระทบต่อการดูแลรักษาของท่านแต่อย่างใด

ความลับของข้อมูล:

ชื่อและข้อมูลที่อาจบ่งชี้ถึงตัวท่านจะไม่ถูกเปิดเผยในการตีพิมพ์ผลการศึกษาหรือในที่สาธารณะ จะไม่มีการ บันทึกชื่อของท่านในแบบสอบถาม และไม่เอ่ยชื่อของท่านในการอภิปรายกลุ่ม ข้อมูลที่ท่านให้ แก่การศึกษานี้จะได้รับ การเก็บไว้เป็นความลับอย่างเคร่งครัดและทำสำเนาแก่สำนักงานสนับสนุนการวิจัยแห่งมหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์โอเรกอน เพื่อตรวจสอบความครบถ้วนและถูกต้องของข้อมูล ในระหว่างที่การศึกษานี้ยังดำเนินการอยู่ แบบสอบถามที่ท่านตอบและแถบบันทึกเสียงการอภิปรายจะได้รับการเก็บไว้ที่สำนักงานของผู้วิจัยอย่างปลอดภัย แถบบันทึกเสียงจะถูกทำลายเมื่อการศึกษาสิ้นสุดลง

ค่าใช้จ่าย: ท่านไม่ต้องเสียค่าใช้จ่ายใดๆทั้งสิ้นในการเข้าร่วมการศึกษานี้

ความรับผิดชอบในการวิจัย:

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอนอยู่ภายใต้กฎหมายคุ้มครองของรัฐโอเรกอน สหรัฐอเมริกา (ORS 30.260 ถึง 30.300) ถ้าท่านได้รับผลเสียหายจากการศึกษานี้จากบุคลากรของมหาวิทยาลัย ท่านสามารถ ฟ้องร้องทางกฎหมายต่อมหาวิทยาลัยได้ตามข้อกำหนดของกฎหมายดังกล่าว การเซ็นใบยินยอม เข้าร่วมการศึกษานี้ ไม่เป็นการสละสิทธิ์ทางกฎหมายของท่านแต่อย่างใด ถ้าท่านมีข้อสงสัย เพิ่มเติม สามารถติดต่อสำนักงาน สนับสนุนการวิจัย แห่งมหาวิทยาลัยสุขภาพและวิทยาศาสตร์ โอเรกอน ที่หมายเลขโทรศัพท์ 001-503-494-7887

การเข้าร่วมการวิจัย:

หัวหน้าผู้วิจัย นภาพร วาณิชย์กุล (โทร. 02-419-7466 ต่อ 1759) ยินดีที่จะให้ข้อมูลหรือตอบข้อสงสัย แก่ทุกท่าน เกี่ยวกับการเข้าร่วมการศึกษานี้ ถ้าท่านมีข้อสงสัยเกี่ยวกับสิทธิ์ของท่านในการเข้าร่วมการศึกษา สามารถ สอบถามได้ที่ สำนักงานสนับสนุนการวิจัย แห่งมหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์โอเรกอน โทร. 001-503-494-7887 ท่านสามารถปฏิเสธหรือยุติการเข้าร่วมการวิจัยได้โดยที่ไม่มีผลต่อการได้รับบริการ และการ รักษาของท่านที่โรงพยาบาลโรคทรวงอกแต่ประการใด ท่านจะได้รับสำเนาใบยินยอมนี้เพื่อเก็บไว้อ้างอิง ด้วย 1 ฉบับ

<u>คำยินยอมของผู้เข้าร่วมการวิจัย:</u>

ท่านได้รับทราบรายละเอียดของโครงการศึกษาตลอดจนประโยชน์ และ ข้อเสี่ยงที่จะเกิดขึ้นต่อท่านจากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้นและยินยอมให้ทำการวิจัยในโครงการที่มีชื่อข้างต้น และท่าน รู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ท่านสามารถสอบถามสอบถามผู้วิจัยได้ ท่านยินดีเข้าร่วมการศึกษาทั้งการตอบ แบบสอบถามและการเข้าร่วมกลุ่มสนทนา ท่านสามารถไม่เข้าร่วมการศึกษานี้เมื่อใดก็ได้ โดยไม่มีผลกระทบต่อการ รักษาที่ท่านพึงได้รับ นอกจากนี้ ผู้วิจัยและสำนักงานสนับสนุนการวิจัย แห่ง มหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์ โอเรกอน จะเก็บข้อมูลเฉพาะเกี่ยวกับตัวท่านเป็นความลับและจะเปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวท่านต่อหน่วยงานที่เกี่ยวข้อง กระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ลายเซ็นของท่านด้านล่างนี้รับรองถึงการที่ท่านได้อ่านข้อความดังกล่าวข้างต้นและยินยอมเข้าร่วมการศึกษานี้

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ลงชื่อผู้เข้าร่วมการวิจัย วันที่

_____ _____

ผู้ขอความยินยอม วันที่

กรุณาเปิดไปหน้าถัดไปแล้วตอบคำถามว่า ระยะการออกกำลังกายของท่านอยู่ในระดับใด

ขอขอบคุณอย่างยิ่ง

ขั้นตอนการเปลี่ยนแปลงพฤติกรรมการออกกำลังกาย

ข้อความทั้ง 5 ต่อไปนี้จะประเมินว่า ในปัจจุบันนี้คุณใช้เวลาว่างในการออกกำลังกายมากน้อยเพียงใด (การออกกำลังกายนอกเหนือจากงานประจำ)

การออกกำลังกาย เป็นกิจกรรมที่มีการเคลื่อนไหวของร่างกายที่ได้ถูกวางแผนกำหนดไว้ เพื่อเพิ่มความแข็งแรงของร่างกาย เช่น การเดินเร็ว การวิ่งเหยาะๆ การปั่นจักรยาน การว่ายน้ำ การเต้นรำ หรือกิจกรรมอื่นๆที่มีลักษณะคล้ายกัน

การออกกำลังกายสม่ำเสมอ หมายถึง **การออกกำลังกายสะสมในแต่ละวัน เป็นเวลาอย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์** ในระดับที่ทำให้ **การหายใจเร็วขึ้นและมีเหงื่อออก**

ตัวอย่างเช่น ในวันหนึ่งคุณเดินเร็วนาน 30 นาที 1 ครั้ง หรือเดินเร็วครั้งละ 10 นาที 3 ครั้ง ถ้าคุณปฏิบัติอย่างน้อยในระดับนี้ในเกือบทุกวันของสัปดาห์ ที่ทำให้การหายใจเร็วขึ้นและมีเหงื่อออก หมายความว่าคุณออกกำลังกายอย่างสม่ำเสมอ

คุณ**ออกกำลังกายสม่ำเสมอ**(สะสมในแต่ละวันเป็นเวลา อย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์) ตามคำจำกัดความข้างต้นหรือไม่?

กรุณาเลือกตอบ**เพียงข้อเดียว**จาก 5 ตัวเลือกต่อไปนี้

- ☐ 1. ไม่, และฉัน**ไม่มีความตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอภายใน 6 เดือนข้างหน้า
- ☐ 2. ไม่, แต่ฉัน**ตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในอีก 6 เดือนข้างหน้า**
- ☐ 3. ไม่, แต่ฉัน**ตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในระยะ 30 วันข้างหน้า**
- ☐ 4. ใช่, ฉัน**ออกกำลังกายอย่างสม่ำเสมอ**มาแล้วแต่ **น้อยกว่า 6 เดือน**
- ☐ 5. ใช่, ฉัน**ออกกำลังกายอย่างสม่ำเสมอ**มาแล้วเป็น**เวลานานกว่า 6 เดือน**

กรุณาคืนแบบสอบถามนี้แก่ผู้วิจัย ขอขอบคุณ

IRB # 7259
Approved: August 30, 2002

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจสำหรับการศึกษาระยะที่ 2: แบบสอบถาม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย:

นางนภาพร วาณิชย์กุล, วทบ. (พยาบาล), วท.ม. โทร. (02) 419-7466 ต่อ 1759

ผู้ควบคุมวิทยานิพนธ์:

ดร. ลินดา เฟลเวอร์, Ph.D. โทร. (001) 503-494-3723

วัตถุประสงค์:

ท่านได้รับเชิญเข้าร่วมในการศึกษานี้เนื่องจากท่านมีโรคหลอดเลือดหัวใจและมีอายุตั้งแต่ 45 ปีขึ้นไป วัตถุประสงค์ของการศึกษานี้เพื่อพัฒนาแบบสอบถามเกี่ยวกับการออกกำลังกายและปัจจัยที่มีอิทธิพลต่อการออกกำลังกาย สำหรับผู้ที่มีโรคหลอดเลือดหัวใจชาวไทย
การออกกำลังกายได้รับการยอมรับว่าช่วยป้องกันโรค หลอดเลือดหัวใจไม่ให้เป็นเพิ่มขึ้น
หลายท่านประสบความสำเร็จในการออกกำลังกายได้อย่างสม่ำเสมอ แต่
หลายๆท่านไม่มีความสนใจในการออกกำลังกาย แง่มุมความคิดเห็นจากผู้ที่มีความแตกต่างในระดับของการออกกำลังกายจะเป็นแนวทางให้ผู้ให้บริการทางสุขภาพสามารถพัฒนาโครงการการออกกำลังกายที่เหมาะสมเพื่อป้องกันหรือชลอกระบวนการของโรค ข้อมูลจากการตอบแบบสอบถามของท่านจะมีส่วนช่วยอย่างสำคัญในการพัฒนาแบบสอบถาม พฤติกรรมการออกกำลังกายเพื่อใช้ในการศึกษาต่อไป

การเข้าร่วมการศึกษานี้ใช้เวลาประมาณ 45-50 นาที คาดว่าจะมีผู้เข้าร่วมตอบแบบสอบถามในการศึกษานี้ ประมาณ 450-500 ท่าน

ขั้นตอนวิธีวิจัย:

หากท่านยินดีเข้าร่วมในการศึกษานี้ ผู้วิจัยจะมอบแบบสอบถามแก่ท่าน 1 ชุดเพื่อให้ท่านตอบข้อคำถาม ซึ่งจะถามเกี่ยวกับกิจกรรมของท่านขณะพักผ่อนหย่อนใจ ทัศนคติของท่านเกี่ยวกับการออกกำลังกาย และข้อมูล บางอย่างเกี่ยวกับท่าน

ชุดแบบสอบถามจะไม่ปรากฏชื่อของท่านเพื่อให้ท่านสามารถตอบแบบสอบถามได้อย่างอิสระ ดังนั้นกรุณา อย่าเขียนชื่อของท่านในแบบสอบถาม ข้อคำถามเป็นแบบตัวเลือกหลายข้อ ขอให้ท่านเลือกตัวเลขที่ตรงกับ ประสบการณ์ หรือ ความรู้สึกของท่าน

ผู้วิจัยจะมอบแบบสอบถามชุดนี้หลังจากที่ท่านลงชื่อในใบยินยอมเข้าร่วมการศึกษาฉบับนี้ แล้วผู้วิจัยจะ อยู่ด้วยในขณะที่ท่านตอบแบบสอบถามและพร้อมที่จะตอบข้อสงสัยในการตอบแบบสอบถาม

ความเสี่ยงและความไม่สะดวกที่อาจเกิดขึ้น:

การเข้าร่วมในการศึกษานี้ไม่เกิดความเสี่ยงแก่ท่าน อาจเกิดความไม่สะดวกในการใช้เวลาในการตอบ แบบสอบถาม ท่านมีสิทธิที่จะไม่ตอบคำถามในบางข้อได้ตามที่ท่านเห็นสมควร

ประโยชน์:

ท่านอาจได้รับประโยชน์บ้างจากการเข้าร่วมการศึกษานี้ อย่างน้อยที่สุดข้อมูลใหม่ที่ท่านให้แก่การศึกษานี้ อาจเป็นประโยชน์อย่างยิ่งแก่ผู้ป่วยในอนาคต ข้อมูลที่ได้จะช่วยนำไปสู่การศึกษาเพื่อการพัฒนาโครงการการ ออกกำลังกาย เพื่อป้องกันหรือชะลอความรุนแรงโรคหลอดเลือดหัวใจ

ทางเลือกอื่น:

ท่านอาจตัดสินใจไม่เข้าร่วมการศึกษานี้ การที่ท่านไม่เข้าร่วมการศึกษานี้จะไม่มีผลกระทบต่อความสัมพันธ์ของท่านกับแพทย์และบุคลากรอื่นๆ รวมทั้งไม่มีผลกระทบต่อการดูแลรักษาของท่านแต่อย่างใด

ความลับของข้อมูล:

ชื่อและข้อมูลที่อาจบ่งชี้ถึงตัวท่านจะไม่ถูกเปิดเผยในการตีพิมพ์ผลการศึกษาหรือในที่สาธารณะ จะไม่มีการ บันทึกชื่อของท่านในแบบสอบถาม ข้อมูลที่ท่านให้แก่การศึกษานี้จะได้รับการเก็บไว้เป็นความลับอย่างเคร่งครัดและ ทำสำเนาแก่สำนักงานสนับสนุนการวิจัยแห่งมหาวิทยาลัยสุขภาพ และวิทยาศาสตร์โอเรกอน เพื่อตรวจสอบความ ครบถ้วนและถูกต้องของข้อมูล ในระหว่างที่การศึกษานี้ยังดำเนินการอยู่ แบบสอบถามที่ท่านตอบจะได้รับการเก็บ ไว้ที่สำนักงานของผู้วิจัยอย่างปลอดภัย

ค่าใช้จ่าย:

ท่านไม่ต้องเสียค่าใช้จ่ายใดๆทั้งสิ้นในการเข้าร่วมการศึกษานี้

ความรับผิดชอบในการวิจัย:

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอนอยู่ภายใต้กฎหมายคุ้มครองของรัฐโอเรกอน สหรัฐอเมริกา (ORS 30.260 ถึง 30.300) ถ้าท่านได้รับผลเสียหายจากการศึกษานี้จากบุคลากรของมหาวิทยาลัย ท่านสามารถ ฟ้องร้องทางกฎหมายต่อมหาวิทยาลัยได้ตามข้อกำหนดของกฎหมายดังกล่าว การเซ็นใบยินยอมเข้าร่วมการศึกษา นี้ไม่เป็นการสละสิทธิ์ทางกฎหมายของท่านแต่อย่างใด ถ้าท่านมีข้อสงสัยเพิ่มเติม สามารถติดต่อสำนักงานสนับสนุน การวิจัย แห่ง มหาวิทยาลัยสุขภาพและ วิทยาศาสตร์โอเรกอน ที่หมายเลขโทรศัพท์ 001-503-494-7887

การเข้าร่วมการวิจัย:

หัวหน้าผู้วิจัย นภาพร วาณิชย์กุล (โทร. (02) 419-7466 ต่อ 1759) ยินดีที่จะให้ข้อมูลหรือตอบข้อสงสัยแก่ทุกท่าน เกี่ยวกับการเข้าร่วมการศึกษานี้ ถ้าท่านมีข้อสงสัยเกี่ยวกับสิทธิ์ของท่านในการเข้าร่วม

การศึกษานี้ สามารถสอบถามได้ที่สำนักงานสนับสนุนการวิจัยแห่งมหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์ โอเรกอน (โทร. 001-503- 494-7887) ท่านสามารถปฏิเสธหรือยุติการเข้าร่วมการศึกษาได้โดยที่ไม่มีผลต่อความสัมพันธ์และการรักษา ของท่านที่ โรงพยาบาลโรคทรวงอก ท่านจะได้รับสำเนาใบยินยอมนี้ เพื่อเก็บไว้อ้างอิงด้วย 1 ฉบับ

<u>คำยินยอมของผู้เข้าร่วมการวิจัย</u>:

ท่านได้รับทราบรายละเอียดของโครงการศึกษาตลอดจนประโยชน์ และ ข้อเสี่ยงที่จะเกิดขึ้นต่อท่านจากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้นและยินยอมให้ทำการวิจัยในโครงการที่มีชื่อข้างต้น และท่าน รู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ท่านสามารถสอบถามผู้วิจัยได้

ท่านสามารถไม่เข้าร่วมการศึกษานี้ เมื่อใดก็ได้ โดยไม่มีผลกระทบต่อการ รักษาที่ท่านพึงได้รับ นอกจากนี้ ผู้วิจัยและสำนักงานสนับสนุนการวิจัย แห่ง มหาวิทยาลัย สุขภาพ และ วิทยาศาสตร์ โอเรกอน จะเก็บข้อมูลเฉพาะเกี่ยวกับตัวท่านเป็นความลับและจะเปิดเผยได้ เฉพาะในรูป ที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัวท่านต่อหน่วยงานที่เกี่ยวข้องกระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

ลายเซ็นของท่านด้านล่างนี้รับรองถึงการที่ท่านได้อ่านข้อความดังกล่าวข้างต้นและยินยอมเข้าร่วมการศึกษา

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ลงชื่อผู้เข้าร่วมการวิจัย วันที่

_____ _____

ผู้ขอความยินยอม วันที่

IRB # 7259
Approved: August 30, 2002

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

เอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมวิจัย ระยะที่ 1: การสนทนากลุ่ม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย:

นางนภาพร วาณิชย์กุล, วทบ. (พยาบาล), วท.ม.(สรีรวิทยา) โทร. (02) 419-7466 ต่อ 1759

ผู้ควบคุมวิทยานิพนธ์:

ดร. ลินดา เฟลเวอร์, Ph.D. โทร. (001) 503-494-3723

บุคคลและวิธีการติดต่อเมื่อมีเหตุฉุกเฉินที่เกี่ยวข้องกับการวิจัย

นางนภาพร วาณิชย์กุล ภาควิชาการพยาบาลศัลยศาสตร์ คณะพยาบาลศาสตร์
มหาวิทยาลัยมหิดล โทรศัพท์ (02) 419-7466 ต่อ 1759

แพทย์ผู้ดูแลผู้เข้าร่วมวิจัย: ผู้ช่วยศาสตราจารย์นายแพทย์วิศาล คันธารัตนกุล
ภาควิชาเวชศาสตร์ฟื้นฟู โทรศัพท์ (02) 201-2029

เมื่อมีเหตุฉุกเฉินที่เกี่ยวข้องกับการวิจัย กรุณาโทรติดต่อหัวหน้าโครงการในเวลาราชการหรือฝากข้อความเพื่อติดต่อกลับ

ความเป็นมาของโครงการ

ท่านได้รับเชิญเข้าร่วมในการศึกษานี้เนื่องจากท่านมีโรคหลอดเลือดหัวใจและมีอายุตั้งแต่ 45 ปีขึ้นไป การออกกำลังกายได้รับการยอมรับว่าช่วยป้องกัน โรค หลอดเลือดหัวใจไม่ให้เป็นเพิ่มขึ้น หลายท่านประสบความสำเร็จในการออกกำลังกายได้อย่างสม่ำเสมอ แต่หลายๆ ท่านไม่มีความสนใจในการ ออกกำลังกาย แง่มุมความ คิดเห็นจากผู้ที่มีความแตกต่างในระดับของการออกกำลังกาย จะเป็นแนวทางให้ผู้ให้บริการทางสุขภาพสามารถพัฒนาโครงการการออกกำลังกายที่เหมาะสม เพื่อป้องกันหรือชะลอกระบวนการของโรค ข้อมูลจากการอภิปราย และข้อเสนอแนะของท่าน เกี่ยวกับแบบสอบถามนี้จะมีส่วนช่วยอย่างสำคัญในการพัฒนาแบบสอบถามพฤติกรรมการ ออกกำลังกาย เพื่อใช้ ในการศึกษาต่อไป

วัตถุประสงค์:

วัตถุประสงค์ของการศึกษานี้เพื่อพัฒนาแบบสอบถามเกี่ยวกับการออกกำลังกายและปัจจัยที่มีอิทธิพลต่อการออกกำลังกาย สำหรับผู้ที่มีโรคหลอดเลือดหัวใจชาวไทย

ขั้นตอนวิธีวิจัย:

การเข้าร่วมการศึกษานี้ใช้เวลาประมาณ 2 ชั่วโมง ผู้ป่วยจำนวน 36 ท่าน จะเข้าร่วมในการอภิปรายกลุ่ม หากท่านยินดีเข้าร่วมในการศึกษานี้ เบื้องต้น ท่านจะได้รับข้อคำถาม 1 ข้อ เกี่ยวกับระดับการออกกำลังกายของท่านในปัจจุบัน (คำถามอยู่ที่หน้า 5) ท่านจะใช้เวลาประมาณ 5 นาทีในการตอบ ท่านอาจได้รับเชิญให้ร่วมในการอภิปราย กลุ่มต่อไปขึ้นอยู่กับคำตอบของท่านเบื้องต้น หากท่านไม่ สะดวกในวันที่กำหนดหรือในวันนั้นมีผู้สนใจเข้าร่วม อภิปรายกลุ่มเต็มแล้ว กรุณาแจ้งแก่ผู้วิจัยว่าท่านมีความประสงค์จะได้รับการติดต่อนัดมาอภิปรายกลุ่มในภายหลังหรือไม่

ถ้าท่านเข้าร่วมในการอภิปรายกลุ่ม ผู้วิจัยจะมอบแบบสอบถามแก่ท่าน 1 ชุด เพื่อให้ท่านตอบข้อคำถาม ซึ่งจะถามเกี่ยวกับกิจกรรมของท่านขณะพักผ่อนหย่อนใจ ทัศนคติของท่านเกี่ยวกับการออกกำลังกาย และข้อมูล บางอย่างเกี่ยวกับท่าน

ชุดแบบสอบถามจะไม่ปรากฏชื่อของท่านเพื่อให้ท่านสามารถตอบแบบสอบถามได้อย่างอิสระ ดังนั้นกรุณา อย่าเขียนชื่อของท่านในแบบสอบถาม ข้อคำถามเป็นแบบตัวเลือกหลายข้อ ขอให้ท่านเลือกจำนวนตัวเลขที่ตรงกับ ประสบการณ์หรือความรู้สึกของท่าน เมื่อท่านเสร็จการตอบแบบสอบถาม ผู้วิจัยจะขอให้ท่านอภิปรายกับผู้ตอบแบบ สอบถามท่านอื่นๆ เกี่ยวกับความชัดเจนและความเหมาะสมของคำถามต่างๆ

การตอบแบบสอบถามและการอภิปรายกลุ่มจะใช้เวลาประมาณ 2 ชั่วโมง ท่านจะมีโอกาสตอบแบบสอบถาม และอภิปรายกลุ่มในห้องประชุมเล็กที่เหมาะสม ผู้วิจัยจะอยู่ในห้องประชุมด้วยเพื่อตอบคำถามที่ท่านอาจสงสัยในการ ตอบแบบสอบถามและเพื่อดำเนินการอภิปรายกลุ่ม การอภิปรายกลุ่มจะได้รับการบันทึกเทปเพื่อใช้ในการปรับปรุง แบบสอบถามให้ดียิ่งขึ้น

ความเสี่ยงและความไม่สะดวกที่อาจเกิดขึ้น:

การเข้าร่วมในการศึกษานี้ไม่คาดว่าจะเกิดความเสี่ยงแก่ท่าน อาจเกิดความไม่สะดวกในการใช้เวลาในการ ตอบแบบสอบถามและการอภิปรายกลุ่ม ท่านอาจไม่ตอบคำถามในบางข้อได้ตามที่ท่านเห็นสมควร

ประโยชน์:

ท่านอาจได้รับประโยชน์บ้างจากการเข้าร่วมการศึกษานี้ อย่างน้อยที่สุดข้อมูลใหม่ที่ท่านให้แก่การศึกษานี้ อาจเป็นประโยชน์อย่างยิ่งแก่ผู้ป่วยโรคหลอดเลือดหัวใจในอนาคต ข้อมูลที่ได้จะช่วยนำไปสู่การศึกษาเพื่อการ พัฒนาโครงการการออกกำลังกายในการป้องกันหรือชะลอความรุนแรงของโรคหลอดเลือดหัวใจ

ทางเลือกอื่น:

ท่านอาจตัดสินใจไม่เข้าร่วมการศึกษานี้ การที่ท่านไม่เข้าร่วมการศึกษานี้จะไม่มีผลกระทบต่อความสัมพันธ์ของท่านกับแพทย์และบุคลากรอื่นๆ รวมทั้งไม่มีผลกระทบต่อการดูแลรักษาของท่านแต่อย่างใด

ความลับของข้อมูล:

ชื่อและข้อมูลที่อาจบ่งชี้ถึงตัวท่านจะไม่ถูกเปิดเผยในการตีพิมพ์ผลการศึกษาหรือในที่สาธารณะ จะไม่มีการ บันทึกชื่อของท่านในแบบสอบถาม และไม่เอ่ยชื่อของท่านในการอภิปรายกลุ่ม ข้อมูลที่ท่านให้แก่การศึกษานี้จะได้รับ การเก็บไว้เป็นความลับอย่างเคร่งครัดและทำสำเนาแก่สำนักงานสนับสนุนการวิจัย แห่ง มหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์โอเรกอน เพื่อตรวจสอบความครบถ้วนและถูกต้องของข้อมูล ในระหว่างที่การศึกษานี้ยังดำเนินการอยู่ แบบสอบถามที่ท่านตอบและแถบบันทึกเสียงการอภิปรายจะได้รับการเก็บไว้ที่สำนักงานของผู้วิจัยอย่างปลอดภัย แถบบันทึกเสียงจะถูกทำลายเมื่อการศึกษาสิ้นสุดลง

ค่าใช้จ่าย: ท่านไม่ต้องเสียค่าใช้จ่ายใดๆทั้งสิ้นในการเข้าร่วมการศึกษานี้

ความรับผิดชอบในการวิจัย:

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอนอยู่ภายใต้กฎหมายคุ้มครองของรัฐโอเรกอน สหรัฐอเมริกา (ORS 30.260 ถึง 30.300) ถ้าท่านได้รับผลเสียหายจากการศึกษานี้จากบุคลากรของมหาวิทยาลัย ท่านสามารถ พ้องร้องทางกฎหมายต่อมหาวิทยาลัยได้ตามข้อกำหนดของกฎหมายดังกล่าว การเซ็นใบยินยอม เข้าร่วมการศึกษานี้ ไม่เป็นการสละสิทธิ์ทางกฎหมายของท่านแต่อย่างใด ถ้าท่านมีข้อสงสัยเพิ่มเติม สามารถติดต่อสำนักงาน สนับสนุนการวิจัย แห่งมหาวิทยาลัยสุขภาพและวิทยาศาสตร์ โอเรกอน ที่หมายเลขโทรศัพท์ 001-503-494-7887

การเข้าร่วมการวิจัย:

หัวหน้าผู้วิจัย นภาพร วาณิชย์กุล (โทร. 02-419-7466 ต่อ 1759) ยินดีที่จะให้ข้อมูลหรือตอบข้อสงสัยแก่ทุกท่าน เกี่ยวกับการเข้าร่วมการศึกษานี้ ถ้าท่านมีข้อสงสัยเกี่ยวกับสิทธิ์ของท่านในการเข้าร่วมการศึกษาสามารถ สอบถามได้ที่ สำนักงานสนับสนุนการวิจัย แห่งมหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน โทร. 001-503-494-7887 ท่านสามารถปฏิเสธหรือยุติการเข้าร่วมการวิจัยได้โดยที่ไม่มีผลต่อการได้รับบริการและการรักษาของท่านที่โรงพยาบาลรามาธิบดีแต่ประการใด ท่านจะได้รับสำเนาใบยินยอมนี้เพื่อเก็บไว้อ้างอิง ด้วย 1 ฉบับ

ถ้าท่านมีปัญหาข้องใจหรือรู้สึกกังวลใจกับการเข้าร่วมในโครงการวิจัยนี้ ท่านสามารถติดต่อกับ ประธานกรรมการจริยธรรมการวิจัยในคณะแพทยศาสตร์โรงพยาบาลรามาธิบดี โทร. 0-2201-1541 ในเวลาราชการ

IRB # 7259

Approved: August 30, 2002

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจสำหรับการศึกษาระยะที่ 1: การสนทนากลุ่ม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย: นางนภาพร วาณิชย์กุล, วท.บ.(พยาบาล), วท.ม.(สรีรวิทยา)

โทร. (02) 419-7466 ต่อ1759

ชื่อผู้เข้าร่วมการวิจัย: นาย/นาง/นางสาว _____

คำยินยอมของผู้เข้าร่วมการวิจัย:

ข้าพเจ้าได้รับทราบรายละเอียดของโครงการศึกษาตลอดจนประโยชน์ และ ข้อเสี่ยงที่จะเกิดขึ้นต่อ ข้าพเจ้าจากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้นและยินยอมให้ทำการวิจัยในโครงการที่มีชื่อ ข้างต้น และข้าพเจ้ารู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ข้าพเจ้าสามารถสอบถามสอบถามผู้วิจัยได้ ข้าพเจ้ายินดีเข้าร่วมการศึกษาทั้งการตอบแบบสอบถามและการเข้าร่วมกลุ่มสนทนา ข้าพเจ้าสามารถไม่เข้า ร่วมการศึกษานี้เมื่อใดก็ได้ โดยไม่มีผลกระทบต่อการรักษาที่ข้าพเจ้าพึงได้รับ นอกจากนี้ ผู้วิจัยและสำนักงาน สนับสนุนการวิจัย แห่ง มหาวิทยาลัยสุขภาพ และวิทยาศาสตร์ โอเรกอน จะเก็บข้อมูลเฉพาะเกี่ยวกับตัว ข้าพเจ้าเป็นความลับและจะเปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัย การเปิดเผยข้อมูลเกี่ยวกับตัว ข้าพเจ้าต่อหน่วยงาน
ที่เกี่ยวข้องกระทำได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

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ลงชื่อผู้เข้าร่วมการวิจัย วันที่

_____ _____

พยาน พยาน

คำอธิบายของผู้วิจัย

ข้าพเจ้าได้อธิบายรายละเอียดของโครงการ ตลอดจนประโยชน์ของการวิจัย รวมทั้งข้อเสี่ยงที่อาจเกิดขึ้นแก่ ผู้เข้าร่วมการวิจัยทราบแล้วอย่างชัดเจนโดยไม่มีสิ่งใดปิดบังซ้อนเร้น

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ผู้ขอความยินยอม วันที่

กรุณาเปิดไปหน้าถัดไปแล้วตอบคำถามว่า ระยะการออกกำลังกายของท่านอยู่ในระดับใด **ขอขอบคุณอย่างยิ่ง**

ขั้นตอนการเปลี่ยนแปลงพฤติกรรมการออกกำลังกาย

ข้อความทั้ง 5 ต่อไปนี้จะประเมินว่า ในปัจจุบันนี้ท่านใช้เวลาว่างในการออกกำลังกายมากน้อยเพียงใด (การออกกำลังกายนอกเหนือจากงานประจำ)

การออกกำลังกาย เป็นกิจกรรมที่มีการเคลื่อนไหวของร่างกายที่ได้ถูกวางแผนกำหนดไว้เพื่อเพิ่มความแข็งแรงของร่างกาย เช่น การเดินเร็ว การวิ่งเหยาะๆ การปั่นจักรยาน การว่ายน้ำ การเต้นรำ หรือกิจกรรมอื่นๆที่มีลักษณะคล้ายกัน

การออกกำลังกายสม่ำเสมอ หมายถึง **<u>การออกกำลังกายสะสมในแต่ละวัน เป็นเวลาอย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์</u>** ในระดับที่ทำให้ **การหายใจเร็วขึ้นและมีเหงื่อออก**

ตัวอย่างเช่น ในวันหนึ่งท่านเดินเร็วนาน 30 นาที 1 ครั้ง หรือเดินเร็วครั้งละ 10 นาที 3 ครั้ง ถ้าท่านปฏิบัติอย่างน้อยในระดับนี้ในเกือบทุกวันของสัปดาห์ ที่ทำให้การหายใจเร็วขึ้นและมีเหงื่อออก หมายความว่าท่านออกกำลังกายอย่างสม่ำเสมอ

ท่าน**ออกกำลังกายสม่ำเสมอ** (สะสมในแต่ละวันเป็นเวลา อย่างน้อย 30 นาที เกือบทุกวัน ในแต่ละสัปดาห์) ตามคำจำกัดความข้างต้นหรือไม่?

กรุณาเลือกตอบ**เพียงข้อเดียว**จาก 5 ตัวเลือกต่อไปนี้

- ❑ 1. ไม่, และฉัน**ไม่มีความตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอภายใน 6 เดือนข้างหน้า
- ❑ 2. ไม่, แต่ฉัน**ตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในอีก 6 เดือนข้างหน้า**
- ❑ 3. ไม่, แต่ฉัน**ตั้งใจ**ที่จะเริ่มออกกำลังกายอย่างสม่ำเสมอ**ในระยะ 30 วันข้างหน้า**
- ❑ 4. ใช่, ฉัน**ออกกำลังกายอย่างสม่ำเสมอ**มาแล้วแต่ **น้อยกว่า 6 เดือน**
- ❑ 5. ใช่, ฉัน**ออกกำลังกายอย่างสม่ำเสมอ**มาแล้วเป็น**เวลานานกว่า 6 เดือน**

กรุณาคืนแบบสอบถามนี้แก่ผู้วิจัย ขอขอบคุณ

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มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

เอกสารชี้แจงข้อมูล/คำแนะนำแก่ผู้เข้าร่วมวิจัย ระยะที่ 2: แบบสอบถาม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย:

นางนภาพร วาณิชย์กุล, วท.บ. (พยาบาล), วท.ม.(สรีรวิทยา) โทร. (02) 419-7466 ต่อ1759

ผู้ควบคุมวิทยานิพนธ์: ดร. ลินดา เฟลเวอร์, Ph.D. โทร. (001) 503-494-3723

บุคคลและวิธีการติดต่อเมื่อมีเหตุฉุกเฉินที่เกี่ยวข้องกับการวิจัย

นางนภาพร วาณิชย์กุล ภาควิชาการพยาบาลศัลยศาสตร์ คณะพยาบาลศาสตร์
มหาวิทยาลัยมหิดล โทรศัพท์ (02) 419-7466 ต่อ 1759

แพทย์ผู้ดูแลผู้เข้าร่วมวิจัย: ผู้ช่วยศาสตราจารย์นายแพทย์วิศาล คันธารัตนกุล
ภาควิชาเวชศาสตร์ฟื้นฟู โทรศัพท์ (02) 201-2029

เมื่อมีเหตุฉุกเฉินที่เกี่ยวข้องกับการวิจัย กรุณาโทรติดต่อหัวหน้าโครงการ ในเวลาราชการ หรือฝากข้อความเพื่อติดต่อกลับ

ความเป็นมาของโครงการ:

ท่านได้รับเชิญเข้าร่วมในการศึกษานี้เนื่องจากท่านมีโรคหลอดเลือดหัวใจและมีอายุตั้งแต่ 45 ปีขึ้นไป การออกกำลังกายได้รับการยอมรับว่าช่วยป้องกันโรคหลอดเลือดหัวใจไม่ให้เป็นเพิ่มขึ้น หลายท่านประสบความสำเร็จในการออกกำลังกายได้อย่างสม่ำเสมอ แต่หลายๆท่านไม่มีความสนใจในการออกกำลังกาย แง่มุมความ คิดเห็นจากผู้ที่มีความแตกต่างในระดับของการ ออกกำลังกายจะเป็นแนวทางให้ผู้ให้บริการทางสุขภาพสามารถ พัฒนาโครงการการออกกำลังกายที่เหมาะสม เพื่อป้องกันหรือชลอกระบวนการของโรค

วัตถุประสงค์:

วัตถุประสงค์ของการศึกษานี้เพื่อพัฒนาแบบสอบถามเกี่ยวกับการออกกำลังกายและปัจจัยที่มีอิทธิพลต่อ การออกกำลังกาย สำหรับผู้ที่มีโรคหลอดเลือดหัวใจชาวไทย ข้อมูลจากการตอบแบบสอบถามของท่านจะมีส่วนช่วย อย่างสำคัญในการพัฒนาแบบสอบถามพฤติกรรมการออกกำลังกายเพื่อใช้ ในการศึกษาต่อไป

ขั้นตอนวิธีวิจัย:

การเข้าร่วมการศึกษานี้ใช้เวลาประมาณ 45-50 นาที คาดว่าจะมีผู้เข้าร่วมตอบแบบสอบถามในการศึกษานี้ ประมาณ 450-500 ท่าน หากท่านยินดีเข้าร่วมในการศึกษานี้ ผู้วิจัยจะมอบแบบสอบถามแก่ท่าน 1 ชุดเพื่อให้ท่าน ตอบข้อคำถาม ซึ่งจะถามเกี่ยวกับกิจกรรมของท่านขณะพักผ่อนหย่อนใจ ทัศนคติของท่านเกี่ยวกับการออกกำลังกาย และข้อมูลบางอย่างเกี่ยวกับท่าน

ชุดแบบสอบถามจะไม่ปรากฏชื่อของท่านเพื่อให้ท่านสามารถตอบแบบสอบถามได้อย่างอิสระ ดังนั้นกรุณา อย่าเขียนชื่อของท่านในแบบสอบถาม ข้อคำถามเป็นแบบตัวเลือกหลายข้อ ขอให้ท่านเลือกตัวเลขที่ตรงกับ ประสบการณ์หรือความรู้สึกของท่าน ผู้วิจัยจะมอบแบบสอบถามชุดนี้หลังจากที่ท่านลงชื่อในใบยินยอมเข้าร่วมการ ศึกษาฉบับนี้แล้ว ผู้วิจัยจะอยู่ด้วยในขณะที่ท่านตอบแบบสอบถาม และพร้อมที่จะตอบข้อสงสัยในการตอบแบบสอบถาม

ความเสี่ยงและความไม่สะดวกที่อาจเกิดขึ้น:

การเข้าร่วมในการศึกษานี้ไม่เกิดความเสี่ยงแก่ท่าน อาจเกิดความไม่สะดวกในการใช้เวลาในการตอบแบบสอบถาม ท่านมีสิทธิที่จะไม่ตอบคำถามในบางข้อได้ตามที่ท่านเห็นสมควร

ประโยชน์:

ท่านอาจได้รับประโยชน์บ้างจากการเข้าร่วมการศึกษานี้ อย่างน้อยที่สุดข้อมูลใหม่ที่ท่านให้แก่การศึกษานี้ อาจเป็นประโยชน์อย่างยิ่งแก่ผู้ป่วยในอนาคต ข้อมูลที่ได้จะช่วยนำไปสู่การศึกษาเพื่อการพัฒนาโครงการการออกกำลังกาย เพื่อป้องกันหรือชะลอความรุนแรงโรคหลอดเลือดหัวใจ

ทางเลือกอื่น:

ท่านอาจตัดสินใจไม่เข้าร่วมการศึกษานี้ การที่ท่านไม่เข้าร่วมการศึกษานี้จะไม่มีผลกระทบต่อความสัมพันธ์ของท่านกับแพทย์และบุคลากรอื่นๆ รวมทั้งไม่มีผลกระทบต่อการดูแลรักษาของท่านแต่อย่างใด

ความลับของข้อมูล:

ชื่อและข้อมูลที่อาจบ่งชี้ถึงตัวท่านจะไม่ถูกเปิดเผยในการตีพิมพ์ผลการศึกษาหรือในที่สาธารณะ จะไม่มีการ บันทึกชื่อของท่านในแบบสอบถาม ข้อมูลที่ท่านให้แก่การศึกษานี้จะได้รับการเก็บไว้เป็นความลับอย่างเคร่งครัดและ ทำสำเนาแก่สำนักงานสนับสนุนการวิจัยแห่งมหาวิทยาลัยสุขภาพ และวิทยาศาสตร์โอเรกอน เพื่อตรวจสอบความ ครบถ้วนและถูกต้องของข้อมูล ในระหว่างที่การศึกษานี้ยังดำเนินการอยู่ แบบสอบถามที่ท่านตอบจะได้รับการเก็บ ไว้ที่สำนักงานของผู้วิจัยอย่างปลอดภัย

ค่าใช้จ่าย:

ท่านไม่ต้องเสียค่าใช้จ่ายใดๆทั้งสิ้นในการเข้าร่วมการศึกษานี้

ความรับผิดชอบในการวิจัย:

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอนอยู่ภายใต้กฎหมายคุ้มครองของรัฐโอเรกอน สหรัฐอเมริกา (ORS 30.260 ถึง 30.300) ถ้าท่านได้รับผลเสียหายจากการศึกษานี้จากบุคลากรของมหาวิทยาลัย ท่านสามารถ ฟ้องร้องทางกฎหมายต่อมหาวิทยาลัยได้ตามข้อกำหนดของกฎหมายดังกล่าว การเซ็นใบยินยอมเข้าร่วมการศึกษา นี้ไม่เป็นการสละสิทธิ์ทางกฎหมายของท่านแต่อย่างใด ถ้าท่านมีข้อสงสัยเพิ่มเติม สามารถติดต่อสำนักงานสนับสนุน การวิจัย แห่ง มหาวิทยาลัยสุขภาพและวิทยาศาสตร์ โอเรกอน ที่หมายเลขโทรศัพท์ 001-503-494-7887

การเข้าร่วมการวิจัย:

หัวหน้าผู้วิจัย นภาพร วาณิชย์กุล (โทร. (02) 419-7466 ต่อ 1759) ยินดีที่จะให้ข้อมูลหรือตอบข้อสงสัยแก่ทุกท่าน เกี่ยวกับการเข้าร่วมการศึกษานี้ ถ้าท่านมีข้อสงสัยเกี่ยวกับสิทธิ์ของท่านในการเข้าร่วมการศึกษานี้ สามารถสอบถามได้ที่สำนักงานสนับสนุนการวิจัยแห่งมหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์ โอเรกอน (โทร. 001-503- 494-7887) ท่านสามารถปฏิเสธหรือยุติการเข้าร่วมการศึกษาได้โดยที่ไม่มีผลต่อความสัมพันธ์และการรักษา ของท่านที่ โรงพยาบาลรามาธิบดี ท่านจะได้รับสำเนาใบยินยอมนี้เพื่อเก็บไว้อ้างอิงด้วย 1 ฉบับ

ถ้าท่านมีปัญหาข้องใจหรือรู้สึกกังวลใจกับการเข้าร่วมในโครงการวิจัยนี้ ท่านสามารถติดต่อกับ ประธานกรรมการจริยธรรมการวิจัยในคน คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี โทร. 0-2201-1541 ในเวลาราชการ

IRB # 7259
Approved: August 30, 2002

มหาวิทยาลัยสุขภาพและวิทยาศาสตร์โอเรกอน

หนังสือยินยอมโดยได้รับการบอกกล่าวและเต็มใจสำหรับการศึกษาระยะที่ 2: แบบสอบถาม

ชื่อโครงการวิจัย:

การศึกษาความเที่ยงตรงของแบบสอบถามการวิจัยการออกกำลังกายของผู้ป่วยไทยโรคหลอดเลือดหัวใจวัยกลางคนถึงวัยสูงอายุ

ชื่อหัวหน้าโครงการวิจัย: นางนภาพร วาณิชย์กุล, วท.บ.(พยาบาล), วท.ม.(สรีรวิทยา) โทร.(02) 419-7466 ต่อ1759

ชื่อผู้เข้าร่วมการวิจัย: นาย/นาง/นางสาว_____

คำยินยอมของผู้เข้าร่วมการวิจัย:

ข้าพเจ้าได้รับทราบรายละเอียดของโครงการศึกษาตลอดจนประโยชน์ และข้อเสี่ยงที่จะเกิดขึ้นต่อข้าพเจ้า จากผู้วิจัยแล้วอย่างชัดเจน ไม่มีสิ่งใดปิดบังซ่อนเร้นและยินยอมให้ทำการวิจัยในโครงการที่มีชื่อข้างต้น และข้าพเจ้า รู้ว่าถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้น ข้าพเจ้าสามารถสอบถามผู้วิจัยได้ ข้าพเจ้าสามารถไม่เข้าร่วมการศึกษานี้เมื่อใด ก็ได้ โดยไม่มีผลกระทบต่อการ รักษาที่ข้าพเจ้าพึงได้รับ นอกจากนี้ผู้วิจัยและสำนักงานสนับสนุนการวิจัย แห่ง มหาวิทยาลัยสุขภาพ และ วิทยาศาสตร์ โอเรกอน จะเก็บข้อมูลเฉพาะเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะ เปิดเผยได้เฉพาะในรูปที่เป็นสรุปผลการวิจัยการเปิดเผยข้อมูล เกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานที่เกี่ยวข้องกระทำ ได้เฉพาะกรณีจำเป็นด้วยเหตุผลทางวิชาการเท่านั้น

_____ _____

ลงชื่อผู้เข้าร่วมการวิจัย วันที่

_____ _____

พยาน พยาน

คำอธิบายของผู้วิจัย

ข้าพเจ้าได้อธิบายรายละเอียดของโครงการ ตลอดจนประโยชน์ของการวิจัย รวมทั้งข้อเสี่ยงที่อาจเกิดขึ้นแก่ ผู้เข้าร่วมการวิจัยทราบแล้วอย่างชัดเจนโดยไม่มีสิ่งใดปิดบังซ่อนเร้น

_____ _____

ผู้ขอความยินยอม วันที่

APPENDIX F

SCREENING PARTICIPANT SHEET

เครื่องมือการคัดเลือกผู้เข้าร่วมการวิจัย

วันที่_____ **โรงพยาบาล** _____

เกณฑ์การคัดเลือกผู้ป่วย

- ❑ อายุตั้งแต่ 45 ปีขึ้นไป เกิดวันที่ _____
- ❑ ได้รับการวินิจฉัยเป็นโรคหลอดเลือดหัวใจและมีความสามารถในการปฏิบัติกิจกรรมต่างๆ ในระดับ 1 คือ ในขณะปฏิบัติกิจกรรมทางกายตามปกติ ไม่เคยมีอาการดังต่อไปนี้: เหนื่อยเพลียเร็วกว่าปกติ, ใจสั่น, เหนื่อยหอบ, หรือ เจ็บหน้าอก
- ❑ เดินและช่วยเหลือตนเองได้โดยไม่ต้องใช้อุปกรณ์ช่วย
- ❑ สามารถอ่านและเขียนตอบแบบสอบถามได้

เกณฑ์การคัดผู้ป่วยออกจากการศึกษา

- ❑ การผ่าตัดใหญ่ เช่น ผ่าตัดหัวใจ ปอด สมอง หลอดเลือด ช่องท้อง กระดูก ภายใน 6 เดือนที่ ผ่านมา
- ❑ ตาบอด หรือหูหนวก
- ❑ อัมพฤกษ์หรืออัมพาตภายใน 1 ปีที่ผ่านมา
- ❑ ได้รับการวินิจฉัยและกำลังได้รับการรักษาโรคมะเร็งอยู่
- ❑ โรคปอดอุดกั้นเรื้อรัง
- ❑ โรคไตที่ต้องได้รับการรักษาด้วยการฟอกเลือดหรือล้างท้อง
- ❑ ความผิดปกติของสมองเช่น สมองเสื่อม , สับสน, โรคทางจิตประสาท
- ❑ ได้รับการรักษาด้วยเครื่องกระตุ้นการทำงานของหัวใจ หรือต้องได้รับออกซิเจนตลอดเวลา
- ❑ โรคอื่นๆที่เป็นอุปสรรคต่อการออกกำลังกายเช่น โรคข้ออักเสบรุนแรง

<u>การแนะนำการวิจัยครั้งนี้ต่อผู้ป่วยสำหรับพยาบาลประจำตึกผู้ป่วยนอก</u>

สวัสดีค่ะ ขณะนี้มีพยาบาลที่ต้องการทราบความคิดเห็นของคุณเกี่ยวกับการออกกำลังกาย และสิ่งต่างๆที่มีผล ทำให้คุณตัดสินใจที่จะออกหรือไม่ออกกำลังกาย คุณยินดีจะให้ข้อมูลนี้ระหว่าง รอตรวจวันนี้ ได้หรือไม่ค่ะ (ถ้าผู้ป่วยยินดีให้ข้อมูลโปรดกรุณาให้ดูป้องส่วนที่หนึ่งแก่ผู้ป่วย)

❑ ยินดี ❑ ไม่ยินดี

ช่องนี้สำหรับผู้วิจัย

ถ้าผู้เข้าร่วมการวิจัยเข้าตามเกณฑ์ข้างต้น และได้เซ็นต์ใบยินยอมเข้าร่วมการวิจัย

หมายเลขผู้เข้าร่วมวิจัย.....

Potential Participant Screening Tool

Screening Date ..... **Hospital Name** .....

Inclusion Criteria:

- ❑ Age 45 years and older. Date of Birth .....
- ❑ Having a diagnosis of coronary artery disease with functional class I. Patient does not have undue fatigue, palpitation, dyspnea, or angina pain from doing ordinary physical activity.
- ❑ Ambulatory without assistance of cane or other device.
- ❑ Able to read and write on questionnaires.

Exclusion Criteria:

- ❑ Major surgery including heart, lung, brain, vascular, abdominal, and orthopedic within the past 6 months.
- ❑ Blindness or deafness.
- ❑ Stroke within past year.
- ❑ Cancer diagnosis and still on a treatment course.
- ❑ Chronic obstructive pulmonary disease
- ❑ Kidney disease requiring hemodialysis or peritoneal dialysis.
- ❑ Altered thought such as dementia, confusion, psychosis.
- ❑ On advanced treatment such as pacemaker or continuous oxygen therapy.
- ❑ Other diseases that limit performing exercise, such as severe arthritis.

Script for Clinic Nurse:

Hello, today we have a nurse who is a doctoral student and would like to get your opinion about exercise. Her study's purpose is to validate questionnaires related to factors influencing exercise among persons who have heart vascular disease. Would you be willing to talk to her so she can tell you more about the study? (If the potential participant answers "yes", please introduce her/him to the researcher.)

❑ Yes ❑ No

For researcher's use:
If participant meets criteria and gives consent to participate, subject number is .....