



CHAPTER II

LITERATURE REVIEW

Research literature pertaining to the quality of life (QOL) in patients with post myocardial infarction (MI) and developing the measure of the quality of life in Thai patients with post MI, by cross cultural research, will be critiqued and reviewed. The literature is organized into five sections

The first section focuses on myocardial infarction and the effect on the patient's life. The second section is a definition of the quality of life and the quality of life in patients with post myocardial infarction. The third section is the measurement and the instruments used to measure the quality of life. The fourth section is the development of the quality of life instrument. The fifth section is the psychometric testing of the instrument.

The first section

Myocardial infarction

Myocardial infarction or acute myocardial infarction (MI or AMI), commonly known as a heart attack, is a serious, sudden heart condition usually characterized by varying degrees of chest pain or discomfort, weakness, sweating, nausea, vomiting, and arrhythmias, sometimes causing loss of consciousness (Wikipedia Encyclopedia, 2006). It occurs when blood supply to a part of the heart is interrupted, causing death and scarring of the local heart tissue. The severity of MI varies from chest pains to life-threatening causes. It needs a medical emergency, which demands both immediate attention and activation of emergency medical services.

MI is elevated from the ST segment and changes in the T wave. After a myocardial infarction, changes can often be seen on the electrocardiogram (ECG)

called Q wave, representing scarred heart tissue. The ST segment elevation distinguishes between: STEMI (ST-Elevation Myocardial Infarction) and NSREMI (Non –ST-Elevation Myocardial Infarction) – diagnosed when cardiac enzymes are elevated.

Canadian Cardiovascular Society Functional Classification of Angina Pectoris separated patients with angina symptoms into groups based on the severity of their symptoms. The classification used the extent of limitation on daily activities and the kind of activity which precipitates the angina episode. The comparative reproducibility and validity of systems for assessing cardiovascular functional class: advantages of a new specific activity scale are:

Class 1 Ordinary physical activity, (e.g. walking and climbing stairs) does not cause angina; angina occurs with strenuous, rapid, or prolonged exertion at work or recreation.

Specific activity scale: ability to ski, play basketball, go for a light jog (5 mph), or shovel snow without angina.

Class 2 Slight limitation on ordinary activity; angina occurs on walking or climbing up stairs rapidly; walking uphill; walking or stair climbing after meals, in cold, in wind, or under emotional stress; or only during the few hours after awakening; when walking 2 blocks on level ground; or when climbing more than 1 flight of stairs at a normal pace and in normal conditions.

Specific activity scale: ability to garden, rake, roller skate, walk at 4 mph on level ground, and have sexual intercourse without stopping

Class 3 Marked limitation of ordinary physical activity; angina occurs on walking 1 to 2 blocks on level ground or climbing 1 flight of stairs at a normal pace in normal conditions.

Specific activity scale: Ability to shower or dress without stopping, walk 2.5 mph, bowl, make a bed, and play golf

Class 4 Inability to perform any physical activity without discomfort; angina symptoms may be present at rest.

Specific activity scale: Inability to perform activities requiring 2 or fewer metabolic equivalents (METs) without signs of heart attack include: chest discomfort or uncomfortable pressure, fullness, squeezing, or pain in the center of the chest that lasts longer than a few minutes, or comes and goes, spreading pain to one or both arms, back, jaw, or stomach. Cold sweats and nausea. As with men, women's most common heart attack symptoms are chest pains or discomfort. But women are somewhat more likely than men to have some of the other warning signs, particularly shortness of breath, nausea, vomiting and back or jaw pain.

The longer patients wait to get medical treatment, the greater the likelihood that they will have severe, permanent damage to their heart or even die. The earlier the treatment, the more likely it is that damage to their heart will be kept to a minimum. Remember that treatments are most effective if given within one hour of when the attack begins.

The treatment:

Modern treatments for CAD with post MI focus not only on improving life expectancy, but also on symptoms, functions, and the quality of life. Thus, an improvement in health related quality of life is increasingly being cited as a primary outcome in the clinical decision-making process and in the determination of therapeutic benefit

Lifestyle Modification:

Patients with documented CAD should actively pursue lifestyle modifications that reduce the risk of future cardiovascular events.

Smoking

Tobacco use is one of the most important contributors to recurrent cardiovascular events. Smoking cessation is imperative, and it is more likely to be successful for those patients who are counseled by a physician or who enroll in a formal smoking cessation program.

Exercise

Functional capacity is a strong predictor of major adverse cardiac events (Snader, et al. 1998). Functional capacity can be improved by following an exercise program that entails at least 30 minutes of exercise 3 or 4 days per week; a daily regimen is optimal. Moderate- and high-risk patients should be enrolled in a medically supervised exercise program.

Weight Control

The best weight management strategy is diet and exercise. Ideal benchmarks are a body mass index between 18.5 kg/m^2 and 24.9 kg/m^2 and a waist circumference of no more than 40 inches for men and 35 inches for women. Weight loss has a favorable impact on many cardiac risk factors, including hypertension, a high LDL level, a low HDL level, and glucose intolerance.

Drug Therapy:

1.1 Pharmacologic therapy should be a part of the treatment plan for every patient with documented CAD. Antiplatelet therapy should be prescribed for every patient, and an anti-angina agent should be given to those who need it. Unless they are contraindicated, an angiotensin-converting enzyme (ACE) inhibitor and a

beta blocker are recommended for all patients who have a history of MI and drugs used to dissolve blood clots (thrombolysis).

Intervention:

1.2 Balloon angioplasty or percutaneous transluminal coronary angioplasty (PTCA) to widen narrowed arteries with an inflated balloon.

Surgery:

Coronary artery bypass graft surgery (CABG) to improve blood supply to parts of the heart muscle that suffers from decreased blood flow.

Rehabilitation:

Cardiac rehabilitation programs are offered in most communities to help people recover from a heart attack and reduce the chances of having another attack.

In conclusion, myocardial infarction was a life threatening disease and disturbed patients' lives, for instance: life threatening with symptoms and complication, chronic disease, decrease in physical ability, modifications and limitations in lifestyle of living, etc. All of them affected the patients' quality of life.

The second section

Definition of quality of life

Quality of life has no universal definition but it is a broad, multidimensional, subjective, and temporal phenomenon so the quality of life has many definitions depending on different models. A broad definition of quality of life includes duration of life, impairment, functional status (social, psychological, and physical), health perceptions, and opportunity. Other definitions focus on the perception of well-being,

satisfaction with one's life, achievement of personal goals, social usefulness, or normalcy, for instance:

WorldNet Dictionary, 2000: Quality of life is a personal satisfaction (or dissatisfaction) with the cultural or intellectual conditions under which you live (as distinct from material comfort); "the new art museum is expected to improve the quality of life".

Medical Dictionary, 2000: Quality of life is the overall enjoyment of life. Many clinical trials measure aspects of an individual's sense of well-being and ability to perform various tasks to assess the effects of cancer and its treatment on the quality of life.

Biology Dictionary, 2000: Quality of life is a reference to the well-being of a patient, a concept often applied when an assessment of an elderly patient is made. There are three major components of the quality of life: 1.) health: diseases and body functions, 2.) socioeconomic status, 3.) functional status: physical, social, mental and sexual behavior, daily activities, achievements, and disabilities.

WHO defines Quality of life as an individual's perception of their positions in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (WHO, 1993). The definition includes six broad domains: physical health, psychological state, level of independence, social relationships, environmental features, and spiritual concerns.

Ferrans & Powers (1984) defined Quality of life as a perception of a person's sense of well being that stems from satisfaction or dissatisfaction with the area of life that is important to him / her and categorized quality of life into 4 major domains, namely health and functioning , psychological / spiritual , socioeconomic and the family domain . Factors which impact on quality of life are education,

race, age, marital status, family patterns, employment, income, disease and course of treatment (Evan . et al 1990 cited in Ferrans & Power 1993). Quality of life is dynamic and can change through an individual's perception, which vary accordingly to their experiences from time to time (Dow 990 cited in Ferrans, et al 1995).

Padilla and Grant (1985) state that Quality of life refers to that which makes life worth living and connotes the caring aspects of nursing, because nursing is concerned not only with survival and decreased morbidity, but with the whole patient.

Oleson (1990) defined Quality of life as the individual's perception of important life domains and satisfaction with those domains including both objective and subjective indicators of physical and psychological phenomena.

Daumer & Miller (1992) defined Quality of life as the individual's evaluation of well-being that incorporates aspects of life satisfaction/ dissatisfaction and happiness/unhappiness.

Zhan (1992) defined Quality of life as the degree to which a person's life experiences are satisfying, a multi-dimensional concept that cannot be completely measured by either a subjective or an objective approach. It has four dimensions of quality of life: life satisfaction, self concept, health and functioning, and socioeconomic factors.

Leininger (1994) proposed that Quality of life was a culturally constituted holistic phenomenon which provided a broad but specific way to know and understand human conditions and expression. The meaning, expression, and symbolic referents of the quality of life tend to vary worldwide due to differences among cultures. Quality of life as a culturally constructed phenomenon is largely abstract, concerning values, beliefs, symbols and patterned expression of particular cultures.

Berzon (1998 cited in Sneed, 2001:332) suggests that for the purposes of clinical research, "health-related" quality of life is a more specific and appropriate term because it can be considered synonymous with subjective health status and with those aspects of a person's experience affected by health or illness and by health care interventions.

Holzemer & Henry (1999) proposed Quality of life as a general measure of happiness or satisfaction with life.

Fletcher et al, (1987); Deyo, (1991); and Coons & Kaplan, (1992) defined Quality of life as a highly individual experience which is affected by a multitude of personal influences, including cultural and political values, spiritual beliefs, education and environment.

Walker & Rosser, (1993) defined Quality of life as a concept encompassing a broad range of physical and psychological characteristics and limitations which describe an individual ability to function and to derive satisfaction from doing so. Health status refers to the actual functional levels of health within the three areas that can be articulated as a measure of an individual's function in terms of physical, social, and mental well-being.

In conclusion, quality of life is an individual perception of life experience, satisfaction (or dissatisfaction) or happiness with life with the cultural or intellectual conditions under which you live, both objective (externally observable and directly measurable along a physical dimension) and subjective (can be measured with validity and reliable measurement); of multidimensional domains as: physical and functional, psychological and spiritual, socioeconomics and family; as life worth living not only for survival and a decrease in morbidity, but also for the whole person.

Definition of health related quality of life

Health related quality of life (HRQL) has evolved to encompass the aspects of QOL that can be clearly shown to affect health-either physical or mental (McHorney, 1999), or the value assigned to the duration of life as modified by impairments, functional states, perceptions, and social opportunities as influenced by disease, injury, treatment, or policy (U.S. Department of Health and Human Services, 1990).

Timothy & Peterson (2004) stated that health related quality of life is a subset of quality of life representing feelings, attitudes, or the ability to experience satisfaction in an area of life identified as personally important that has been disrupted by disease processes or health related defects. Most of the time, health related quality of life is used as being synonymous with quality of life but it emphasizes health related to a patient’s life.

Health related Quality of life relates to the level of satisfaction that a person derives from life as a “feel good factor” of their health status and their subsequent ability to manage everyday life.

Health related quality of life definitions usually refer to physical, emotional and social well-being. HRQL is a distinct construct which refers to the impact that health conditions and their symptoms have on an individual's quality of life, and, in the context of healthcare, the term HRQL is preferred over quality of life because the focus is on health. It provides a common benchmark against which can be measured the impact of different experiences and treatments for the same condition or the impact of different treatments across different conditions (Thompson, & Roebuck, 2001). In patients with myocardial infarction, the conditions of disease are related to the effect on the patients’ quality of life.

The definitions of quality of life used in Thai research are quite numerous but for use in heart disease or coronary disease or myocardial infarction are presented in Table1.

Table1. The quality of life definitions in Thai research

Year	Author	Title	Theoretical Definition	Operational Definition
1987	R.Prapa	Factors impact on QOL of MI patients	The result of interaction between human and environment by using cognitive framework of Lazarus. Measured by life satisfaction in general , specific, and overall QOL.	sense of well-being which is the total sum of internal human response assessed by Burckhardt's QOL instrument composed of 1. Wood's Life satisfaction Index (LSI-Z derived from Neugarten) 2. Domain satisfaction Rating Scale developed from Flanagan's life satisfaction scale 3. Overall Quality of life Rating
1990	J. Chutwalai	Relationship between social support, self care behavior and QOL in CHF patients	QOL is the sense of well-being including good life in every domain. It is the same meaning as life satisfaction which is the total sum of internal feeling in a person.	sense of well-being which is the total sum of internal human response assessed by Burckhardt's QOL instrument composed of 1. Wood's Life satisfaction Index (LSI-Z derived from Neugarten) 2. Domain satisfaction Rating Scale developed from Flanagan's life satisfaction scale 3. Overall Quality of life Rating
1996	K.Kusuma	QOL after CABG	QOL is the satisfaction of life and ones surrounding environment, and the happiness from ones satisfaction or dissatisfaction in different important aspects of ones life. The aspects are : satisfaction in family, marital status, sexual relationship, feelings of other people to oneself, social life, hobbies, work, finances, friends, decreasing of symptoms and physical functions.	QOL means life satisfaction and physical functions. Life satisfaction means feeling of satisfaction or dissatisfaction in different aspects of ones life. Assessing by Ferran&Powers QOL Questionnaire divided into four domains: health and function, socioeconomic, psycho-spirituality, and family. Physical function means levels of physical functional ability : exercise, walking, house work, hobbies, including chest pain, dyspnea. Assessing

Table1. (Continue)

Year	Author	Title	Theoretical Definition	Operational Definition
1997	J. Saifon A. Prissana	Quality of life in the elderly with CHD	Zhan's QOL assesses through physical, psychosocial, and including four dimensions: Life satisfaction, Self Concept, Health and Functioning, and Social Economic Assessments both subjective and objective QOL	by physical functional Questionnaire by Shabetai and adjusted by Faris & Stotts. QOL means sense of well-being, satisfaction of life through the process of perception and self assessment. Assessment by QOL interview form developed by H.Somphan under the conceptual framework of Zhan It is composed of four dimensions: Life satisfaction, Self Concept, Health and Functioning, and Social Economic -Life satisfaction = 10 items about satisfaction in present conditions, treatment, way of living, successful life -Self Concept = 10 items about health status, personality, self value, religious belief -Health and Functioning = 10 items about illness, functional capacity such as ADL, self care, exercise, sexual relationships, and routine activity. -Social Economic = 10 items about relationships in family, and friends such as social activity, education, and occupation

Table1. (Continue)

Year	Author	Title	Theoretical Definition	Operational Definition
1998	P. Somchit	QOL in CAD before and after PTCA	<p>QOL in the concept of health status or functional status which is effected by sickness and treatment. Proposed concept by Bergner.</p> <p>QOL means Health Status or functional capacity</p> <p>Health Status or good Ability in different Functional Role shows good QOL</p> <p>Health status and sickness are effected by behavior and functional role of the person. Sickness shows the personal experiences concerning illness and perceives it by the ability of ADL, role function, changing in behavior, feeling, and personal attitude.</p>	<p>Over all QOL means functional capacity of a person in physical, psychosocial and other aspects which were assessed by Assessment Tool Sickness impact Profile (SIP) developed by Bergner. If impacted scores are high means poor QOL.</p> <p>QOL in physical dimension means functional capacity of person in body movement, transference, including physical care and mobilization.</p> <p>QOL in psychosocial dimension means personal capacity in social function, active behaviors, emotional behavior and communication.</p> <p>QOL in general dimension means personal capacity in working, home management, eating food, resting and sleeping, recreation and leisure time.</p>
1998	P. Penroong	QOL among Patients with CAD before and after coronary stent implantation	Bergner's Sickness Impact Profile	Same as above

Table1. (Continue)

Year	Author	Title	Theoretical Definition	Operational Definition
1998	L. Siriporn	QOL of patients with CAD	<p>QOL = Health related quality of life and Mental Health</p> <p>Health related quality of life means value of life time changed by sickness. Physical function, thinking and social opportunity effected from disease, trauma, treatment, and health care policy.</p> <p>Health related QOL (HRQOL) is the well known index to measure the impact of sickness or effect from treatment on patients' life.</p> <p>The short form 36- Health Survey was used to measure general HRQOL.</p> <p>SF-36 is composed of 8 domains: Physical Function, Role limitation due to physical health problems, Pain, Social functioning, General mental health, Role limitation due to emotional problems, Vitality, and General health perception.</p> <p>A person will become defensive when disturbed and lead to changes and cause psychological stress.</p> <p>People try to eliminate this stress to keep a psychological balance.</p> <p>If it a success, it means having good mental health.</p> <p>If it does not succeed, an emotional state will occur.</p>	<p>QOL = Health related quality of life and Mental Health</p> <p>Health related quality of life means value of life time changed by sickness. Physical function, thinking and social opportunity effected from disease, trauma, treatment, and health care policy.</p> <p>Mental Health means well-being, both physical and mental, good adaptation to other people, the social and surrounding environment without trouble to himself or other persons but well and useful for themselves</p>

Table1. (Continue)

Year	Author	Title	Theoretical Definition	Operational Definition
1999	R. Jittawadee	Effects of Nursing care on Theory of Goal Attainment on Activity of Daily Living and Life Satisfaction in Elderly Patients with MI	<p>Neugarten defined Life Satisfaction as a sense of happiness , gratification, self-esteem, self satisfaction, acceptance of life - success or failure , good attitude to oneself , others, society and the world.</p> <p>Life Satisfaction is the sign of psychological well-being and good QOL.</p> <p>Neugarten's Life Satisfaction is composed of five components: zest, resolution and fortitude, congruence between desired and achieved goals, a positive self concept and mood tone.</p>	<p>Life Satisfaction means perception of satisfaction , admiration, gratification with present conditions or the coming ones in elderly MI patients which is the assessment result of the difference between will and success. It is the self perception which is Assessed in four components:</p> <p>mood tone , zest, congruence between desired and achieved goal, and resolution and fortitude (Neugarten).</p> <p>Assessment by Neugarten's Satisfaction form which was adjusted and translated in Thai by K. Srireun named Life Satisfaction Index A : (LSIA)</p>

Table1. (continue)

Year	Author	Title	Theoretical Definition	Operational Definition
1999	Y. Monsin	QOL of Patients with CAD due to smoking	<p>QOL is personal perception under the roles of culture, value, life goal, expectation, standards, and other people which is the complex result of physical health, mental health, level of independence, social relationships, environment, and self confidence.</p> <p>WHOQOL-BREF is the short form of WHOQOL-100. It can be applied to every culture and emphasizes the personal perception of well-being and progression of treatment.</p> <p>Time trade off (TTO) is one of three techniques of utility measure of QOL.</p> <p>Utility measure is the economic assessment of QOL , by setting up QOL Index be vary between good health = 1 and death = 0 but it can't show QOL in each domain.</p> <p>Time trade off (TTO) assesses QOL of patient by giving two choices to choose from: First , present health status with chronic illness in life time duration (t) which remains according to the limit of life. Second, The duration (x) of shortening life time with good health . Asking this two Questions to the samples until there is no difference of ideas from the samples.</p>	<p>QOL means personal perceptions about status in the physical, psychological, level of independence, social relationships, environment, and self confidence under pinning of culture, value, and each personal life goal measured by WHOQOL-BREF and Time Trade Off.</p>

Table1. (Continue)

YEAR	Author	Title	Theoretical Definition	Operational Definition
2001	M. Pornpimol	Comparison of QOL in CAD patients between four and three month after CABG	<p>Bergner's conceptual framework.</p> <p>QOL is strongly associated with health status and functional status. So QOL can be measured by changes of health and/or functional status, which occur all the time during treatment and diagnosis.</p> <p>When signs and symptoms appear, the patients then perceive their sickness.</p> <p>Sickness is an individual's own perception of health and changes in behavior related to carrying out daily life activities. In addition, the process of the diagnosis and treatment also hinder them from doing normal activities. The outcome of the impact of the sickness is measured as individual dysfunction.</p> <p>SIP instrument is based on Bergner's concept.</p>	<p>QOL means the behavior effect of sickness and its consequent therapy as perceived by the individuals receiving treatment as a response to the SIP Questionnaire. A high score indicates the greater dysfunction or lower QOL.</p> <p>It consists of three dimensions: physical, psychosocial, and independent.</p> <ul style="list-style-type: none"> - Physical Dimension is defined as dysfunction of the patients in 3 categories: ambulation, mobility, and body care and movement. - Psychosocial dimension is defined as dysfunction of patients in 4 categories: social interaction, alertness behavior, emotional behavior and communication - Independent dimension is defined as dysfunction of patients in 5 categories: sleep and rest, eating, work, home management, and recreation and pastime. - Health Status is defined as occupation, functional classification, presentation of chest pain, and antianginal drug used of the CAD patients before and three month after the CABG surgery as reported by the patients themselves and the physicians' written report.

Table1. (Continue)

Year	Author	Title	Theoretical Definition	Operational Definition
2003	S. Aem-om	The effects of a self-care promotion program on QOL and reduction of risk of CHD patients	<p>The development of Ferrans conceptual model of QOL by based on the adoption of an individualistic ideology, which recognizes that QOL depends on the unique experiences of life for each person.</p> <p>Four domains of QOL are: health and functioning psychological / spiritual, social and economic, and family.</p> <p>Thai version of QOL Index- cardiac version-IV Ferrans& Powers, 1998) that developed from QOL Index- Cardiac version-III by Ferran to assess the effects of a self care program</p>	<p>QOL is the person's sense of well-being that stems from satisfaction or dissatisfaction with the area of life that is important to him/ her (Ferrans & Power, 1998).</p> <p>The QLI measures both satisfaction and the importance of various aspects of life. The instrument consists of two parts: (70 items: 35 items / part):</p> <ul style="list-style-type: none"> - the first part measures satisfaction with various aspects of life and - the second part measures the importance of those same aspects. <p>Possible scores are calculated for QOL overall and in four dimensions: health and functioning, psychological / spiritual, social and economic, and family. Scores range from 0 - 30 and high score means a good QOL.</p>

From Table1, In conclusion, the review of QOL instruments related to coronary heart disease and myocardial infarction in Thailand have been shown the operational definition involved sense of well being which composed of life satisfaction in 4 dimensions which are physical dimension , psycho-spiritual dimension, social and family and economic dimension. It is important to note that even though the name of the fours dimensions appears differently in several studies, they focus in the same aspects of measurement.

Quality of life in patients with post myocardial infarction

With the effect of disease on the patients' lives, it was necessary to explore the quality of life in patients with post myocardial infarction for the benefit of developing the optimum quality of life in patients. This section will look at:

From reviewing the studies of life experience in patients with post MI from 1989 to 2004, there were three studies completed by Nathongkhan, 2000; Tumngong, 1998; and Juntawises, 1996. They demonstrated the impact of MI on the patient's QOL and diminished competencies in their lives as follow:

Physical and functioning: The competency of the patients in the activity of daily living, the way of living, working achievement, and social role were decreased, which caused patients to feel hopeless, and of low self-esteem. Patients said that they couldn't do as many things as before due to symptoms of tiredness, fatigue, and acute chest pains. For example, patients mentioned that it was: ...decreasing the efficiency of individual activities or occupational work due to tiredness (Juntawises, 1996) ...unable to do hard work due to fear of chest pains and tiredness (Tumngong, 1998)

Psychological and spiritual well-being: Because of the threatening disease, patients had feelings of low self esteem, uncertainty, fear of death alone and of being a burden on the family and other persons. For the example, the patient said that:

...he lets their spouse take care of their children alone during which they just lie on the bed with out any worth; ... future planning for their lives and their families seems to be impossible and a failure (Juntawises, 1996).; ... feelings of disheartening about their prosperity in their work because of their illness (Juntawises, 1996).

Socio-economics: patients with post MI especially with the patient who can not reimburse the expenses for treatment, medicine, and the laboratory, began:

... asking for a reduction in taking the medicine or to be taken off some medicine (Nathongkhan, 2000); ... refusing or postponing to be treated by surgery; ... feelings of discouragement about their illness and feeling unwilling to ask some questions from their doctors and nurses.

Patients with post MI suffer from a significant threat to both the financial and material well-being of the patients and their families. There is a decrease in competence at work, and an increase of absence at work which causes the decrease of incomes. (Tumnong, 1998; Juntawises, 1996)

Family: Family is impacted on due to the losing of the main income of the family and functional changes from a leader to be a member of the family. Patients feel dependent and can not maintain the role of father, husband, mother and wife or any member of the family completely. Patients can not do hard work as before, therefore the income is decreased. The following effects means there is not enough money for the education of the children, some children must work instead of their parents. Some patients were shy or embarrassed to go out side because of the burden for others.

The family aspect of the quality of life are family health, spousal relationships, family happiness, and children (Ferrans & Powers, 1996). Any illness affecting a family member will inevitably affect that individual's family and their quality of life. Factors that affect family quality of life include family structures and interaction patterns; the availability of social networks or support resources; the potential for adaptation; and family philosophy, such as beliefs, attitudes, values, and perceived stressors; and the impact of illness (Jassak & Knafl, 1990).

Partners and other family members are often more psychologically disturbed than the patient and this may have an important influence on the patients own anxiety and long-term outcome (Svedlund, M., 2003; Doerr, 1979; Cay, 1982). Post coronary women consistently report a reluctance to make any lifestyle changes that might interrupt family routine (Johnson & Morse, 1990; Varvaro, 1993). Post MI patients had decreased working performance and role insufficiency (Juntawises, 1996). Adults with chronic illnesses (n=227) had also identified family relationships as an important area in the quality of life (Burckhardt, Woods, Schultz, & Ziebarth, 1989).

In addition, MI cannot be cured completely but it can threaten a patient's life at anytime and cause death. During remission periods or post MI, patients are faced with the problems of relapsing from the disease, changing lifestyles especially self care, changing of their social life and relationships or interactions with others. Most of the patients cannot adapt their lifestyle such as with: smoking, exercise, weight control, proper food specified for the disease, and other behaviors for the control the disease. Some patients are able to deal with the problems directly and adapt their lives for some period of time such as three months and with a lack of proper help. This reflects the deficit of patient's knowledge due to the lack of support from healthcare delivery systems about information, services and other media and the deficit of

understanding of health care providers about precise patient's needs or problems due to the differences in the individual person in different communities.

For example, patients said that "...physicians and nurses did not give me any information; ...would like to have some material about self care; ...not enough coronary care clinics, using too much time for each follow up, limitations of service competencies in some hospitals due to a lack of cardiologists, and experts in specific cardiac treatments in rural areas"(Juntawises, 1996).

Beyond that, some patients are frequently hospitalized so it has increased the expenditure of patients, their family, and the government. The most important concern is the premature death of patients with post MI.

Post Myocardial Infarction patients have to face many unpredictable health conditions, for instance, a severe chest pain (Urden, Lough and Stacy, 1995). The severe symptoms disturbs their activities and changes their lifestyles (Vender Bury, 1987). At the same time, the patients also suffer from other signs and symptoms such as shortness of breath and fatigue, recurrent myocardial infarction, congestive heart failure, arrhythmia and sudden death (Braunwald, 1997; Schantan Alexander, 1994; Thalen, et al., 1994; Willerson & Cohn, 1995). They influence the individual's well-being and dependency (Upchurch, 1999). Patients feel fearful, anxious and uncertain (Rugwongprayoon., 1996; Haak & Huether, 1992). Many post MI patients experience emotional distress, fear of dying, and family turmoil, fail to return to work when physiologically capable of doing so, are unable to return to their previous level of sexual activity, and are not capable of making the necessary diet and exercise changes.

Acute management strategies continue to be aimed at limiting the infarct size, whereas holistic approaches to the patient and family adjustment must target seeking prompt treatment when symptoms are present , psychological adjustment, stress

reduction, and patient and family education for self care and risk reduction. In addition, many problems from disease and lots of changes happening in their lives have affected patients and their families; they must have proper management to overcome all stresses to maintain their optimum quality of life by knowing the causes precisely.

In post MI patients, angina pectoris or chest pain is the most common symptom and is the cause of readmission (Tantithum, 1993; Sounthornvathee, 1996; Hartford, 1993). Angina pectoris is life threatening, cannot be predicted, and effects the patient's activity ability. 3-35% of CAD patients could not do normal activities (Yate & Belknap, 1991). Some patients suffered a decrease in their working ability (Posanakretsana, 1991), Some left their jobs (Loose & Fernhall, 1995). Disease effects patients' roles, hobbies, social activities and psychological well-being (VandenBurge, 1987) leading to the behavioral changes in their lifestyle and their roles for balancing their heart abilities and conditions. Some have depression (Mickus, 1986; Yate & Belknap, 1991; Riegel, et al, 1997; Robinson, 1999).

Tantithum (1993) studied Model of helping patients with acute Myocardial infarction to develop self-care capabilities and found that there were five stages of patients' responses to their illnesses: 1) fear of dying, 2) fear of disabilities, 3) fear of recurrence of heart attack, 4) feeling uncertainty especially after being discharged from the hospital and 5) feelings of having difficulties in performing self-care to reduce the risk factors.

As a consequence, HRQL instruments have evolved in order to assess the impact of disease, effect of treatment and other variables affecting people's lives. They provide an assessment of the patient's experience of his or her health problems in areas such as physical function, emotional function, social function, role performance, pain and fatigue. Thus, HRQL can be defined as a health status and

viewed as a continuum of increasingly complex patient outcomes: biological/physiological factors, symptoms, functioning, general health perceptions and overall wellbeing or quality of life (Wilson, & Cleary, 1995).

While healthcare professionals may be more interested in changes in objective physical measures, patients (and family members/careers) are equally interested in a therapy that changes their symptoms, physical function and social roles. HRQL instruments measure the effects of treatment on aspects which patients are continuously concerned about. Because these instruments describe or characterize what the patient has experienced as a result of healthcare, they are useful and important supplements to traditional physiological or biological measures of health status (Wilson, & Cleary, 1995).

In conclusion, patients with post myocardial infarction had been disturbed and significantly suffered in their lives from illness by the empirical evidence as presented in the above literature. It meant that the patients' quality of life was decreased. Quality of life is a broad concept and has many theoretical bases in which to understand the quality of life.

The theoretical basis of quality of life

There are many quality of life conceptual models used in nursing research (King, et al., 1998) such as: city of hope model by Ferrell, Wisdom, & Winzl (1991); Ferrans and Powers QOL model (1985); Padilla and Grant (1985); Cella (1994), Oleson (1990); Zhan (1992); Cowan, Graham, & Cochrane (1992); and Burckhardt (1985).

City of hope model by Ferrell, Wisdom, & Winzl (1991) and Ferrans and Powers QOL model (1985) view QOL from multidimensional, subjective perspective with the implicit assumptions based on individualistic ideologies and view individuals

as complex beings, health as a multi dimensional construct, and QOL as dependent on the unique experiences of each individual. Yet, each model represents a unique perspective of QOL and reflects the definition of QOL used by the researchers.

Padilla and Grant (1985) defined QOL as a personal statement of the positivity or negativity of attributes that characterize one's life and describes an individual's ability of function and the satisfaction in doing so. QOL is a multidimensional concept that measured the dimension of psychological well-being, physical well-being, body image concern, response to diagnosis or treatment, and social concerns. The model depicted the dimensions of QOL as dependent outcome variables, and nursing process activities manipulated by the investigator as independent variables. Mediating variables as a necessary antecedent of QOL that affect QOL are cognitive-emotional changes in the clients that enhance self-perceptions and can be affected by nursing care. Extraneous variables such as treatment characteristics, diagnostic characteristics and personal characteristics may affect the outcomes.

Oleson developed a model of subjectively perceived QOL. The critical attributes of QOL are satisfaction and happiness. Antecedent is the life domain which categories of health and functioning, socioeconomic, psychological/spiritual, and family. The consequences of a positively perceived QOL are the development of potential and self-actualization. QOL was conceptually defined as a cognitive experience, manifested by satisfaction with life domains of importance to individuals, and an affective experience, manifested by happiness.

Zhan (1992) also developed a model of QOL based on the definition of QOL as the degree to which a person's life experiences are satisfying. Zhan described QOL as a multi-dimensional concept that cannot be completely measured by either a subjective or an objective approach. The dimensions of Zhan QOL are life

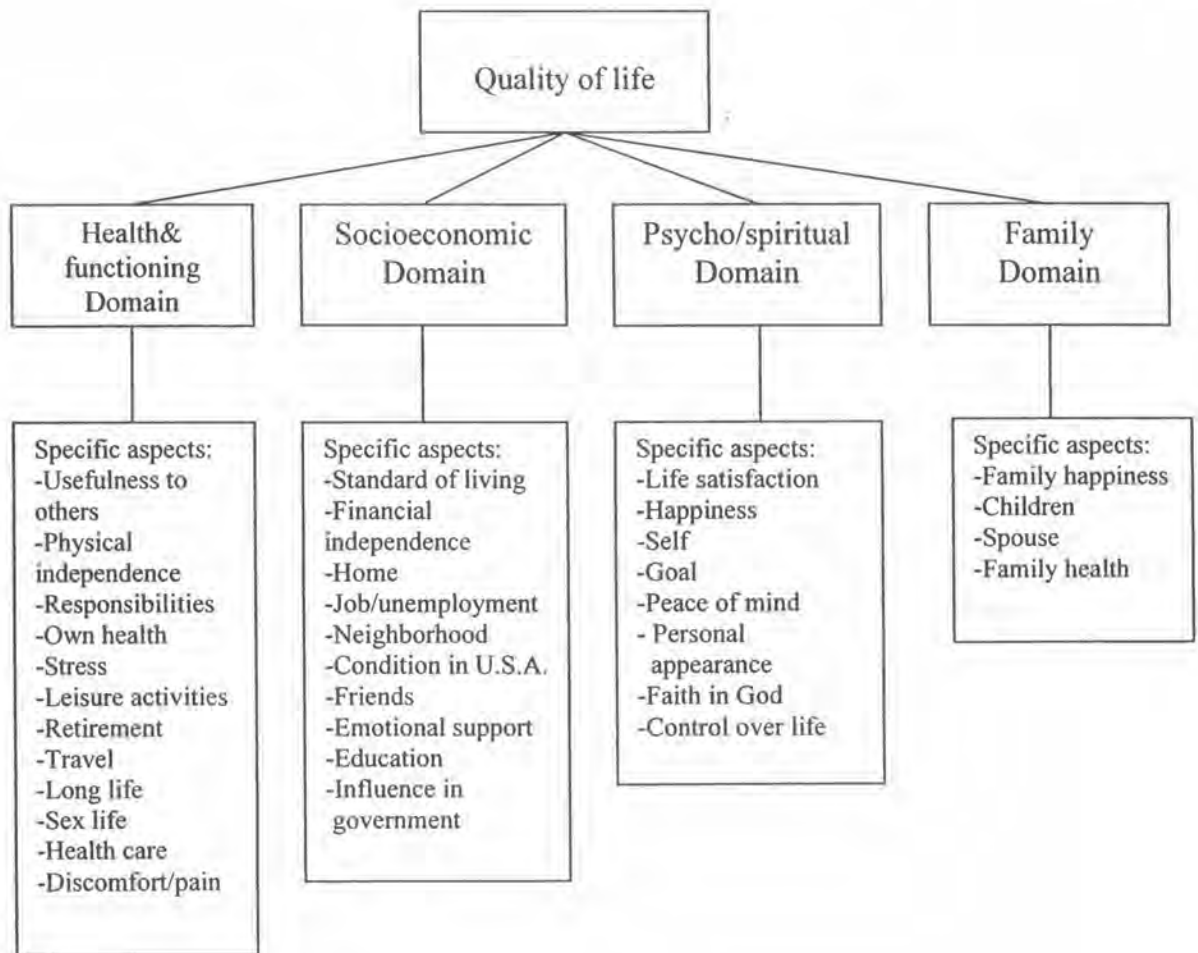
satisfaction, self concept, health and functioning, and socioeconomic factors. According to this model, QOL is also influenced by one's personal background, health, social situation, culture, environment, and age. The perceived meaning of QOL comes from the interaction between the person and his or her environment.

Cowan, Graham, & Cochrane (1992) developed the QOL model for chronic illness. In this theoretical model of QOL, the concepts of symptom distress, functional alterations, and cognitive adaptation were identified as mediating variables. Perceived QOL is viewed as the outcome variable and defined as the extent to which the person's assessed level of satisfaction with life and sense of well-being is positive while the antecedent variables are severity of illness, aggressiveness of treatment, and socioeconomic level.

Burckhardt QOL model (1985) explored the impact of pain and functional impairment on the QOL of persons with arthritis by using a cognitive framework to develop a causal model in which the disease-related variables interacting with demographic and social factors were hypothesized to indirectly affect quality of life through psychological mediators. Definitions of this QOL model are focused on satisfaction and subjectivity.

Ferrans and Powers (1985) developed the QOL model as figure 1 by using the ideological approach. The individualistic view means in which individuals personally define what quality of life is for them with the recognition of belief that different people value different things. Because of this, there is no single quality of life for all people with the same life condition. Quality of life defined as a subjective concept in term of satisfaction was the most congruent with the individualistic approach. This QOL model has four components: health and functioning, psychological/spiritual, social and economic, and family (Figure 1).

Figure 1. Ferrans & Powers' Model (1990)



Concerning quality of life in perspective of a patient, quality of life trials can help improve the quality of that patient's treatment and outcomes. In addition, quality of life trials may be used to differentiate between two therapies with marginal differences in mortality or morbidity and to compare outcomes between two different treatment modalities such as medicine versus surgery. Quality of life data may also be used to estimate the burden of specific diseases and to compare the impact of different diseases on functioning and well-being. Health planners of the countries used the quality of life data to improve the allocation of health resources to solve all the health care problems (Spilker, 1990).

Quality of life concept has been approached from many perspectives, including physical well-being, the spiritual and psychological approaches, and the social economic, and political. In the current clinical setting, the conceptual formulation that has emerged defines quality of life functionally by patients' perceptions of performance in four areas: physical and occupational, psychological, social interaction, and somatic sensation. However, the specific terminology differs among investigators. Quality of life will fluctuate over time, the result of changes in any or all of its component parts: an intensely patient-centered approach. In some respects it is a departure from the more accustomed outcome measures, because the focus is on patient perception, rather than measured physiological values.

Health status is increasingly referred to as quality of life and quality of life is increasingly referred to as health-related quality of life. Health-related quality of life, like subjective health status, is patient based, but focuses more on the impact of a perceived health state on the ability to live a fulfilling life (Bullinger, et. al. 1993). From a health (or disease) perspective, quality of life is referred to the social, emotional and physical well-being of patients following treatment (Greer, 1984), as the impact of disease and treatment on disability and daily functioning (Kaplan, 1985)., as a double-sided concept, incorporating positive as well as negative aspects of well-being and life, and it is multidimensional, incorporating social, psychological and physical health. It is also ultimately, a personal and a dynamic concept for, as health status deteriorates perspectives on life, roles, relationships and experiences change (Morris, et al., 1986; Sherwood, 1977). Grant et al. (1990) define quality of life as a personal statement of the positively or negatively or attributes that characterize one's life.

The contemporary of cardiology deals predominantly with the care of the patients with chronic illness. The goal of therapy for a chronic illness is generally not to cure the disease, but rather to alleviate its symptoms, improve the patient's functional capacities, and retard the progression of the underlying disease. Thus, an evaluative component of the way in which a patient's life is affected by the illness and its care, in addition to the traditional measures of morbidity and mortality, appears warranted.

Health-Related Quality of life concerns those attributes valued by patients, including their resultant comfort or sense of well-being; the extent to which they are able to maintain reasonable physical, emotional, and intellectual function; and the degree to which they retain their ability to participate in valued activities within the family, in the work place, and in the community (Wenger, et al., 1990).

Bowling (1995) offered that researchers who construct health related quality of life measurement scale frequently simplify issues of theoretical importance in order to satisfy the need for developing valid measures for use with large and varied populations. However, there is an inherent contradiction in such an approach because it is impossible to conduct a valid study which taps in to the quality of life without a clear definition of quality of life.

The literature review of the quality of life in patients with coronary artery disease and myocardial infarction both definitions and the instruments used in Thai research was done from the data base of Mahidol University and Thai nursing research by used the key words for instance: quality of life, QOL, well being, health status, satisfaction, happiness, instruments, measurement, coronary artery disease, CAD, myocardial infarction, MI. There were ten quality of life studies used to analyze in this study presented in Table2.

Table2. The Studies of Quality of Life in Thai patients with post Myocardial infarction

Year	Title	Independent Variable	Dependent Variable	Sample	Instrument	Statistics	Results
1987 R. Prapa	Factors impacting on QOL of MI patients Descriptive Research Framework: Cognitive-Person Environment Framework Human and environment depend on each other, and their relationship leads to the outcome of adaptation.	Factors: sex, age, marital status, occupation, duration of illness, frequency of hospitalization, educational level, monthly income, severity of physical impairment	QOL	Purposive sampling: Diag. CAD at least 6 months No other chronic disease No severe manifestations (< stage 3 NHA) conscious, can hear, speak & see, willing to cooperate 120 CAD patients	1. Demographic data 2. severity of physical functional disability---developed by author $\alpha = .78$ 3. perceiving of social support measure ---developed by author $\alpha = .78$ 4. attitude measure ---developed by author $\alpha = .89$ 5. Burckhardt 's QOL measure --adjusted by author : -Life satisfaction Index (general) (LSI-Z) by Wood $\alpha = .75$ -Flanagan's Specific domain of life satisfaction scale $\alpha = .89$ -Overall QOL rating	-Descriptive statistics -Pearson Product Moment Correlation Coefficient - Multiple Correlation Coefficient - SPSS for Stepwise Multiple Regression to find QOL predictors	- Sex – male 68% - Age – 50-70 yrs 70% - Marital status - marriage 78.3% -Education -Primary school 45% Secondary school 25% - Occupation- no occupation 60% - Income - enough 61.7% > 8000 baht/ month 35% - Duration of illness - . 5-5 yrs 72.5% - Frequency of hospitalization 1- 5 times 78. 3% - Mean score of *severity of physical functional loss = 32. 314, (total = 0-10), S.D = 21.23 *Attitude = 35. 8 (total = 10-70), S.D. =14. 49 * Perceived SS = 40.34 (total = 0-48), S.D. = 6. 324 * QOL = 107. 33, S.D.=14.23 Most patients have good QOL. The research results 1. Education, income related to QOL sig p< .01 2. Severity of physical functional loss related to QOL sig p<.001 3. Attitude related to QOL sig p<.001 4. Perception of SS related to QOL sig P<.001 5. Attitude, perception of SS, educational level can predict QOL p < . 001

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variables	Sample	Instruments	Statistics	Results
1996 K. Kusuma	QOL after CABG Descriptive Research Framework: Ferran & Powers's QOL Life Satisfaction and Physical Functional Capacity	Life Satisfaction	Physical Functional QOL	Purposive Sampling CAD patients with CABG Functional class I, II (NHA) After CABG 3 months Understand Thai Able to answer Questionnaire, Willing to participate in this study	1. Demographic data 2. Life Satisfaction Questionnaire by Ferran & powers Reliability = .71 (30 cases) .88 (100 cases) For each domain: - health & function = .72 - Socioeconomic = .72 - Psychological/ spirit = .69 - Family = .55 3. Functional Capacity Questionnaire by Shabetai Reliability = .93 (30 cases) .89 (100 cases)	Demographic statistics t-test for comparison	Sex- male 68% Female 32% Age- 50-65 55% Marriage 80% Primary and Secondary school 67% Employee, Government officer, commerce 19%, 15%, 12% Not changed occupation 54% not work 35% Income < 5000 54%, Reimburse money 71% Underlining disease: HT, DM, Hi- cholesterol, gout, 50% 43% 31%,19% No chest pain after surgery 79% No HF 71% Life Satisfaction after CABG is high and be a positive correlation with functional capacity significantly There was no significant difference in satisfaction between chest pain or no chest pain groups but no chest pain group has better functional capacity than chest pain group. There was a significant correlation between satisfaction and physical function, only for no chest pain group

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variables	Sample	Instruments	Statistics	Results
1997 J. Saifon	QOL in the elderly with CAD Descriptive research Framework: Zhan's QOL	Personal factors: Sex, age, marital status Socioeconomic factors: education, income	QOL	Accidental sampling 120 elderly CAD patients	- Demographic data interviewing form: population factors socioeconomic factors health factors (Severity of physical functional lost, Reliability = . 92)	- Descriptive statistic - Pearson's product moment correlation coefficient - t- test - Multiple correlation coefficient	- Sex: male = 52. 5% female = 47. 5% - Age 60-74 = 78. 3% - Marriage = 65. 0% - Buddhism = 95% - Member status = 60% - Single family = 70%
	QOL in the elderly with CAD Descriptive research Framework: Zhan's QOL	Health factors: Duration of illness, frequency of hospitalization, severity of Year function capacity	QOL	Accidental sampling 120 elderly CAD patients	- QOL questionnaire: Life Satisfaction Self concept Health and Functioning Socioeconomic Reliability = . 88	- F -test - Stepwise multiple regression	- Primary school level = 56. 7% Secondary school = 24. 2% - Not working = 87. 5 % - Income > 8000 baht = 34. 2% < 2000 baht = 32. 5% - Source of income: offspring = 67. 5% - Reimburse for medicine expense = 50. 8% Free medicine from social well-fair = 30% - Duration of illness 1-5 yrs = 61. 7% - frequency of hospitalization < 5 times = 57. 5% - no surgery =90% - comorbidity = 50% - Severity of physical functional lost mind = 35. 8%, much =25% Research Result: 1. Overall QOL in elderly was good: life Satisfaction, Self Concept, Health and Function were good, Socioeconomic was mind, Satisfaction in each item was little in exercise, social activity.

Table2. (Continue)

Year	Title	Independence Variables	Dependence Variables	Sample	Instruments	Statistics	Results
							<p>.2. Sex had positive relationship with QOL significantly $r = .263, p < .01$ Age and marital status had negative relationship with QOL, significantly $r = -.350, r = -.307, p < .00$</p> <p>3. Education, income had positive relation to QOL significantly $r = .475, r = .554, p < .001$</p> <p>4. Duration of illness, frequency of hospitalization, severity of functional lost had negative relationship with QOL significantly $r = -.201, r = -.285, r = -.603, p < .05, .01, .001$</p> <p>5. Severity of functional lost, income, sex, duration of illness, can be predicted QOL significantly $p < .05$.</p> <p>They influence QOL = 55.35 %</p>

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
1998 P. Somchit	<p>QOL in Patients with CAD Before and After PTCA</p> <p>Descriptive research</p> <p>Purpose:</p> <p>To compare overall QOL and certain dimension of QOL before, and at 2 wks, 6wks, 3 months after PTCA</p> <p>Framework:</p> <p>Bergner's QOL Health and function are the result from sickness and treatments.</p>	<p>PTCA</p> <p>Hypothesis:</p> <p>After PTCA 2 wks, 6wks and 3 months, CAD patients have higher overall QOL and each domain than before PTCA significantly</p>	<p>QOL: before After PTCA</p> <p>QOL has 3 domains:</p> <ol style="list-style-type: none"> 1. physical domain as functional capacity in moving, self care . 2. psychosocial domain as relationship capacity, alert, and emotional behaviors and communication 3. general as working capacity, home management, eating, rest , recreation and leisure time 	<p>Purposive Sampling 35 CAD patients with PTCA</p>	<p>- Demographic Questionnaire Including JAS (Jenkins Activity Surveys</p> <p>Reliability = . 88 (35 CAD with PTCA)</p> <p>- QOL assesses by Sickness Impact Profile (SIP)</p> <p>Reliability :</p> <p>Overall QOL = . 95 (12 cases)</p> <p>Physical = . 94</p> <p>Psychosocial = . 84</p> <p>General = . 88</p> <p>Overall QOL = . 74, . 77, . 75, . 87 (before PTCA, after 2 wks, 6 wks, and 3 months)</p> <p>Physical = . 70 - . 76</p> <p>Psychosocial = . 52 - . 72</p> <p>General = . 45 - . 71</p>	<p>Descriptive Statistics Nonparametric Statistics</p> <p>Friedman two-way ANOVA</p> <p>Chi -Square</p> <p>Multiple comparison by Tukey's test</p>	<p>Sex: male 68. 6 % Female 31. 4%</p> <p>Age > 41 yrs = 97%</p> <p>Buddhism = 97.1%</p> <p>Primary and Secondary school = 68. 6%</p> <p>House wife = 48. 6%</p> <p>Income < 10000 / month = 31. 4%</p> <p>Reimburse Medical expense = 48. 6%</p> <p>No financial problem = 80%</p> <p>Diagnosis:</p> <p>Stable angina = 24%</p> <p>Post MI = 2. 9% = 1 case</p> <p>Severity of symptom :</p> <p>Grade II = 51. 4%</p> <p>Frequency of chest pain:</p> <p>1-2 times/ week = 40%</p> <p>> 7 times/ week = 34. 3%</p> <p>used medication for relief chest pain: 1 tab/ time = 77. 1%</p> <p>Research results</p> <ol style="list-style-type: none"> 1. After PTCA 2 wks, 6wks and 3 months, CAD patients have higher overall QOL and each domain than before PTCA significantly $p < . 05$ 2. QOL at 6 wks and 3 months was better than 2 wks significantly $p < . 05$ but 6wks and 3 months did not differ. 3. Decrease severity and frequency of chest pain and also required less medication for relief pain significantly $p < . 05$. <p>QOL before PTCA is good.</p>

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
1998 P. Penroong	<p>QOL among Patients with CAD Before and After Coronary Stent Implantation</p> <p>Descriptive research</p> <p>Purpose:</p> <p>To compare overall QOL and certain dimension of QOL before, and at 2 wks, 6wks, 3 months after Coronary Stent Implantation.</p> <p>Framework:</p> <p>Bergner's QOL Health and function are the result from sickness and treatments.</p>	<p>Coronary Stent Implantation</p> <p>Hypothesis:</p> <p>After PTCA 2 wks, 6wks and 3 months, CAD patients have higher overall QOL and each domain than before Coronary Stent Implantation significantly.</p>	<p>QOL: Before After Coronary Stent Implantation</p>	<p>Purposive sampling 34 patients with CAD who under went coronary stent implantation (25 men, 9 women)</p> <p>Exclusion criteria:</p> <ul style="list-style-type: none"> - Received PTCA and Stent Implantation in the same time. - Heart Failure, Pul. Edema - Unable to answer questions, cognitive defect 	<ul style="list-style-type: none"> - Demographic Questionnaire Including JAS (Jenkins Activity Surveys <p>Reliability = . 79 (12 CAD with Stent Implantation or PTCA)</p> <ul style="list-style-type: none"> - QOL assesses by Sickness Impact Profile (SIP) <p>Reliability :</p> <p>Overall QOL = . 95 (12 cases)</p> <p>Physical = . 94</p> <p>Psychosocial = . 84</p> <p>General = . 88</p> <p>Before Stent Implantation:</p> <p>Overall QOL = . 95</p> <p>Physical = . 91</p> <p>Psychosocial = . 93</p> <p>General = . 72</p> <p>After 2 wks, 6 wks, and 3 months</p> <p>Overall QOL = . 76, . 93, . 95</p> <p>Physical = . 43, . 91, . 85</p> <p>Psychosocial = . 94, . 87, . 92</p> <p>General = . 73, . 74, . 88</p>	<p>Descriptive Statistics Nonparametric Statistics</p> <ul style="list-style-type: none"> - Friedman test - Wilcoxon signed rank Test 	<p>Sex: male 73. 5 % Female 26. 5%</p> <p>Age > 60 yrs = 55. 9%</p> <p>Buddhism = 97.1%</p> <p>Primary and Secondary school = 58. 9%</p> <p>House wife / Retire = 52. 9%</p> <p>Income > 50000 / month = 32. 4%</p> <p>Reimburse Medical expense = 76. 5%</p> <p>No financial problem = 76.5%</p> <p>Diagnosis:</p> <p>Post MI = 44. 1%</p> <p>Comorbidity 3-4 diseases = 52. 9%</p> <p>Research results</p> <ol style="list-style-type: none"> 1. After PTCA 2 wks, 6wks and 3 months, CAD patients have higher overall QOL and each domain than before Coronary Stent Implantation significantly p< . 01 2. QOL at 6 wks and 3 months was better than 2 wks and 3 months was better than 2 and 6 wks significantly p < . 05. 3. Decrease severity and frequency of chest pain and also required less medication for relief pain significantly p< . 01, . 001. <p>QOL after Coronary Stent Implantation is better than QOL before Coronary Stent Implantation.</p>

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
1999 L. Siriporn	QOL of patients with CAD Purposes: Compare the QOL of patients with CAD before and after treatment	Age ,Income, Hx of MI, Severity of disease Hypothesis: 1. QOL of CAD patients after treatment will be better than before treatment. 2. QOL of CAD patients with less in age, enough income, no Hx of MI, and low severity of illness will be higher QOL than CAD patients with more age, not enough income, Hx of MI, more severity of disease. 3. CAD patients after treatment will have more psychological problems than before treatment.	QOL	Purposive sampling with inclusion criteria: Diagnosis by cardiac catheterization found 50% of lumen stenosis at least 1 vessel. Or Exercise stress test found ST depress more than 0.2mlv and ST depress found more than 3 cardiac cycles or after stop exercise, EKG cannot return to normal. CAD 202 cases and can be follow up after treatment only 150 = 74. 26%	Questionnaire composed of: - Demographic data - The short form 36 Health Survey (SF- 36) - Thai GHQ-30	Descriptive Statistics Analytical Statistics: - General Linear Model- Repeated Measures - Mc Nemar's test - ANOVA - Kruskal Wallis One Way Analysis of Variance	Sex: male 71. 3 % Female 28. 7% Age 60 – 69 yrs = 43. 4% Not education - Primary = 41. 2% and Secondary school = 22. 0% No occupation 46. 0% Enough income = 80. 7% Severity class II =41. 3% No Hx of MI = 62.0% Have DM and HT = 40.7% Treat with PTCA = 44% Research Result: Before treatment, patients had higher physical and mental health scores, low social function scores, and had general health perception that health would deteriorate. After treatment 6 months, 37% could return to their normal work, 43. 2% could do their jobs with some limitations, 2. 5% had to change career or job position, 4. 9% could not return to their jobs and 12. 4% stop working.

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
1999 Y. Monsin	QOL of Patients with CAD due to Smoking Analytic cross sectional study	Age, sex, marital status, education, family, role in family, occupation, illness impact on their work, income, enough income, medical expense, source of income, burden, severity of illness, duration of illness, frequency of hospitalization, type of treatment, symptoms in 2wks, smoking, comorbidity.	QOL	<p>Purposive sampling for studied group and Accidental sampling for reference group.</p> <p>Studied group: 250 CAD patients due to smoking, no abnormal or defect, able to communication and willing to participate</p> <p>Referent group: Person with out disease or injury in past 2 wks and willing to participate</p>	<p>Demographic interview</p> <p>WHOQOL-BREF has 4 Components: 1. physical 2. psychological 3. social relationship 4. environment Reliability = .86</p> <p>Time Trade Off</p>	<p>Descriptive Statistics t-test ANOVA Multiple Comparison by Tukey's t-test and Dunnet T 3 Multiple Regression by stepwise multiple regression</p>	<p>Measured by WHOQOL- BREF - The overall QOL of patients with CAD was significantly poor than that of the normal reference group (p < .001) - Variables that were associated with QOL included enough income, symptoms, severity, family income, age and occupation.</p> <p>Measured by Time Trade Off The variables found to be associated with QOL were co- morbidity, dyspnea, and income.</p> <p>The mean of QALYs lost was highest in younger patients (≤ 40 yrs) and lowest in older patients (> 70 yrs), as measured by WHOQOL- BREF and Time Trade Off.</p>

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
2001 M. Pornpimol	Comparison of QOL in CAD patients between before and three months after CABG. Prospective descriptive research	CABG Hypothesis: QOL of CAD patients undergoing CABG is better in certain dimensions of physical , psychosocial and independent and overall three months after the operation than before.	QOL	Purposive Sampling 40 CAD patients underwent CABG	- Interview Demographic Questionnaire - Jenkin Activity Survey (JAS) Reliability $\alpha = .72$ - Sickness Impact Profile (SIP) Developed Bergner Reliability $\alpha = .81, .79$ for pre and post operative period	Descriptive Statistics Paired t-test for comparison of QOL in CAD patients between before and after CABG. McNemar test for compare the health status between before and three months after the operation	Most participants were male, aged from 60- 80 yrs, and unemployed. Triple vessel disease Functional level III and frequent chest pain. According to the SIP scores, the QOL of CAD patients before CABG were poor overall and poor in three dimension: physical, psychological, and independent. At three months after CABG, almost all patients (except 1) were working in there previous job. A majority of the sample had functional status II and a small number had chest pain . The QOL was improved significantly ($p < .001$) overall and three dimensions. However, they were still dysfunctional condition.

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
1999 R. Jittawadee	Effects of Nursing care based on Theory of Goal Attainment on Activity of Daily Living and Life Satisfaction in elderly patients with MI Purpose: To determine the effects of Nursing care based on Theory of Goal Attainment on Activity of Daily Living and Life Satisfaction in elderly patients with MI	Nursing care based on Theory of Goal Attainment (King's Theory) Hypothesis: 1. Elderly MI patients received Nursing care based on Theory of Goal Attainment can increase ADL more than before received this program. 2. Elderly MI patients received Nursing care based on Theory of Goal Attainment can increase Life Satisfaction more than before received this program.	- Activity of Daily Living - Life Satisfaction in elderly patients with MI	Random sampling and equally divided into two groups: experimental and control group	- Demographic Data Recording form - Nursing Care Plan based on the theory of goal attainment - The instrumental Activity of Living of Barthel Reliability $\alpha = .82$ - Life Satisfaction Index of Neugarten Reliability $\alpha = .76$	- Descriptive Statistics - t-test for testing hypothesis	Both Nursing Care Plan based on the theory of goal attainment and the routine care could increase the activities of Daily living score ($p < .005$) but not in Life Satisfaction score. The mean scores of ADL and Life Satisfaction of two groups were not statistically different.

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
		<p>3. Elderly MI received Nursing care based on Theory of Goal Attainment can increase ADL more than patients received routine care Routine care</p> <p>4. Elderly MI received Nursing care based on Theory of Goal Attainment can increase LS more than patients received routine care.</p>					

Table2. (Continue)

Year	Title	Independent Variables	Dependent Variable	Sample	Instruments	Statistics	Results
2003 S. Aem- Om	<p>The effects of a Self Care Promotion Program on QOL and reduction of Risk Factors of CHD patients.</p> <p>Objectives: 1. To compare difference in mean of body weight of subject in the experimental group and control group for the base line to 4 months F/U. 2. To compare difference in mean of LDL of subject in the experimental group and control group for the base line to 4 months. 3. To compare difference in mean of QOL of subject in the experimental group and control group for the base line to 4 months.</p> <p>Randomized clinical trial design</p> <p>Framework: - Orem's self care Theory - Ferrans and Powers' QOL</p>	<p>a Self Care Promotion Program</p> <p>Hypothesis: 1. Persons participated in the program plus usual care will have a greater decrease in : body weight, and serum LDL from the baseline to 4 months F/U ,compared with persons received usual care only. 2. Persons participated in the program plus usual care will have a greater increase QOL from the baseline to 4 months F/U ,compared with persons received usual care only.</p>	<p>QOL and reduction of Risk Factors of CHD patients.</p>	<p>Purposive Sampling Inclusion criteria : 1. CAD patient with at least one vessel stenosis 50% 2. Age 20- 70 yrs 3. stopped smoking for at least 1 year 4. LDL was 100-189 mg/dl 5. Triglyceride was less than 500mg/dl 6. over weight</p> <p>Sample size , calculated by power analysis: Significance = .05 Effect size = 1. 0 Power =. 80 Sample size = 17</p>	<p>A Self Care Promotion Program: - Videotape - Relaxation and imagery cassettes - Booklets and pamphlets - Food postcard</p> <p>Demographic data collection form</p> <p>The health status collection form</p> <p>The QOL index Cardiac IV version developed by Ferrans and Powers Reliability $\alpha = .77, .79$</p>	<p>- Descriptive Statistics - Independent t-test for testing hypothesis</p>	<p>The mean body weight in the experimental group decreased significantly compared with the control group ($p < .05$). LDL and QOL remained unchanged ($p > .05$).</p>

From Table2, it was concluded that ten researches about quality of life in Thai patients with coronary disease and myocardial infarction were used various theoretical bases of quality of life to find patient's quality of life in vary situations such as elderly; before and after interventions or nursing intervention, factors influenced QOL. The theoretical bases were Burckhardt QOL model, Neugarten, Ferrans & Powers, Zhans's model, Bergner, and WHOQOL.

The third section

Measurement of Quality of life

Measurement consists of rules for assigning symbols to objects to numerically represent quantities of attributes. Measurement includes evaluating numbers so that they reflect the differing degrees of the attributes being assessed (DeVellis, 1991, Nunnally & Bernstein, 1994) Measurement is not limited to physical quantities and relations but can extend to the quantification of a magnitude of any kind. In the social sciences and other fields such as health, biology, they use instruments such as questionnaires and assessments to compare between persons. The field of psychometrics is concerned with the theory and technique of the measurement of psychological and mental phenomena. Measurement of many quantities is very difficult and prone to large error. Part of the difficulty is due to uncertainty and part of it is due to the limited time available in which to make the measurement. QOL is a phenomenon which needs to be measured precisely.

Measures of HRQOL can be classified as either generic or condition specific. Generic measures are designed to assess HRQL in a broad range of populations and health states. They are multidimensional and usually address at least the domains of physical, social, and emotional functioning; perceived health status; and life

satisfaction. Examples of such measures include the Sickness Impact Profile (Bergner, et al., 1981), the Rand-36 Health Status Profile (Hays, et al., 1993), and the Quality of Well-being Scale (Bush, et al., 1984).

When measuring HRQL it is important that the instrument selected measures the health dimensions relevant to that particular set of patients (Wilson & Cleary 1995; McDowell, and Newell: 1996). For instance, an instrument intended for use with patients after myocardial infarction (MI) should take into account the individual's responses to living with the disease, in terms of recreational, occupational, social, personal and sexual relationships, as well as the acute and chronic physical consequences of the disease (Guyatt, & Feeny, et al., 1993). This is because when someone becomes ill almost all aspects of his or her life may be affected (Bowling, 1997). The measurement of quality of life should be done by the patients and not the health profession because what constitutes quality of life is a personal and individual question (Slevin, et al., 1988).

HRQL instruments are either "generic" or "disease-specific". Generic instruments address multiple aspects of quality of life across a range of different patient or disease groups. Thus, they focus on general issues of health (or ill health) rather than specific features of a particular disease. Disease-specific instruments comprise content specific to the disease in question they are more clinically sensitive and potentially more responsive in detecting change. Each type has its own particular strengths and weaknesses, so that there are some merits in combining both generic instrument and specific instruments to develop an effective and efficient QOL instrument.

1. Generic Instruments

Generic measures are multidimensional and usually address at least the domains of physical social and emotional functioning: perceived health status; and life satisfaction. A number of generic instruments are commonly used in research and clinical evaluation in populations with coronary heart disease (CHD). The two most commonly used ones are the Sickness Impact Profile (Bergner, Bobbitt, Carter, and Gilson, 1981) and the Medical Outcomes Study 36-Item Short Form Health Survey (Visser, Fletcher, Parr, and Simpson, 1994).

Sickness Impact Profile (SIP)

The SIP (Bergner, 1981) comprises 136 items relating to 12 'domains' of health (mobility, ambulation, domestic affairs, social interaction, behavior, communication, recreation, eating, work, sleep, emotions and self-care). It is thus a broadly applicable instrument that measures a variety of health outcomes, including serial changes in wellbeing over time. The SIP can be interviewer-or self-administered and offers a comprehensive means of assessing wellbeing, but its relatively long length can be a disadvantage. However, it has been recommended as an appropriate generic measure in angina and MI patients (Visser, 1995).

Medical Outcomes Study 36-Item Short Form Health Survey (SF-36)

The SF-36 (Ware, Snow, Kosinski, and Gandek, 1993) comprises 36 items covering eight 'domains' (physical functioning, social functioning, physical impairment, emotional impairment, emotions, vitality, pain and global health). The SF-36 is a self-administered instrument which takes about 15 minutes to complete. In patients with recent MI, SF-36 has been shown to be a sensitive tool for detecting improvement of HRQL after active intervention (Chau, et al, 1999; Yu CM, et al, 2003).

2. Disease specific Instruments

A number of instruments have been designed to examine specifically the impact of angina, MI or heart failure on quality of life. Examples include the Seattle Angina Questionnaire (Spertus, 1995), the Quality of Life after Myocardial Infarction (Oldridge, 1991; Guyatt, & Hillers, 1993; Guyatt, et al.,1994) questionnaire (now called the MacNew (Hays & Anderson,1998) questionnaire) and Minnesota Living with Heart Failure (Dougherty, et al.,1998) questionnaire.

2.1 Seattle Angina Questionnaire (SAQ)

The SAQ (Spertus, 1995) is a psychometrically solid disease-specific instrument designed to assess the functional status of patients with angina. It comprises 19 questions that quantify five clinically relevant domains: physical limitation, anginal stability, anginal frequency, treatment satisfaction and disease perception/quality of life. It is often used as a HRQL instrument because seven of its 19 items relate to emotional health.

2.2 Quality of Life after Myocardial Infarction (QLMI/MacNew) questionnaire

The original version of the QLMI (Oldridge, 1991; Guyatt, 1993) was designed to be interview-administered and developed to evaluate the effectiveness of a comprehensive cardiac rehabilitation program. A slightly modified 26-item self-administered version has been used (Lim, 1993; Hillers, 1994). This questionnaire has been validated (Hillers TK, 1994, Hays RD, 1998). More recently, an improved 27-item version of the instrument, the MacNew heart disease questionnaire (sometimes known as the QLMI-2) has been reported (Valenti, 1996). A good deal of research is being conducted with this instrument and reference data for users is now available (Dixon, 2002).

2.3 Myocardial Infarction Dimensional Assessment Scale (MIDAS)

The MIDAS (Thompson DR, 2002) is an interviewer-or self-administered questionnaire that comprised 35 items covering seven areas of health status (physical activity, insecurity, emotional reaction, dependency, diet, concerns over medications and side effects). The instrument had only recently been developed and validated in the UK and further research on its utility is being conducted.

From literature review of studies related to the quality of life in patients with coronary artery disease and myocardial infarction, the quality of life instruments and their psychometric properties were presented in Table3.

Table3. The Quality of Life Instruments Used in Thai Patients with Coronary Disease and MI

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>Burckhardt's QOL scale composed of 3 instruments</p> <p>1. Life Satisfaction Index (LSI-Z) of Wood, et al for general life</p> <p>2. Domain satisfaction Rating Scale of Flanagan</p>	<p>The result of human and environment interaction in the form of life satisfaction. Using cognitive framework of Lazarus.</p> <p>LSI- Index developed from the life satisfaction Rating of Neugarten</p> <p>well -being in 5 domains: - physical well-being and factors in living, - relationship with others - social activity - self development and satisfaction - resting</p>	<p>meaning of score, Psychometric Property</p> <p>13 items rating scale 3 levels: agree, not sure, not agree agree = feeling the same as in that statement about the way of life not sure = unable to decided that the statement means the same as his feeling not agree = this statement does not have the same meaning as his feeling score criteria: 2, 1, 0 for positive question 0, 1, 2 for negative question, range of score= 0-26</p> <p>Content valid by two expertnurses Reliability by Cronbach Alpha Coefficient = 0.75</p> <p>16 items (15 original + sex relationship = 16) rating scale 8 levels, range of score = 0-112 very much satisfied = feel very much satisfied = 7 points much satisfied = feel much satisfied = 6 points little satisfied = feel little satisfied = 5 points fair = no feeling of satisfaction or dissatisfaction = 4 points little dissatisfied = feeling little dissatisfied = 3 points much unsatisfied = feeling much unsatisfied = 2 points very much unsatisfied = feeling very much unsatisfied = 1 point no interest = no interest or not think about it = 0</p> <p>Content valid by two expertnurses Reliability by Cronbach Alpha Coefficient = 0.89</p>	<p>1987 R. prapa</p> <p>1990 J. Chutwalai</p>

Table3. (continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>3. Overall QOL Rating</p> <p>Life Satisfaction Questionnaire by Ferran & Powers</p>	<p>subjective self assessment of QOL</p> <p>* scores of QOL are the sum of scores from these three instruments</p> <p>QOL is the satisfaction of life and ones environment, and the happiness from ones satisfaction or dissatisfaction in different important aspects of ones life. The aspects are : satisfaction in family, marital status, sexual relationship, feelings of other people to oneself, social life, hobby, work, finances, friends, decreasing of symptoms and physical functions.</p>	<p>1 item, in conclusion , how about your overall QOL? rating scale 5 levels very poor = their QOL is very poor = 1 point poor = their QOL is poor = 2 points</p> <p>medium = their QOL is fair = 3 points good = their QOL is good = 4 points very good = their QOL is very good = 5 points</p> <p>Origin -----It is composed of two parts: - life satisfaction - the importance of satisfaction for each item. each part is divided into four sections: health and function 11 items, Socioeconomic 9 items, psycho-spirituality 8 items, family 4 items. Total sum = 32 items---for healthy person = 36 items ---for heart disease patients</p> <p>6 point Likert type scale, score is 1 to 6 1 point = unsatisfied or not important 6 points = very much satisfied or very important</p> <p>validity: content , criterion related validity, and construct validity Reliability by test - retest , correlation coefficient = .87 for graduate students .81 for hemodialysis patients Internal consistency by alpha cronbach's coefficient = .93 for graduate student = .90 for hemodialysis patients</p> <p>Thai: J. tassanee used in CRFwith PPD Reliability, alpha cronbach's coefficient = .95</p>	<p>1996 K. Kusuma</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>Functional capacity questionnaire by Shabetai</p>		<p>and for each domain were .82, .82, .89, and .93 K. Kusuma used with heart disease patients Validity for content and language by three experts in caring patients with CABG (2 doctors and 3 nurses) Reliability for internal consistency by alpha cronbach's coefficient = .71 from 30 samples and = .88 from 100 samples and for each domain were .72, .72, .69, and .55</p> <p>Shabetai developed 28 items used with cardiomyopathy patient Faris & Stotts readjust this Functional capacity questionnaire to be 31 items and used with CABG patients Reliability by apha cronbach's coefficient = .82</p> <p>K. Kusuma readjust and validate content and language by five experts (two doctors and three nurses) 31 multiple choices for patients with chest pain and 19 multiple choices for patients with out chest pain</p> <p>Reliability by apha cronbach's coefficient = .93 for 30 samples, and .89 for 100 samples</p>	<p>1996 Kusuma</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>QOL interviewal form developed by H. Somphan under conceptual framework of Zhan's QOL</p>	<p>Zhan's QOL assesses through physical, psychosocial, and including four domains: Life satisfaction, Self Concept, Health and Functioning, and Social Economic Assess both subjective and objective QOL</p>	<p>Interviewal form, 40 items: Life satisfaction = 10 items about satisfaction in present conditions, -Life satisfaction = 10 items about satisfaction in present conditions, treatment, way of living, successful life -Self Concept = 10 items about health status, personality, self value, religious belief -Health and Functioning = 10 items about illness, functional capacity such as ADL, self care, exercise, sexual relationship, and routine activity. -Social Economic = 10 items about relationships in family, and friends such as social activity, education, and occupation</p> <p>Rating scales five levels: Very much = statement corresponds with patient's thinking and feelings in everything Quite a bit = statement corresponds with patient's thinking and feelings in majority Somewhat = statement corresponds and does not correspond with patient's thinking and feelings with nearly each one. A little bit = statement corresponds with patient's thinking and feeling in minority Not at all = statement does not correspond with patient's thinking and feelings</p> <p>Score means: Very much = 4 points for positive statement, = 0 for negative statement Quite a bit = 3 points for positive statement, = 1 for negative statement Somewhat = 2 points for positive statement, = 2 for negative statement A little bit = 1 point for positive statement, = 3 for negative statement Not at all = statement does not correspond with patient's thinking and feelings</p>	<p>1997 J. Saifon A. Prissana</p>

Table3. (continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>QOL interviewal form developed by H. Somphan under conceptual framework of Zhan's QOL</p>		<p>Range of scores in general QOL is 0-160</p> <p>Meaning of score:</p> <ul style="list-style-type: none"> - Low score = poor QOL in general QOL - High score = good QOL in general QOL <p>Criteria of QOL mean scores in general:</p> <p>Range of mean score in general QOL</p> <ul style="list-style-type: none"> 0-59 = Poor QOL in generally 60-99 = Fair QOL in generally 100-160 = Good QOL in generally <p>Range of mean score in each domain of QOL is 0-40</p> <p>Meaning of score:</p> <ul style="list-style-type: none"> - Low score = poor QOL in each domain of QOL - High score = good QOL in each domain of QOL <p>Criteria of QOL mean scores in each domain:</p> <p>Range of mean score in each domain of QOL</p> <ul style="list-style-type: none"> 0-14 = Poor QOL in each domain of QOL 15-24 = Medium QOL in each domain of QOL 25-40 = Good QOL in each domain of QOL <p>Range of mean score in each item of QOL is 0-4</p> <p>Meaning of score:</p> <ul style="list-style-type: none"> - Low score = little satisfaction in each item of QOL - High score = much satisfaction in each item of QOL 	<p>1997</p> <p>J. Saifon</p> <p>A. Prissana</p>

Table3. (continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>Sickness Impact Profile (SIP) by Bergner</p>	<p>QOL in the concept of health status or functional status which was effected by sickness and Treatment. Proposed concept by Bergner.</p> <p>QOL means Health Status or functional capacity</p> <p>Health Status or good Ability in different Functional Role shows good QOL</p> <p>Health status and sickness effects behavior and functional role of person.</p> <p>Sickness shows the personal experiences</p>	<p>Criteria of QOL mean scores in each item Range of mean score in each item of QOL</p> <p style="padding-left: 40px;">0-1.4 = little satisfaction in each item 1.5-2.4 = medium satisfaction in each item 2.5-4.0 = much satisfaction in each item</p> <p>Validity : Validation content and language by six experts (1 doctor, 1 Sociology teacher, and 4 nursing teachers</p> <p>Reliability: Cronbach's alpha coefficient = 0.88 (J. Saifon) = 0.84 (A. Prissana)</p> <p>Assessment Health Status and Functional Status</p> <p>SIP composed of 136 items, divided into 12 aspects and 3 dimensions: - physical dimension has three aspects such as physical care and movement 23 items, transference 10 items, and body mobilization 12 items - psychosocial dimension has four aspects such as communication 9 items, emotional behaviors 9 items, social interactions 20 items and alert behaviors 10 items - general dimension has five aspects such as working 9 items, home management 10 items, eating food 9 items, recreation and leisure time 8 items and sleeping 7 items.</p>	<p>1998 P. Somchit</p> <p>1998 P. Penroong</p> <p>2001 M. Pornpimol</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
Sickness Impact Profile (SIP) by Bergner	about illness and perceived it from ability of ADL, role function, changes in behavior, feeling, and personal attitude.	<p>total sum of scores from 136 items in 3 dimensions and 12 aspects</p> <ul style="list-style-type: none"> - high scores = much impact from sickness or lots of dysfunctions which reflect poor QOL - low scores = little dysfunction which reflects good QOL <p>Validity:</p> <ul style="list-style-type: none"> - content validity done by using four experts in heart disease <p>Reliability: cronbach's alpha coefficient of overall QOL =.95 cronbach's alpha coefficient of physical dimension =.94 cronbach's alpha coefficient of psychosocial dimension =.84 cronbach's alpha coefficient of general dimension =.88 (sample size = 12 patients with PTCA)</p> <p>Reliability: cronbach's alpha coefficient of overall QOL =.74-.87 cronbach's alpha coefficient of physical dimension =.70-.76 cronbach's alpha coefficient of psychosocial dimension =.52-.72 cronbach's alpha coefficient of general dimension =.45-.71 (sample size = 35 patients with PTCA, assess before and after PTCA)</p> <p>P.Penroong ,1998</p> <p>Validity:</p> <p>content validity done by using five experts (1 foreign language, 2 doctors, and 2 nurses experted in CAD</p> <p>Reliability: cronbach's alpha coefficient of overall QOL = .95, .76, .93, .95 cronbach's alpha coefficient of physical dimension = .91, .43, .91, .85 cronbach's alpha coefficient of psychosocial dimension = .93, .94, .87, .92</p>	<p>1998 P. Somchit</p> <p>1998 P. Penroong</p> <p>2001 M. Pompimol</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>The short form 36- Health Survey (SF-36)</p>	<p>Health related quality of life means value of life time changed by sickness. Physical function, thinking and social opportunity effected by disease, trauma, treatment, and health care policy.</p> <p>Health related QOL (HRQOL) is the well known index to measure the impact of sickness or effect from treatment to patients' life.</p> <p>The short form 36- Health Survey was used to measuer general HRQOL. SF-36 composed of 8 domains: Physical Function, Role limitation due to physical health problems, Pain, Social functioning, General mental health, Role limitation due to emotional problems, Vitality, General health perception.</p>	<p>cronbach's alpha coefficient of general dimension = .72, .73, .74, .88 (sample size = 35 patients with PTCA, assess before and after PTCA 2 wks, 6 wks, and 3 months)</p> <p>The short form 36- Health Survey was used to measuer general HRQOL.</p> <p>SF-36 composed of 8 domains: Physical Function, Role limitation due to physical health problems, Pain, Social functioning, General mental health, Role limitation due to emotional problems, Vitality, and General health perception</p> <p>36 items rating scale, each domain has different levels</p> <p>Validity : has not been done but used the evidence from the literature</p> <p>Reliability : Cronbach's alpha coefficient is 0.9461</p>	<p>1998 L.Siriporn</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year								
<p>Life Satisfaction Index A: (LSIA) by Neugarten which was adjusted and translated in Thai by K. Srireun</p>	<p>Neugarten defined Life Satisfaction as a sense of happiness , gratification, self-esteem, self satisfaction, acceptance of life success or failure , good attitude to oneself, others, society and the world.</p> <p>Life Satisfaction is the sign of psychological well-being and good QOL.</p> <p>Neugarten's Life Satisfaction composed of five components: zest, resolution and fortitude, congruence between desired and achieved goals, positive self concept and mood tone.</p>	<p>LSIA is applied specifically to elderly</p> <p>LSIA has 4 components, 18 questions, multiple choices:</p> <ul style="list-style-type: none"> - mood tone has 6 questions about sense of happiness, present life satisfaction or life discouragement. - zest has 6 questions about interests, planning, prospects of activities done at present time or in future, acceptance of oneself and self image - the congruence between desired and achieved goals has 3 questions about thinking and feeling about the past. - resolution and fortitude has 3 questions about attitude to contend and endurance in ones life <p>Criteria of the answer:</p> <ul style="list-style-type: none"> - true means the statement corresponds to the feelings of the one answered. - not true means the statement does not correspond to the feelings of the one answered. - not sure means the statement corresponds to the feelings of the one answered sometimes <p>Scoring:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Positive question</td> <td style="width: 50%;">Negative question</td> </tr> <tr> <td style="padding-left: 20px;">true = 3 points</td> <td style="padding-left: 20px;">true = 1 point</td> </tr> <tr> <td style="padding-left: 20px;">not sure = 2 points</td> <td style="padding-left: 20px;">not true = 2 points</td> </tr> <tr> <td style="padding-left: 20px;">not true = 1 point</td> <td style="padding-left: 20px;">not true = 3 points</td> </tr> </table> <p>Validity: using report from the literature review</p> <p>Reliability: Cronbach's alpha coefficient = .75 from 10 samples (Try out) = .76 from 20 samples</p>	Positive question	Negative question	true = 3 points	true = 1 point	not sure = 2 points	not true = 2 points	not true = 1 point	not true = 3 points	<p>1999 R.Jittawadee</p>
Positive question	Negative question										
true = 3 points	true = 1 point										
not sure = 2 points	not true = 2 points										
not true = 1 point	not true = 3 points										

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
WHOQOL-BREF	<p>QOL is personal perception under the roles of culture, value, life goal, expectation, standards, and other people which is the complex result of physical health, mental health, level of independence, social relationships, environment, and self confidence.</p> <p>WHOQOL-BREF is the short form of WHOQOL-100. It can be applied to every culture and emphasizes the personal perception of well-being and progression of treatment.</p>	<p>WHOQOL-BREF composes of four domains, 26 questions:</p> <ol style="list-style-type: none"> 1. Physical and level of independence domain is the physical perception of the person effected by daily life and divided into 7 sub-domains: <ul style="list-style-type: none"> - pain and comfort - energy and fatigue - sleep and rest - mobility - activity of daily living - dependence on medication of treatment - working capacity 2. Psychological domain is the psychological perception of person and divided into 6 sub-domains: <ul style="list-style-type: none"> - positive feelings - thinking, learning, memory, and concentration - self esteem - body image and appearance - negative feeling - spirituality, religion, personal beliefs 3. Social relationship domain is the perception of relationship between oneself and others, perception of receiving help from other peoples in society, including the perception of giving help to other persons in society and divided into 3 sub-domains: <ul style="list-style-type: none"> - personal relationships - social support - sexual activity 4. Environmental domain is the perception about the environmental effect on life style and is divided into 8 sub-domains: <ul style="list-style-type: none"> - physical safety and security 	<p>1999 Y. Monsin</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year																		
WHOQOL-BREF		<ul style="list-style-type: none"> - home environment - financial resource - health and social care: availability - opportunities for acquiring information and skills - participation in and opportunities for recreation and leisure - physical environment - transport <p>Rating scale, 5 levels</p> <p>1 = you do not have that feeling, much dissatisfaction, or feeling worst</p> <p>2 = you have that feeling rarely, little feeling like that, unsatisfied or feeling worse</p> <p>3 = you have that feeling moderately, medium satisfaction, or feeling bad</p> <p>4 = you often have that feeling, more feelings like that, satisfied or feeling good</p> <p>5 = you always have that feeling, much more feelings like that, feel perfect, much satisfaction or feeling very good</p> <p>Scoring:</p> <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Number</th> <th style="text-align: left;">positive statement</th> <th style="text-align: left;">Negative statement</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>1</td> </tr> <tr> <td>2</td> <td>4</td> <td>2</td> </tr> <tr> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>2</td> <td>4</td> </tr> <tr> <td>5</td> <td>1</td> <td>5</td> </tr> </tbody> </table>	Number	positive statement	Negative statement	1	5	1	2	4	2	3	3	3	4	2	4	5	1	5	<p>1999</p> <p>Y. Monsin</p>
Number	positive statement	Negative statement																			
1	5	1																			
2	4	2																			
3	3	3																			
4	2	4																			
5	1	5																			

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year																		
		<p>Criteria of level of QOL</p> <table border="0"> <tr> <td>Range of Scores</td> <td></td> <td>meaning</td> </tr> <tr> <td>0 - 20</td> <td>=</td> <td>overall QOL is very low.</td> </tr> <tr> <td>21 - 40</td> <td>=</td> <td>overall QOL is low.</td> </tr> <tr> <td>41 - 60</td> <td>=</td> <td>overall QOL is medium.</td> </tr> <tr> <td>61 - 80</td> <td>=</td> <td>overall QOL is good.</td> </tr> <tr> <td>81 - 100</td> <td>=</td> <td>overall QOL is very good.</td> </tr> </table> <p>Validity: using report from the literature review</p> <p>Reliability: Cronbach's alpha coefficient = .86 from 30 samples</p>	Range of Scores		meaning	0 - 20	=	overall QOL is very low.	21 - 40	=	overall QOL is low.	41 - 60	=	overall QOL is medium.	61 - 80	=	overall QOL is good.	81 - 100	=	overall QOL is very good.	
Range of Scores		meaning																			
0 - 20	=	overall QOL is very low.																			
21 - 40	=	overall QOL is low.																			
41 - 60	=	overall QOL is medium.																			
61 - 80	=	overall QOL is good.																			
81 - 100	=	overall QOL is very good.																			

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	year
<p>Time Trade Off (TTO) by Torrance</p>	<p>TTO is one of three techniques of utility measure of QOL. Utility measure is the economic assessment of QOL , by setting up QOL Index be vary between good health = 1 and death = 0 but it can'tshow QOL in each domain.</p> <p>TTO assess the QOL of a patient by giving two choices to choose from: First , present health status with chronic illness in life time duration (t) which remains according to the limit of life. Second, The duration (x) of shortening life time with good health . Asking these two Questions to the samples until there is no difference of ideas between the samples.</p>	<p>TTO assesses QOL of patient by giving two choices to choose from: First , present health status with chronic illness in life time duration (t) which remains according to the limit of life. Second, The duration (x) of shortening life time with good health. Asking these two Questions to the samples until no difference of ideas from the samples.</p> <p>Score Calculation: QOL scores = x/t</p> <p>Range of QOL scores = 0 - 1 Overall QOL scores = 0 - 100 and using the same criteria of the levels of QOL as WHOQOL- BREF</p>	<p>1999 Y. Monsin</p>
<p>Sickness Impact Profile (SIP) developed by Bergner</p>	<p>Bergner's conceptual framework.</p> <p>QOL is strongly associated with health status and functional status. So QOL can be measured by changes of health and/or functional status, which occur all the time during treatment and diagnosis.</p> <p>When signs and symptoms appeared, the patients then perceive their sickness. Sickness is an individual's own perception of health and changes in behavior related to carrying out daily life activities. In addition, the process of the diagnosis and treatment also hinder them from doing normal activities. The outcome of the impact</p>	<p>SIP is a measurement of health status that could be assessed individually or by population with chronic or acute illness. SIP assesses the impact of illnesses on changing daily activities and behaviors. SIP was designed to be broadly used across various types and severity of illnesses.</p> <p>SIP consists of 136 items grouped into 12 categories and 3 dimensions. These are physical, psychosocial, and independent dimensions.</p> <ul style="list-style-type: none"> - Physical dimension includes 3 categories with 45 items: ambulation 12 items, mobility 10 items, and body care and movement 23 items. - psychosocial dimension includes 4 categories with 48 items: social interaction 20 items, alertness behavior 10 items, emotional behavior 9 items, and communication 9 items. 	<p>2001 M. Pompimol</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	
	<p>of the sickness is measured as individual dysfunction.</p>	<p>- Independent dimension includes 5 categories with 43 items: sleep and rest 7 items, eating 9 items, home management 10 items, and recreation and pastimes 8 items.</p> <p>Scaling and scoring: High score in each item from each patient response to the SIP statement indicated greater dysfunction or low QOL. Possible scores range from 0 - 100 that related to the severity of dysfunction of each statement and category.</p> <p>Validity: Content Validity: The statements describing sickness-related behavior dysfunction were obtained from individuals who were involved directly or indirectly in sickness episodes and from a review of the literature. From 312 items to be 136 items in the final.</p> <p>Criterion Related Validity: (Bergner, 1976) The correlation between SIP score and Self Assessment of dysfunction was .69, between the SIP score and The NHIS (National Health Interview Survey) Index was .55, between The SIP score and The Clinical Assessment of Sickness was .40</p> <p>Reliability: From literature review, alpha coefficient were: .94 from 35 samples in 6 month after CABG (Rekeder, 1995) .65 in body movement scale, .56 in sleep and rest, .81 body care and movement, .59 home management, .65 social interaction, and .53 in recreation and pastime from 185 post CABG patients. (Artinen & Duggan,1995)</p>	<p>2001 M. Pornpimol</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale,	
		<p>In Thailand: Physical Function = .94, Psychosocial = .84, Independent dimension = .88 and Overall QOL = .95 (from 12 samples, P. Somjit, 1998)</p> <p>Physical dimension of before, 2 wks, 6 wks and 3 months = .70-.76 Psychosocial dimension of before, 2 wks, 6 wks and 3 months = .52-.72 Independent dimension before, 2 wks, 6 wks and 3 months = .45 - .71 Overall dimension of before, 2 wks, 6 wks and 3 months = .74, .77, .75, and .87 (from 35 samples, P. Somjit, 1998)</p> <p>Physical Function = .91, Psychosocial = .93, Independent dimension = .72 and Overall QOL = .95 (from 35 samples before procedure, P. Penroong, 1998)</p> <p>Physical dimension after the procedure 2 wks, 6 wks, 3 months = .45, .91, .83 Psychosocial dimension after the procedure 2 wks, 6 wks, 3 months = .94, .87, .92 Independent dimension after the procedure 2 wks, 6 wks, 3 months = .73, .74, .88 Overall dimension after the procedure 2 wks, 6 wks, 3 months = .76, .93, .95 (from 35 samples, P. Penroong, 1998)</p> <p>Physical dimension before and after CABG 3 months = .70, .64 Psychosocial dimension before and after CABG 3 months = .79, .67 Independent dimension before and after CABG 3 months = .60, .50 Overall dimension before and after CABG 3 months = .81, .79</p>	<p>2001 M. Pornpimol</p>

Table3. (Continue)

Instrument	Theoretical base of Instrument	Characteristic of Instrument: items, scale	Year
<p>The QOL Index - Cardiac IV version developed by Ferran & Powers, 1998.</p> <p>The QOL Index - Cardiac IV version developed by Ferran & Powers, 1998.</p>	<p>The development of Ferrans conceptual model of QOL was based on the adoption of an individualistic ideology, which recognizes that QOL depends on the unique experiences of life for each person.</p> <p>Four domains of QOL are: health and functioning psychological / spiritual, social and economic, and family.</p> <p>Thai version of QOL Index- cardiac version-IV Ferrans& Powers, 1998) that developed from QOL Index- Cardiac version-III by Ferran to assess the effects a self care program</p>	<p>(from 3 samples , M. Pomoimol, 2001)</p> <p>QOL Index measures QOL in terms of satisfaction with life. 70 items, in two parts: satisfaction 35 items and importance 35 items health and functioning = 15 items, psychological / spiritual = 7 items, social and economic = 8 items, and family = 5 items.</p> <p>A six-point Likert rating scale Scoring: Very dissatisfied / Very unimportant = 1 Moderately dissatisfied / Moderately unimportant = 2 Slightly dissatisfied / Slightly unimportant = 3 Slightly satisfied / Slightly important = 4 Moderately satisfied / Moderately important = 5 Very satisfied / Very important = 6</p> <p>Validity : The instrument was translated into Thai by research. The translation was verified using the back- translation procedure, by which the Thai version was back translated into English by another translator. Content validity of Thai -version was established by 5 experts: 3 instructors with cardiovascular experience, 1 cardiovascular clinical nurse specialist and 1 professor of nursing science. Content validity index of QOL Index - Cardiac IV version = 1.0 where a CVI of more than .8 was good (Cohen,1999)</p> <p>Reliability: alpha coefficient was .77 (pilot study, 50 samples) alpha coefficient was .79 (34 samples for the study)</p>	<p>2003 S. Aem-orn</p>

From Table3, there presented many instruments used to measure quality of life in CAD and MI patients. They were generic, specific instrument, and they were multidimensional instruments measured subjective quality of life such as life satisfactions, well-being about health status in the four main components as: physical, psychological, social, family. Content validity of the instruments was validated by experts. Reliability ranged from 0.7-0.95. All instruments were developed from Western countries but there was no instrument developed from Thai patients who had different in culture. The development of QOL instrument in Thai patients with post MI was interested.

In conclusion, QOL can be measured by using the instrument. There are both generic and specific instruments and which one can be used depends on the objective of the research and the focus of interest in the issues. In order to develop the new instrument, there have been some procedures used to guide the instrument's development.

The other thing which has an affect on the quality of life and must be of concern is the culture of the patients' living place or environment. In this research the culture of the patients' living place is Thai culture.

Culture and quality of life measurement

The existing quality of life questionnaires used in Thailand were developed in English-speaking countries. Even then, there was an element of amazement expressed when the instruments designed on different continents and validated in different places seemed similar in content. Subsequently, the use of these techniques and tools has been extended both to different language groups within the broad Western cultural tradition and more recently to parts of the world where the social and cultural ethos is

totally different (Kleinman, 1986; Marshall, 1990). The differences in illness behavior merely reflects different culturally learned styles of coping with the world at large. Cultural patterns might vary, depending on the social context (Scamber, 2003).

Western people are individualist but Asian people are collectivist. Asian emphasis is on the family connections and clans much more than Westerners, where groups include non-family members around work or clubs. The American social clock had a longer period of relative independence, that is adulthood started earlier and retirement started later than among Asians. Vatuk's study of a district in Delhi showed that many old people feel that they have a right to give up burdens and assume dependency on their families, especially the oldest son, if they wish (Vatuk, 1980). Dominant American culture with its emphasis on action and youthfulness endorses this view. American retirement centers are known for organized activities to keep people busy. Notice the proclivity of elders for trips and cruises. Travel is perhaps the world's largest industry (Sundberg, & Fry, 1997). Hindus deem some withdrawal as appropriate and important for people in the last part of life --a retreat from the responsibilities of middle adulthood. Buddhist beliefs also point to detachment through acceptance and meditation as ways to deal with the inevitable suffering of life. Dominant American culture with its emphasis on action and youthfulness endorses this view.

Religious beliefs are of value in coping with the inevitable losses and difficulties of the life span, especially late in life when health problems increase and friends and relatives die. Koenig and his associates (1988) found that religious practices, such as prayer and church attendance, were helpful in coping with life problems and the approach of death.

The information above supports that culture has influenced a person's life including perception, feeling, thinking, and behavior or practice so that people with different cultures had different perceptions, feelings, thinking, and behavior or practice too. Thai culture is different from Western culture especially family relations and social life, which is of a close relationship. Thai people are polite, good at adapting, compromising, are flexible, good helpers and supporters, and believe in Thai culture and Buddhism which guides their lives. They also have good attitude for things that happen in their lives. All these characteristic of Thai people's culture and Buddhism have influenced Thai people's QOL. If QOL is to be measured efficiently, the instrument should be suitable for Thai people who are different from Westerners (Wanitkul, 2003; Wirojratana, 2002; Praditkul- Asdornwised, U. 2000).

As currently conceived and executed, the assessment of quality of life derives from Western concepts of illness, and of man's fate. In the West, illness is almost an external intervention, adversely affecting an otherwise self-determined life-course. This is not true in many other cultures where fatalism, karma, and cultural predeterminism are essentials of the life cycle. The type of medical interventions we consider routine may be considered profound violations of the sanctity of body and soul. The fact that the roles of healer and spiritual leader are merged in many societies makes this important distinction clear. In researching Quality of life in different settings, it is essential to understand that with the approach comes the parameters and presupposition of western medicine. The development of an effective and accurate QOL instrument would demand knowledge of measurement and the instrument's development.

Conclusion

Thai culture has influenced the people's way of life so that it also influences the quality of life of the people, especially patients with myocardial infarction. This disease is a life threatening disease and disturbs a patient's life. With the different culture, the quality of life of people should be different for instance Thai culture has an extended family with close relationships of the members, respect to seniority, beliefs derived from the ancestors and the Buddhist religion. The measure of QOL in Thai patients should be concerned about all the factors influencing the quality of life.

The forth section

Instrument development

There are four steps to guide for an instrument development as follow:
(Netemeyer, Bearden, and Sharma, 2003):

Step1. Construct definition and content domain

Clearly defining the construct- its facets and domains- is an essential first step that may consider the most difficult step in the scaling process (Nunnally & Bernstein, 1994). It must be taken as to what is included in the domain of the construct and what is excluded from this domain. A measure may be too narrow and fail to include important facets of the construct. This referred to underrepresentation. If the domain is too broadly defined, extraneous factors of the construct may be included and highly correlation to the relevant domain of the construct, they create confound between the target construct and predictor and criteria variables as referred construct-irrelevant variance (Neuberg, 1997). The constructs should be grounded in a theoretical framework.

In essence, there can be no construct validity of a measure without a specified theory. This well thought through theory starts with construct conceptualization/definition based in a thorough review of the literature. This process will help researcher to know the construct as an independent or dependent variable, boundaries, dimensions, content domains, and the strengths and weaknesses of such attempts. So that, the importance of the theory in scale development cannot be overstated, and refining a theory requires a thorough literature review. During the literature review and theory development process, several issues should be stressed: 1.) the importance of a clear constructed definition, content domain, and the role of theory; 2.) a focus on effect or reflective items rather than formative indicators; and 3.) construct dimensionality- one-dimensional, multidimensional, or a higher-order construct.

Step2. Generating and judging measurement items

This step involves generating and judging a pool of items from which the scale will be derived. Several issues must be considered including the following: 1.) theoretical assumptions about items (e.g., domain sampling), 2.) generating potential items and determining the response format (i.e., how many items as an initial pool, dichotomous vs. multi-chotomous response formats, and item wording issues), 3.) the focus on content validity and its relation to theoretical dimensionality, and 4.) item judging (both expert and layperson)- the focus on content and face validity.

In generating an item pool, an important goal is systematically sample all content area of the construct. Content validity is needed and defined as the degree of which elements of an assessment instrument are relevant to an representative of the targeted construct for a particular assessment purpose. Face validity must also be considered. A highly face valid scale enhances cooperation of respondents because of

its ease to use, proper reading level, and clarity, as well as its instructions and response formats. For practical perspective, face validity may be more concern with what respondents from relevant populations infer with respect to what is being measured, and content validity is concerned with face validity as well as the researcher believes his constructing(Nunnally & Bernstein, 1994). There are no rule for the size of the initial item pool. Single facet construct will require fewer items than will complex multifaceted constructs.

Item writing is considered about: wording clarity, word redundancy, positively and negatively items, and choice of response formats. There are four common format used in measurement: Thurstone scale, Likert's scale, and Guttman scale. For the differential scale, it is used Thurstone's method which is a method to organizing the items into approximately equal appearing intervals and generating for comparisons of changes in a respondent's position on the dimension or for distinction between differences of respondents relative to the dimension (Mishel, 1998).

The summative scale, it is used Likert's method which is scaling of participants, not scaling of dimension (Mishel, 1998). It 's widely used for measuring opinion, belief, or attitude of the construct under study. Likert's scale is a rating scale which has three to seven level in scoring. The respondent's is computed by counting the number of favorite answer items.

The cumulative scale, it is used Guttman method which consists of items that are tapped to progressively higher levels of an attribute.

Semantic scale is a differential scale, typical used in reference to one or more stimuli in the case of attitude study.

Step3. Designing and conducting studies to develop and refine the scale

Once a suitable pool of items has been generated and judged, empirical testing of the items on relevant samples is the next step. Issues and procedures to be considered include 1.) pilot testing as an item-trimming procedure, 2.) the use of several samples from relevant populations for scale development, 3.) designing studies to test psychometric properties, 4.) initial item analyses via exploratory factor analyses (EFA), 5.) initial item analyses and internal consistency estimates, 6.) initial estimates of validity, and 7.) retaining items for the next set of the studies.

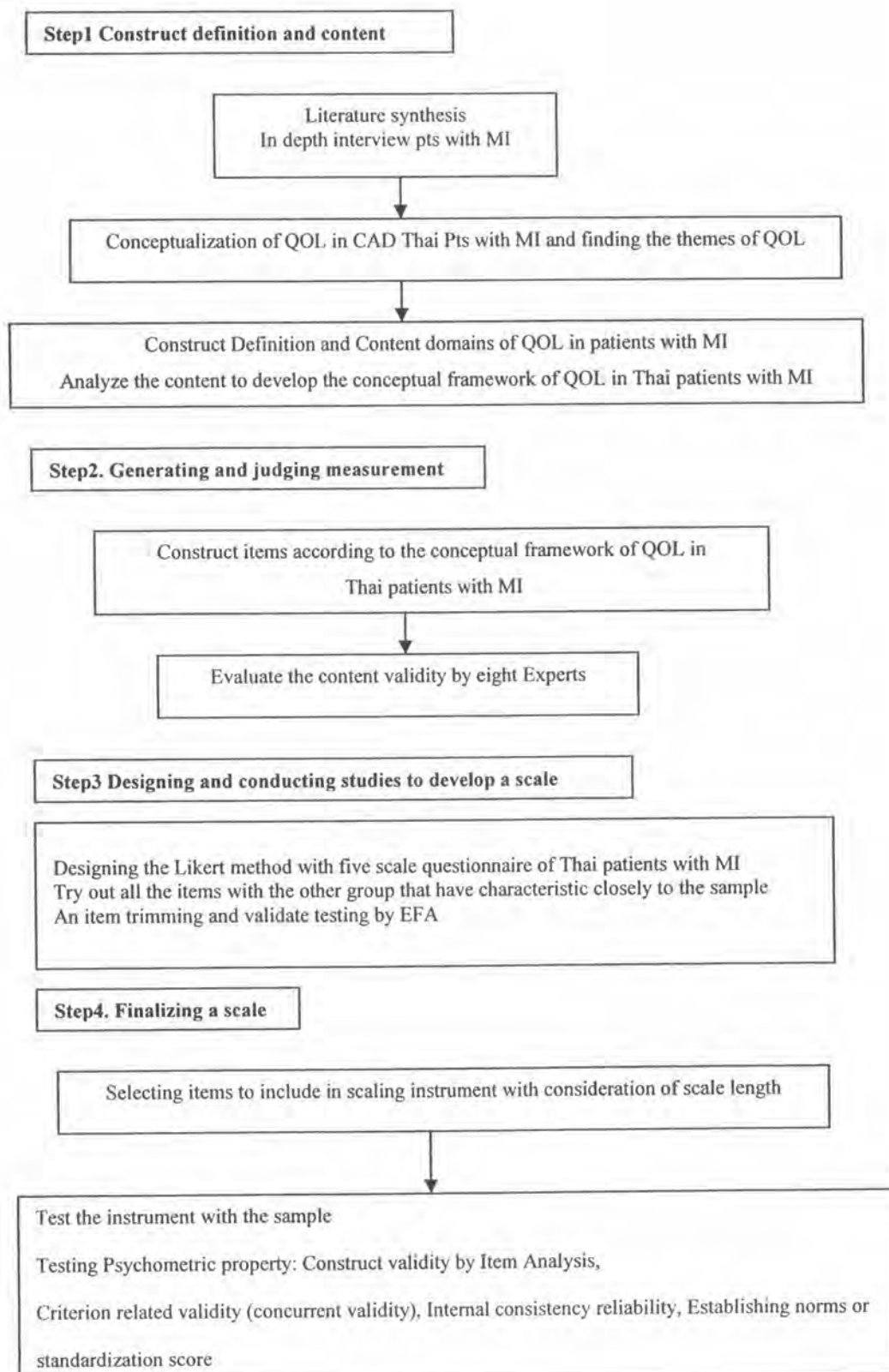
Step4. Finalizing the scale

Several studies should be used to help finalize the scale. Many of the procedures used and issues involved in refining the scale will also be applicable to deriving the final form of the scale. These include 1.) the importance of several samples from relevant populations, 2.) designing the studies to test the various types of validity, 3.) item analyses via EFA with a focus on the consistency of EFA results across samples from step 3 to step 4 in testing an initial factor structure, 4.) item analyses and confirmatory factor analyses (CFA), 6.) additional item analyses via internal consistency estimates, 7.) additional estimates of validity, 8.) establishing norms across studies, and 9.) given the numerous studies have been done across various settings, applying generalizability theory of the final form of the scale.

Rules of measurement require a bit more explanation. Some rules are obvious and universal but social psychological constructs are not so obvious. Although there are no universal rules for measuring such constructs, developing rules that are eventually accepted is important for standardization and establishing norms. A measure is standardized when (1) rules of measurement are clear, (2) it is practical to apply, (3) it is not demanding of the administrator or respondent, and (4) results do

not depend on the administrator (Nunnally & Bernstein, 1994). To avoid confusion among related attributes, the exact nature of the attribute must be carefully determined and specified. As noted by Nunnally & Bernstein (1994), some attributes are so abstract that they may be amenable to measurement.

Figure 2. The steps of the development of QOL instrument in Thai patients with post myocardial infarction



The fifth section

The psychometric Testing

In classical measurement theory, an observed score on any measure is seen as a combination of a true score (what a subject would get if the instrument were perfect) and random and systemic error.

Random error results from chance variations in the test (the directions may not be clear), the subject (he or she may have a headache today), or the conditions of test administration (the room may be hot or not all administration may use the same instructions). Random error reduces the consistency of measurements and indirectly makes it difficult to know what exactly is being measured. The larger the portion of random error in a score, the lower the reliability coefficient of the tool will occur. The lower the reliability coefficient, the lower the confidence can be placed in any subsequent judgments or the relationship using the tool (citation).

Systematic error results from the presence of some extraneous factor that affects all measurements made with the tool in the same way. Systematic bias compromises validity, the extent to which an instrument measures what it is intended to measure. Psychometric properties or psychometric characteristics of instruments are used to evaluate measures. The criteria that are most relevant depend on the goals of the assessment and the scientific endeavor undertaken. Although differing opinions exist, one view that seems to be shared by most social scientists is that results based on a measure should be repeatable and that the measure itself is standardized. Repeatability and standardization are related concepts. Under similar circumstances, a research finding based on the same measure should replicate. This is the basic tenet of repeatability: that the measure performs reliably under similar testing conditions. The

psychometric properties of the measure (reliability and validity) should be examined (Bowling, 1997; Jenkinson, & McGee, 1998).

1. Reliability

Reliability of a quantitative instrument is a major criterion for assessing its quality and adequacy. An instrument's reliability is the consistency with which it measures the target attribute. Reliability also concerns a measure's accuracy or true scores. The reliability of an instrument can be assessed in various ways. The method chosen depends on the nature of the instrument and on the aspect of reliability of greatest concern. Three key aspects are stability, internal consistency, and equivalence (Polit & Beck, 2004).

1.1 Stability

The stability of an instrument is the extent to which similar results are obtained on two separate administrations. The reliability estimate focuses on the instrument's susceptibility to extraneous factors over time.

Assessments of an instrument's stability involve procedures that evaluate test-retest reliability. The researcher administers the same measure to a sample on two occasions and then compares the scores. The comparison is performed objectively by computing a reliability coefficient, which is a numeric index of the magnitude of the test's reliability. The value of the reliability coefficient theoretically can range between -1.00 and +1.00. Reliability coefficients above .70 usually are considered satisfactory (Polit & Beck, 2004). On the other hand, reliability is normally determined using Cohen's Kappa or Pearson's or Spearman's correlation coefficient. Normally, levels in excess of 0.60 indicate an adequate test-retest reliability (McDowell & Newell, 1996; Jenkinson & McGee H, 1998

1.2 Internal consistency or homogeneity

Instruments designed to measure and attribute ideally are composed of items that measure that attribute and nothing else. An instrument may be said to be internally consistent or homogeneous to the extent that its items measure the same trait. The internal consistency reliability is concerned with the homogeneity of items comprising a scale assessed in an item's interrelatedness. Items comprising a scale should show a high level of internal consistency. Some commonly used criteria for assessing internal consistency are individual corrected item-to-total correlations, the average inter-item correlation among scale items, and a number of reliability coefficients (Churchill, 1979; Cortina, 1993; DeVellis, 1991; Nunnally & Bernstein, 1994; and Robinson, et al., 1991).

The most widely used internal consistency reliability is Cronbach's alpha coefficient. The closer the coefficient is to 1, the greater the homogeneity between the items and, therefore, the greater the confidence that can be attributed that items relate to the domain under investigation. However, caution should be noted as alpha coefficients of > 0.95 can mean that several of the items are in fact measuring the same thing (McDowell & Newell, 1996; Jenkinson & McGee H, 1998).

Kuder-Richardson methods (KR20 and KR21) are special cases of alpha used when data are dichotomously scored, that is when each item in a test is scored 1 if correct and 0 if incorrect or missing.

The old method for assessing internal consistency is the split half technique. For this approach, items on a scale are split into two groups and scored independently. Scores on the two half tests are then used to compute a correlation coefficient known as the Spearman-Brown. The split half technique is easy to use, but is handicapped by the fact that there are different splits (Polit & Beck, 2004).

1.3 Equivalence

A measure's reliability by way of the equivalence approach is a primarily observational measure. It needs the accuracy of observer rating, careful training, the specification of clearly defined, non-overlapping categories and the use of a small number of categories. Instruments include both the category and rating system and the observers making the measurements. Interrater (or interobserver) reliability is estimated by having two or more trained observers watching an event simultaneously and independently recording data according to the instrument's instructions. The data is computed by an index of equivalence or agreement between observers. Correlation coefficient technique is suitable to use.

2. Validity

Validity denotes the scientific utility of a measuring instrument, how well it measures and what it purports to measure. Validity has been given three major meanings: (1) construct validity---measuring psychological attributes, (2) Criterion-related validity --- establishing a statistical relationship with a particular criterion, and (3) content validity--- sampling from a pool of required content.

2.1 Construct validity is an assessment of the degree to which a measure actually measures the latent construct it is intended to measure. Cronbach and Meehl (1955) state that demonstrating construct validity involves at least three steps: (1) specify a set of the theoretical constructs and their relations (a theory), (2) developing methods to measure the constructs of the theory, and (3) empirically testing how well manifest (observable) indicators (items) measure the constructs in the theory and testing the hypothesized relation among the constructs of the theory as well.

Clearly defining the construct---its facets and domains--- is an essential first step that many consider the most difficult step in the scaling process (Churchill, 1979; Haynes, et al, 1999; Nunnally & Bernstein, 1994). For measuring the relevant latent constructs in the social sciences, the constructs should be grounded in a theoretical framework. In essence, there can be no construct validity of a measure without a well-specified theory. The well thought-through theory starts with construct conceptualization/definition based in a thorough review of the literature.

2.2 Criterion related validity implies an item or scale is required only to have an empirical association with some criterion or gold standard. It involves determining the relationship between an instrument and an external criterion (Polit & Beck, 2004). The instrument is said to be valid if its scores correlate highly with scores on the criterion. A correlation coefficient is computed between scores on the instrument and the criterion. The magnitude of the coefficient is a direct estimate of how valid the instrument is, according to this validation method. Criterion-related validity can be divided into concurrent validity and predictive validity.

2.2.1 Concurrent validity refers to the ability of an instrument to distinguish individuals who differ in their present status on some criteria (Polit & Hungler, Criterion-related validity is often referred as predictive validity which means the ability of an effectively

2.2.2 Predictive validity refers to the ability of a measure to effectively predict some subsequent and temporally ordered criterion.

2.3 Content validity represents the degree to which elements of a measurement instrument are relevant to and representative of the targeted construct for a particular assessment purpose (Haynes et al., 1995). This type of validity can be evaluated in psychosocial and physiologic measures in a similar manner. The measure

should appear consistent with the theoretical domain of the construct in all aspects, including item wording, response formats, and instruction (Netemeyer, et al., 2003). Experts in the field are contacted and asked to evaluate whether the method being used in the analysis is appropriate.

Both reliability and validity are not one-time-only attributes: they need to be re-established when the instrument is used in a different population or culture. Validity depends on reliability in that a tool must measure something consistently before one can determine what that something is. An instrument can be reliable without being valid, but an unreliable instrument cannot possibly be valid.

Norms

Norms are any statistical data that provide a frame of reference to interpret an individual's scores relative to scores of others since an absolute correct number has little meaning in isolation (Nunnally & Bernstein, 1994). Norms are essential when a measure is intended for use in individual decisions. Norms usually are expressed both as percentiles and standard (*Z*) scores to expedite communication. A "percentile" indicates the percentage of persons in the normative sample at or below a particular score.

Establishing Norms

The process used to establish norms involves several steps carried out after the final version of the instrument has been produced (Nunnally & Bernstein, 1994; Burn & Grove, 1997):

1. A sample group (or groups) of individuals who are representative of those for whom the measure is designed is selected.

2. The final form of the measure is administered to those individuals according to the set procedure or protocol that has been developed under conditions that are identical to those recommended for administration.

3. Raw scores of the sample individuals are plotted in a frequency distribution and descriptive statistics are computed.

4. A decision is made regarding the statistical units that will be used to express the norms and those statistics are computed.

5. Tables and graphs displaying the norms are prepared.

6. Norms are updated as necessary by reapplying step 1 to 5.

Summary

The quality of life in Thai patients with post myocardial infarction is affected by disease. There is no QOL instrument developed on the basis of Thai culture and Thai people. The literature review provided the important scientific based knowledge, the significance, and the procedures for developing the QOL instrument. The QOL instrument development for Thai patients with post MI is demanded. Steps of instrument development were reviewed including psychometric property testing which was reliability, validity. Norms were included in this study