FACTORS INFLUENCING PERCEIVED HEALTH STATUS OF PATIENTS WITH CORONARY ARTERY DISEASE

by

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CHAPTER I

INTRODUCTION

Health professionals rely heavily upon clinically measured health status in making disability assessments. However, the rehabilitation literature does not entirely warrrant this high degree of reliance on physical assessment measures to predict behavioral responses to illness (Wright, 1960). In fact, some workers insist that there is no direct relationship between the type or severity of impairment and the resultant disability (Shontz, 1975). The meaning patients attach to their illness has been identified as a crucial intervening variable in understanding their response to illness. Currently, this personal interpretation of illness, labeled self-assessed health, has begun to generate interest among behavioral scientists. Self-assessed health may help explain the phenomenon of persons with a medically diagnosed condition showing significantly different degrees of a resultant handicap. Nurses and other health workers are frequently in a position to influence patients' belief systems in regard to their health. Such influences could have important consequences for the patients' course of recovery. Therefore, understanding the ramifications of health perceptions may be beneficial to health professionals and their patients.

Additionally, the usefulness of general self-ratings in predicting health related behavior and use of health services is quite clear as argued by Ware & Karmos (1976), because the decision to seek health care is based largely on the self assessed need for it. Self ratings of health are frequently used in surveys and studies of various aspects of health care: (1) to study relationships among health constructs, (2) to explain health and illness behavior, (3) to describe the health of populations where physical examination is not feasible, and (4) in the planning and allocation of services and resources.

One group of chronically ill that may benefit from further knowledge of the role of health perception in recovery is cardiovascular heart disease patients. Heart disease is the most prominent cause of death and disability in this country. According to the American Heart Association (1980) over 4 million people have a history of coronary heart disease and nearly 1 million die from this disease and its complications each year. The estimated cost of heart disease in deaths and disability was more than 30 billion dollars in 1974, according to the National Heart and Lung Institute (NHLI). The optimal functioning of people disabled with heart disease has been the subject of much research and study. There are several excellent reviews of the literature in this area (Croog, Levine, & Lurie, 1968; Doerhman, 1977; Safilios-Rothschild, 1970).

There have been many measures of adjustment to heart disease including return to work, social activity, and morale. The great variety and idiosyncratic methods of measuring outcome have led in part to difficulties in drawing conclusions about the predictors of recovery. The NHLI (1975) Task Force on cardiac rehabilitation has identified perception of health as an underlying theme related to the many disparate measures of outcome. An extensive review of literature led this group to conclude that the social and psychological adjustment of patients is largely influenced by the patient's perceived health status. They suggested that health perception is the agency through which many predictor variables have an impact on outcome. Health perception then in this context is seen as an intervening variable.

Further study of health perception and, hopefully, discovery of ways to modify it may be beneficial to recovering heart patients and others with chronic illness. The theoretical framework linking this variable to recovery is still in its beginning stage. If health care professionals understood more about health perception, its formation and content, then perhaps they could be more instrumental in assisting the chronically ill to develop beliefs, attitudes and goals that would lead to more favorable outcomes. This investigation will deal with a population sample of patients recovering from coronary artery disease (CAD),

focusing on the variable of perceived health. More specifically this study addresses the various demographic, physiological and psychological variables that may influence and predict perception of health.

Review of Literature

In the following review, the concept of health perception is described and its relationship to other health related and psychological measures is explored. The nature of coronary artery disease is briefly discussed and selected psychological characteristics of individuals with this disease are described as they relate to health perception.

Perceptions of Health and Health Related Issues

Perception of health can be understood in part as an assessment of oneself. The study of perceptions is a branch of psychology and theories of self-perceptions have become another area of specialization. As introduction to the very specific area of self-perceptions of health, a brief and general description of self perception follows. In a broad sense, perception is viewed as a two stage process: the physical stimulation of senses and the organization of this input into meaningful interpretation (Lindzey, Hall & Thompson, 1965). Perceptual abilities are influenced by the maturation of the nervous system, by the individual's personality, and by sociocultural factors associated with

language development and socialization (Lewis, 1963). Perception is a subjective experience.

Perceptions of self refer to the meaningful assimilation of stimuli that come from the environment within the body. The awareness of those stimuli may be conscious and specific of a relatively vague and nonconscious reaction to bodily changes (Mason, 1961). Behaviorists and social psychologists have developed self-perception theories that describe processes of learning self-description and of comparison to others as a means of self-perception (Bem, 1972; Festinger, 1954, 1957; Rotter, 1954). Exploration of these theories is beyond the scope of this investigation. However, they do provide important background information for understanding perceptions of health.

The theoretical deliniation of health perception remains an enigma. It has been employed as an independent variable predicting various measures of recovery. For example, in two investigations of adjustment following heart attack, Garrity (1973a & b) found that health perception was the strongest predictor of morale and of return to work. Brown and Rawlinson (1975), studying the tendency to relinquish the sick role following heart surgery, found that health perception was significantly and independently related to movement out of the sick role. In another study of morale following heart surgery, these same investigators (1976) found health perception among several characteristics predictive of morale. Others have

shown a relationship between life satisfaction and health perception among the elderly (Edwards & Klemmack, 1973; Maddox & Eisdorfer, 1962; Palmore & Luikart, 1972; Wan, 1976). However, the exact role of health perception in predicting recovery is unclear, as is its relationship to other predictor variables.

Several investigators have begun to advance theories exploring the influence of health perception in recovery and other health related behaviors (Garrity, Somes & Marx, 1978; Ware, 1976; Ware, Davies-Avery & Donald, 1978). As was mentioned earlier health perception is seen by several as an intervening variable. The NHLI Task Force (1975) described health perception as the agency through which many predictor variables affect outcome. Tornstram (1975) suggested that the effects of objective health status are channeled through subjective or perceived health status. Maddox (1964) proposed health perception as an intervening variable between objective health and the occupation or rejection of the sick role.

Definition and Measurement of Health Perception

Although placement of health perception in clear relationship to recovery variables is uncertain at this time, more advances have been made in establishing operational definitions and providing tools for the measurement of health perceptions. A variety of labels are used in the literature

for the concept of self ratings of health: perceived health status, self-assessed health, self-health ratings, subjective health, and self perception of health status. The labels generally capture the notion of subjectivity and self assessment. Tissue (1972) described self ratings as a representative statement of the way numerous aspects of subjective and objective health are combined in the perceptual framework of the individual. According to Ware, Davies-Avery, and Donald (1978), the following distinctions can be made about self ratings of health: they ask explicitly about personal "health" as opposed to descriptions of behavior or functional ability; they reflect an integrated view of a construct underlying specific components of health, and, they are subjective, but designed to assess objective as well as subjective aspects of health as perceived by the individual.

Most measurements of health perception have used a single item questionnaire with two to ten response categories i.e. Would you say that your health is good, average or poor? There have also been some scales constructed from health rating items. Description and analysis of these can be found in Ware et al. (1978). From their review they found no reported reliability estimates from investigators using single item measures, although there were data on the stability of health ratings over time (Heyman & Jeffers, 1963; Maddox, 1964; Suchman, Phillips, & Streib, 1958). The

validity of general health ratings has not been addressed in published articles, but has been presumed from the content of questionnaire items, called face validity. Ware et al concluded that although the information is sparse with regards to reliability, there is the suggestion that ratings are reliable, reproducible and stable beyond the expectations of chance alone. They also have assessed validity based on associations between health ratings and health related variables in the literature. They hypothesized the following relationships if health ratings are valid: 1) strong association among ratings measured differently, 2) strong associations between ratings and specific health components, 3) positive associations between personal ratings and those of physicians, 4) negative associations between ratings and illness behavior, and 5) less favorable ratings with increasing age. For the most part these relationships were verified in the literature.

Health Perception and Objective Health Status

The expected relationship between self ratings of health and objective evaluation by a physician has been explored by many (Freidsam & Martin, 1963; Maddox, 1962, 1964; Suchman, Phillips & Streib, 1958). The relationship is strong and positive but not as clear as one might expect. For example, Suchman et al, studying 2500 subjects over 65, hypothesized that self-ratings of health and physician

ratings would be significantly related. They also hypothesized that self-ratings would be more closely related than physician ratings to attitudinal factors such as worry about health, general happiness, considering self as old and dejected. They found self and physician ratings significantly related at the .01 level. However, they also found self-ratings more related than physician ratings to the above attitudinal as well as behavioral aspects of health, i.e. confinement to bed and limitation of activity. They concluded that self-ratings were more valid predictors of subjective correlates of health than were actual medical conditions.

Continuing in this vein, Freidsam and Martin (1963), testing nearly identical hypotheses as Suchman et al, also found that self and physicians ratings were significantly correlated and that behaviors and attitudes associated with health were more highly correlated with self ratings than with physicians' ratings of health. The authors suggest that self ratings may also be a measure of self image, especially in an older population. Thus it can be seen that self ratings of health include more than objective physician ratings of health status.

In a 1962 investigation, Maddox explored medical, social and psychological factors associated with self assessed health in an elderly population, median age 70 years. Self assessed health, the dependent variable, was determined

by a 4 point scale, later dichotomized to "subjectively good" or "subjectively poor". Objective health status was determined by a comprehensive medical examination and a 5 point scale of physiologic function. From the data, Maddox concluded that objective health status was the most important single determinant of self assessed health. Other independent variables related to health perception will be discussed in later sections.

Presenting somewhat contrary results in seeking the identity of factors most closely associated with general self-assessments of health, Tissue (1972) found subjective responses to health more closely associated with self assessments than were the objective measures. Studying a population of 256 aged welfare recipients, he interviewed for the following categories of variables underlying general self-ratings: objective conditions of physical health, subjective feelings of optimism or apprehension concerning one's physical state, recent hospitalization and medical care, and considerations of morale, self-image and response to aging. Self-rating in this case was determined by response to the question, "Generally speaking, how would you describe your present health? Is it good, fair, or poor?" Description of the sample's perceptions of their health is as follows: 33% indicating good health, 46% fair health and 21% poor health. The belief that one is in good health was found to be most closely related to the following subjective

responses: perception that health has remained stable, that it is superior to that of one's age peers, and that health does not represent a source of worry. The objective measures were two: a count of the number of health problems and a 6 point scale of functional capacity.

Summarizing the studies cited thus far, it can be said that the findings are mixed. There appears to be a correlation between objectively measured health and self assessments of health as might logically be expected. However, as Tissue's findings indicate, subjective criteria are more closely correlated with perceived health than are objective measures of health. Health perception itself has been shown to be more closely related to attitudinal and psychological factors than is objective evaluation of health. While findings are obviously not definitive as to the determinants of self-assessed health, they do point to the importance of factors other than clinically measured health status.

Health Perception and Social-Psychological Factors

What are some of the factors aside from objective health status that contribute to perceived health? The attitudinal and psychological factors previously described as correlated with health perception include the following: general happiness, perception of health as stable and as superior to the health of one's age peers, apprehension and worry about health.

Maddox (1964) explored further the various aspects of health perception in a longitudinal study. He was interested in factors associated with differences in subjective responses to illness hoping to find implications for the management of incongruity between medical and subjective assessments of health status (hypochondriasis and denial of illness). Health perception and objective health status were measured as in his previously described investigation (1962). In addition to objective health status, independent variables included social placement and attitudinal factors, i.e. age, sex, major lifetime occupation, type of and level of activity maintained, morale, and preoccupation with health. A pattern of social and attitudinal factors appeared to explain the self-assessments that differed from objective health status. These self assessments were called incongruent. Incongruent self-assessments were those in which objective health status was rated as good and self-assessment rated health as poor, called "pessimism" by Maddox; or objective health status was rated as poor and self-assessment rated health as good, called "optimism".

Seeking an understanding of incongruent assessment, i.e. hypochondriasis and denial of illness, Maddox (1964) hypothesized that optimism about health would be associated with a pattern of social and attitudinal factors, and that pessimism about health would be associated with an absence of those factors. Indeed the predisposition toward

optimism was positively associated with being male, older, of higher status (experience in non-manual occupation, but unemployed), being less preoccupied with health, having high morale (feeling satisfied with self in relation to others and the environment), and being fairly active in ways not involving contact with other persons. This non-interpersonal activity was considered important by Maddox because it is relatively free from evaluation by others. Pessimism about health was associated with the absence of the above factors.

Compared to those who were pessimistic, persistently optimistic subjects exhibited more pathology over the period of study when compared on the presence or absence of seven chronic processes like heart function, pulmonary disease, psychiatric abnormalities, and arthritis. This finding may suggest that optimistic subjects employ repression or denial in response to their physical condition.

Although Maddox does not fully explore the psychological correlates of self-assessed health, he dealt with these aspects to a limited degree. He observed that subjects who tend to exaggerate their poor health are preoccupied with their health and also are poorly adjusted as indicated by feelings of depression, neglect and low morale. He further suggested that these subjects would be likely to find the sick role an attractive alternative. Although the inference is there, he was unwilling to predict inappropriate

occupation of the sick role based on this study alone. However, based on the pattern of characteristics found in his research, he hypothesized that the pessimistic subject would tend to display the characteristic behavior of the hypochondriac. A corollary follows that those who tend to exaggerate their good health (optimists) would also be less preoccupied with their health than others, would show better adjustment to their symptoms of illness, and may be more likely to employ the mechanism of denial.

Exploration of sociodemographic factors associated with perceived health can be found in the study by Wan (1976). Using ingenious analytic techniques, he identified five clusters of individuals based on similarity of health perception and on sociodemographic variables like retirement status and education. The sample included 11,153 noninstitutionalized adults aged 58 to 63. Wan sought to find predictors of personal perception of health in indicators of physical, social, and psychological well-being. Self-assessed health was determined by comparison to others of same age and dichotomized to better or worse than others. While predictors varied somewhat among the clusters, the sociomedical factors overall proved the most predictive of health perception. Of these factors, severity and duration of disability accounted for most of the total variance in health perception. In addition, perceived personal happiness and employment status were also predictive

of health perception for the total sample, as was general life satisfaction for two of the sub-groups.

Further pursuit of the social variables led Wan to the finding that those subjects unable to work or retired had a poorer view of their health than those working or looking for work. This is contrary to Maddox's finding that older men who had experienced a change in work role, like retirement, had a better health perception than those who continued in their lifelong work role. It should be remembered that Maddox's sample was considerably older, median age 70. There is evidence that self-assessments of health tend to improve after retirement (Thompson & Streib, 1958). Wan goes on to identify those subjects with little or no education and those in farm laboring occupations as having a worse view of their health than the college educated or professional and managerial occupations, including private household workers.

Ware, Davies-Avery, and Donald (1978), summarized the research concerning demographic and socioeconomic correlates of health ratings. For example, those reporting higher educational standing tend to rate their health more favorably; income and general health ratings appear positively correlated; a greater percentage of manual workers manifest negative health ratings as compared to non-manual workers; changes in health perceptions of retirees were more likely to improve, and changes in health ratings of the employed

were more likely to decline. With regards to socioeconomic status, people with higher status were more likely to report good health than those with lower status. Men seem more likely to rate their health favorably than women.

In a recent study seeking the determinants of personal perception of health, Mechanic (1974) found in a sample of 151 London women that health perception was related to psychophysiologic symptoms like tiredness, poor appetite and difficulty sleeping. Those subjects reporting poorer health status also had a history of chronic illness, emotional problems, and high levels of stress and life change. These results were somewhat duplicated on a large sample of college students, by Greenley and Mechanic (1973), as reported in Garrity, Somes, and Marx (1978). Here poor perception of health was associated with psychophysiologic distress, as measured by Langner's (1962) index, and with symptoms of depression, including difficulties in activities of daily living.

Garrity et al. (1978) explored numerous variables for their relationship to health perception. Their review identified the following variables as influential of self-ratings of health: clinically measured health, long-standing personal assessment of health status, recent life change and stress experience, psychophysiologic distress, history of chronic and disabling physical and emotional problems, age, sex, socioeconomic and employment status.

With a population of 314 college students, Garrity et al. found psychophysiologic symptoms as measured by Langner's index to be the strongest correlate to health perception. Langner's (1968) index is comprised of items that seem to tap areas of psychological disorder. Recent life change was also significantly correlated with health perception. Thus again there is demonstrated an interplay between psychological responses, objective physical events and perceptions of health.

The previously cited studies have examined health perception and its correlates in a variety of populations, including the elderly and college students. Examining health perception in a population with a known chronic severe illness would add a different dimension to the exploration of this potentially powerful variable.

In summary then health perception is not only associated with actual state of health, but also with a variety of social and psychological factors. Social factors shown to be associated with perceived health include age, sex, work status, socioeconomic status, and activity level. Psychological factors associated with perceptions of health include the following: apprehension and worry about health, preoccupation with health, general happiness and morale, perception of one's own health as superior to that of one's age peers, perception of one's health as stable, denial, and general psychological adjustment.

Nature of Coronary Artery Disease and its Physical and Psychological Concomitants

Because the current investigation deals with a chronically ill population of persons with heart disease, a brief description of the physical and psychological concomitants of this disease may be helpful in understanding the special characteristics of this sample and their possible influence on perception of health.

Coronary artery disease is a well publicized killer in this country. The disease strikes an organ of the body which is known to impose the threat of sudden death. Even if death is not imminent, certainly the victim's life is dramatically altered in adjusting to physical limitations and continual threat of sudden death.

CAD is caused by a narrowing of the coronary arteries due to arteriosclerotic changes. For the heart muscle to function properly, it must have an adequate blood supply. The coronary arteries supply the heart with freshly oxygenated blood. Blockage of blood to the myocardium may be partial and temporary resulting in angina pectoris, or the blockage may be complete and protracted resulting in myocardial infarction. As the myocardium becomes starved for oxygen, the patient experiences pain in the chest and arms.

The arteriosclerotic changes in the coronary arteries develop gradually and collateral circulation is usually established. However, collateral circulation can supply the myocardium with just enough blood to meet normal

requirements. Any extraordinary demand like exercise, emotional excitement, or even digesting a heavy meal may result in an inability to oxygenate the heart muscle. At these critical moments, the severe pain of angina strikes and generally forces the individual to stop his activity to rest (Luckmann & Sorenson, 1974).

The impact of having a diagnosis of heart trouble is one of considerable proportion. The effects of heart disease are not limited to physical symptoms. The effects extend to the cardiac patient's attitudes, personality and psychological responses. These features of a patient's life influence the patient's recovery and response to illness. This influence may occur through the agency of health perception as was previously described in considering health perception as an intervening variable. Also many of these psychological and attitudinal factors have been discussed in relation to health perceptions of a variety of sample populations. The attitudinal and psychological characteristics of cardiac patients will be briefly discussed in the following section.

The perceived health of cardiac patients may be influenced by the attitudes held about heart disease. No studies could be found in the literature which directly related attitude about heart disease and health perception. Rumbaugh (1966) developed an instrument which has been used to measure attitude toward cardiac illness. This instrument would be useful in investigating the anticipated relationship of attitude toward cardiac illness and health perception.

The overall psychological adjustment of heart patients in the recovery phase was the focus of Rumbaugh's work (1966) in the development of the Cardiac Adjustment Scale (CAS). This instrument was developed specifically to assess the psychological status of patients as it relates to their rehabilitation potential. The CAS correlates with personality factors of the Guilford-Zimmerman Temperment Survey. The CAS measures in part those factors identified in the GZTS as emotional stability, objectivity, and cooperativeness. Items of the CAS imply it is desirable for a heart patient "to want to live within prescribed limits, to view life as worth living, to want to help others, to have broad interests, and to view optimistically his ability to return to work" (Rumbaugh, 1966, p. 57). Conversely the CAS indicates it is undesirable for a heart patient "to view his life as a bitter struggle, to lack confidence in medical care, to feel that other people no longer respond to him with the respect and courtesy given normal individuals, and to be aware at all times of physical discomforts" (p. 57).

Many personality patterns have been identified as typical of cardiac patients. These patterns influence the person's response to the illness, and thus may also be associated with perceptions of health. Submission to a higher power has been described as typical of the long term reaction of heart patients to their disease (Croog, Levine & Lurie, 1968). Relinquishing control to powerful others and the striving for personal control are general personality characteristics

described by Rotter (1966) as locus of control, external and internal respectively. The construct was developed from social learning theory. Rotter defined as internal those individuals who believe that reinforcement is contingent on their own behavior. Externals are defined as individuals who believe reinforcement is controlled by outside forces such as fate or luck or powerful others.

The personality pattern called Type A, or coronary prone behavior, has been discussed in relation to locus of control (Glass, 1977). Type A individuals are described as engaged in a struggle for control. The style of Type A behavior, usually discussed in relation to prediction of CAD, consists of competitive achievement striving, a sense of time urgency, and hostility (Friedsam & Rosenman, 1974; Jenkins, 1976). Both Type A and internally oriented individuals appear to be engaged in a struggle for control. If Glass' reasoning is correct, then the cardiac patient will experience additional stress when confronted with the uncontrollable situation of his/her illness. Thus this personality characteristic, locus of control, may exert an influence on the patient's response to heart disease.

Although locus of control has not been studied directly in relation to health perception, it has been shown to be related to several measures of recovery and to health oriented behaviors (Cromwell, Butterfield, Brayfield & Curry, 1977; Strickland, 1978; Wallston & Wallston, 1978; Wallston, Wallston, Kaplan & Maides, 1976). Locus of control was included

in the present study on the premise that its effect on outcome may occur through the variable of health perception.

Further personality and psychological factors that have been shown to be important in the person's response to heart disease include depression, anxiety, and denial (Croog, Levine & Lurie, 1968). As these factors may exert an influence on outcomes, the influence may occur through the variable of perception of health. Thus brief discussion of emotional and psychological response to heart disease follows.

Studies describing the psychological and emotional responses to cardiac illness generally highlight one or two factors among several that may be indicated as prominent in any particular sample population. This clustering of psychological factors indicates that their effects occur from various combinations rather than the isolated impact of a few factors. The following discussion will reflect this highlighting and clustering.

Doehrman (1977), reviewing literature since 1968, noted studies using the Minnesota Multiphasic Personality Inventory (MMPI) to describe the emotional distress of post-hospital CAD patients. Several factors were identified as prominent. The MMPI results for patient samples were elevated as compared to controls on the neurotic triad: hypochondriasis, depression and hysteria. CAD patients were also abnormally high on the MMPI anxiety scale.

Denial has been highlighted by many as a factor in the adjustment of CAD patients (Croog, Shapiro & Levine, 1971;

Gentry, Foster & Haney, 1972; Rosen & Bibring, 1966; Stern, Pascale & Ackerman, 1977). In general the patient who successfully denies emotional stress appears to be better adjusted. Also denial seems to dampen the experience of anxiety and those patients experiencing less anxiety appear to have lower mortality rates than those who worry over their health.

More specifically, the Repression-Sensitization Scale (R-S) of the MMPI has been used to measure denial. Repression and sensitization are considered as characteristic coping styles, or as a characteristic mode of responding to threatening stimuli. Denial has been associated with the predominently repressive end of the contimuum and anxiety has been associated with the predominantly sensitizing end of the continuum. Studies of heart patients in relation to the R-S factor have shown that patients who are "repressors" appear to have more positive outcomes than "sensitizers" (Cromwell et al., 1977; Rawlinson, 1970).

Studying the psychological factors in heart disease, Stern, Pascale and Ackerman (1977) compared the post-infarction adjustment of 68 heart patients. Using an interview questionnaire designed by Hackett & Cassem (1977) to assess denial, they found the deniers continued to function well during the year following hospitalization. Nearly 80% were at work within the year and were also sexually active. Of the depressives, 70% failed to remain at work and/or function sexually. Readmission rate for depressives was 70%, and for deniers approximately 20%. Another finding from this study showed

depression and anxiety occurring together. These investigators concluded that post-infarction patients who are depressed at the first post-hospital visit comprise a population at risk both psychologically and physiologically.

Rosen and Bibring (1966) also identified denial and depression as important features in the psychological reactions of heart patients. They showed an interesting interaction between depression and age. In a hospitalized sample of male patients aged 35 to 67 years, overt depression was highest among the 50 year olds. It was suggested that depression among the younger patients would not be reported even if present, as denial was prominent in this age group. In contrast the old group, 60 to 70 years of age, was described as fairly passive and compliant, having resolved many conflicts about dependent behavior.

The psychological factors considered in this review to be important in the patient's response to heart disease included depression, hypochondriasis, hysteria, denial, anxiety, locus of control, and attitude toward cardiac illness. Inclusion of these factors in the present study was based on the premise that their effect on outcome may occur through health perception.

Purpose of the Study

The review of the literature has shown health perception to be an important factor in health behaviors and in adjustment to disability. This variable is associated with objective health status and several psychosocial factors: history of

chronic and disabling physical and emotional problems, worry over health, age, socioeconomic and employment status, previous personal assessment of health, and comparison of own health to that of one's age peers.

It is the purpose of this investigation to further explore selected physical, social and psychological factors for their relationship with health perception. The focus here is not on the outcome of rehabilitative efforts, but rather this study seeks to find what factors are associated with a positive or negative perception of health in the person with CAD.

CHAPTER II

METHOD

Subjects and Setting

Subjects for this study were drawn from patients participating in an on-going study of the effects of by-pass surgery and medical management for chronic stable angina (Kloster, Kremkau, Rahimtools, Ritzman, Rosch & Kamarek, 1979). That prospective study was initiated in 1971 at the University of Oregon Health Sciences Center and the Veteran's Administration Hospital in Portland, Oregon. The criteria set for inclusion of subjects were the following: chronic disabling angina pectoris present for at least one year; 62 years of age or less; no episodes of unstable angina or myocardial infarction within six months; no evidence of congestive heart failure, cardiomegaly or major disabling illness; and, willingness to participate in a long term research study. Potential subjects were hospitalized for further testing to determine suitability for surgery. Tests included coronary and left ventricular angiography, myo-cardial metabolic studies, exercise stress electrocardiography, and echocardiography.

Evaluation of risk factors and test results were reviewed by staff cardiologists and cardiovascular surgeons. The

candidates who met the criteria and were willing to participate were then randomly assigned to the medical or surgical treatment group. Surgery was scheduled to take place promptly, and medical regimens were reviewed to ensure that optimal treatment be given. Subjects were examined every two months in a special outpatient clinic and at six months were rehospitalized for repeat physiologic function tests. Following this, clinical evaluations were done at two and four months intervals. The results of the physiological evaluations and comparisons can be found in Kloster et al., (1979).

Subjects were investigated not only for cardiac function in response to the two treatment methods, but also in another study (Brown & Rawlinson, 1979) for the quality of their lives during rehabilitation. For this aspect of investigation an additional criterion was set, which held for the present study as well. Social and psychological data were collected only for patients who had been in the randomized study for at least nine months. This time period was estimated as necessary to allow for adjustment to treatment and to complete post-operative recovery.

The desired sample size of 100 for the prospective study was reached in late 1976. Attrition lowered the number to 51 (25 medical and 26 surgical) by 1977. Patients were terminated from the study because of myocardial infarction, patient's request, unstable angina, unresponsive to conventional medical treatment, and death.

Data Collection Instruments

A structured interview was used to collect demographic and health related information (see appendix B). Several instruments were selected from the literature to measure subjective and psychological variables; the Minnesota Multiphasic Personality Inventory, the Cardiac Adjustment Scale, the Cantril ladder, and the Health Locus of Control Scale. Medical records of subjects provided data on physiological status. These were available through the Division of Cardiology and Cardiovascular Radiology and Cardiopulmonary Surgery of the University of Oregon Health Sciences Center and Veteran's Administration Hospital.

Measurement of Dependent Variable

The Cantril ladder (Cantril, 1965) was used to measure health perception (see appendix C). The advantages of this measurement technique are that it provides a theoretically continuous and equal-interval scale and it is "self-anchoring", that is, the subject's own perceptions of best and worst health are the referrants for the subject's response. The technique has been widely used to measure health perception (Brown & Rawlinson, 1979; Garrity, 1973a; 1973b; Garrity, Somes & Marx, 1978; Palmore & Luikart, 1972).

Each subject was presented with a picture of 9-rung ladder, labeled at the top "best possible health" and at the bottom "worst possible health". S/he was asked to

indicate on the ladder the steps best representing 1) his/her health "right now", 2) his/her perceived health one month before treatment, 3) the health of the "average person" his/her age, and 4) the health of a "sick person" his/her age. Scores can range from 0 to 9 for each item. The difference between judgments of health right now and before treatment provides a measure of the patient's perceived improvement, though pre-treatment health was viewed retrospectively. These scores also permit a comparison of the patient's judgment of the difference between his/her own health and that of others.

Measurement of Independent or Predictor Variables

Three categories of predictor variables were examined: psychological, demographic, and physical.

Psychological Factors. From the Minnesota Multiphasic Personality Inventory (MMPI) several scales were selected for their relevance to cardiac patients (Croog et al, 1968; Doehrman, 1977; Rosen & Bibring, 1966; Stern, Pascale & Ackerman, 1977), namely, the Hypochondriasis (Hs), Depression (D), and Hysteria (Hy) scales, known as the neurotic triad, Welsh's Anxiety Scale (Welsh & Dahlstrom, 1956), and Byrne's Revised Repression Sensitization (R-S) Scale (Byrne, Barry & Nelson, 1963). The raw scores from these scales were converted to T scores as is customary (Graham, 1977), in order to permit comparisons to normative

groups. Conversion to T scores adjusts the raw scores so that each scale has a mean of 50 and a standard deviation of 10. For each scale, except the revised R-S scale, T scores of 60-70 are considered mild elevations, 70-80 moderate, and above 80 severe elevations, indicative of psychological disturbance. Scores below 45 are considered as low, according to Graham (1977) which usually refers to minimal presence of the factor measured by a particular scale.

In the neurotic triad the Hs scale deals with general physical competence and somatic concerns. There are 33 items on the scale answered in true-false style, as are all MMPI scales. High scores indicate a tendency to acknowledge many rather vague somatic complaints and to report explicit symptoms, thus tending to deny good health. Elevations of the 60 item D scale suggest the presence of depression. Characteristics of depression noted by Graham (1977) include poor morale, general dissatisfaction with one's life situation, denial of happiness and personal worth, tendency to worry and pessimism. The 60 items of the Hy scale have been factor-analyzed suggesting two components: somatic complaints and an expression of an exaggerated need to appear in a favorable light. High scores indicate a claim that life is very good, that others are trustworthy and likeable and that the subject does not get depressed or tired. This indicates use of denial and rationalization. Cottle (1950) reported a test-retest reliability of .66 for depression, .81 for hypochondriasis and .72 for hysteria.

Welsh's Anxiety Scale gives an indication of the degree of anxiety. The 39 items cover 4 dimensions according to Graham (1977), namely cognitive processes; negative emotional tone and dysphoria; lack of energy and pessimism; and malignant mentation. High scores on this scale are associated with psychopathology. Welsh & Dahostrom (1956) report split-half reliability scores of .88 in a study with 108 undergraduates. In two other evaluations of this scale the following results were reported in Graham: A reliability coefficient of .70 in a test-retest separated by four months, and Kuder-Richardson (internal consistency) values of .94.

Byrne's Revised Repression Sensitization Scale (Byrne et al., 1963) gives a measure of an individual's characteristic mode of response to threatening stimuli. The measure includes 127 items. Low scores indicate repression, and high scores sensitization. The repressive extreme suggests avoidance defenses, such as denial and the sensitizing extreme indicates approach defenses, such as intellectualization. Reliability coefficients of the revised instrument are similar to those of the original instrument, namely, .94 on split-half test and .82 on test-retest. Byrne et al. claim the revised scoring key of 127 cross-validated items is a methodological improvement.

Locus of control was evaluated for each subject using the Health Locus of Control (see appendix D), which was

developed by Wallston, Wallston, Kaplan, and Maides (1976). The Health Locus of Control Scale (HLC) focuses on the specific area of health expectancies, as opposed to Rotter's measure of generalized expectancy. For the HLC, an 11-item scale is set in a 6-point Likert-type format with potential scores of 11 to 66. For a sample of 98 undergraduates tested during the development and validation of the HLC, the mean score was 35.57, and the standard deviation, 6.22. Low scores indicate internality, i.e. belief that one's health is affected by one's own actions and high scores indicate externality, i.e. belief that one's health is beyond one's control. In two tests of differential functional utility of the HLC and Rotter's scale, the correlation between the two measures of .25 (N=85) and .46 (N=34) (Wallston et al., 1976). This low correlation indicates that different features of locus of control are measured by the two scales. The test-retest reliability of HLC over an eight week interval was .71.

In order to measure psychological adjustment to heart disease Rumbaugh's (1966) Cardiac Adjustment Scale was used (see appendix E). It was developed specifically for the psychological assessment of heart patients as that relates to their rehabilitation potential. The scale is thought to measure in part emotional stability, cooperativeness, and objectivity. It has been used to predict return to work of cardiac patients (Rumbaugh & Kuzman, 1962). The 160-item

questionnaire asks for opinions and beliefs about people who have heart trouble. Responses can be "yes", "no", or "?", and scores can range from 0 to 156. Based on responses of 178 patients tested in two Work Classification Units sponsored by the American Heart Association, the mean score was 126.4 with a standard deviation of 14.9 (Rumbaugh, 1964). Low scores indicate poor adjustment and high scores indicate good adjustment. The reliability coefficient of the scale has measured at .94 by the Spearman-Brown formula and was obtained by administering parallel forms to 79 patients. Validity was established by checking status of 85 patients after a three year interval.

Demographic Factors. The demographic variables used in describing this sample included age, sex, marital status, and socioeconomic status. Socioeconomic status was measured by Green's Index (Green, 1970), which combines income, education, and occupation. The score was calculated from items 4, 5, 6, and 7 of the interview. The individual items were used for descriptive purposes, and the composite score for statistical analysis.

Physical Factors. Although the physiological effects of treatment are not the focus of this paper, selected "objective" measures of physical and cardiac status may be fruitfully compared to subjectively perceived health status. Many measures of cardiac condition of these patients have

been recorded and analyzed elsewhere (Kloster et al., 1979). In consultation with these researchers the following measures of left ventricular function were selected: ejection fraction and left ventricular end-diastolic pressure. Each of these measures was taken at the six month follow-up.

Left ventricular end diastolic pressure (LVEDP) was calculated by passing a catheter into left ventricle and recording pressure readings. End diastolic pressure, expressed in mmHg, is considered normal at less than 15 mmHg, moderately elevated at 15-20mmHg, and severely elevated at greater than 20mmHg. The mean normal pressure is 10mmHg and the mean pressure for persons with coronary artery disease is 15mmHg (Bristow, VanZee, & Judkins, 1970). Following catheterization, left ventricular coronary angiography was performed using the Judkins technique (Kloster et al, 1979). Photographic outlines of the ventricles were recorded at end-systolic and end-diastolic phases of contraction and these data were used to calculate the ejection fraction. Ejection fraction of at least 54% or more is considered normal, less than 54% indicates depressed heart function. The mean normal ejection fraction is 68% and mean for CAD patients is 57% (Bristow et al, 1970).

The Functional Classification of Heart Disease of the New York Heart Association (Freidberg, 1966, p. 241) provided a second comparison measure to perceived health. Persons with cardiac disease are placed in one of five classes

from Class I (best condition) to Class IV (worst condition), on the basis of symptoms occurring during various grades of activity. Class I indicates no limitation in physical activity. Class II indicates comfort at rest and with mild exertion, but presence of symptoms with more strenuous forms of ordinary activity. Class III implies marked limitation of physical activity with the experience of symptoms with even mild forms of ordinary activity. Class IV indicates an inability to carry on any physical activity without discomfort, and symptoms of coronary insufficiency or angina may be present even at rest. Patients at entry into this study were all in Class III. Subsequently, functional class was assessed by the physician at each clinic visit, and entered into the patient's record. The patient's classification nearest in time to the date of interview was used in this study.

The presence or absence of other chronic disease was determined by patient's statement of such (interview item 9). Duration of illness was calculated from the length of time between entry into the randomized study and the interview date, plus the patient's response to item 8, "How long before entry into the study were you aware you had a heart problem?" The method of treatment, medical or surgical, was also noted for the randomized grouping.

Design and Procedure

This is a descriptive and correlational study. Interviews were conducted with eligible and willing subjects

in clinic exam rooms at the time of their regular appointment. (See Appendix A for consent form.) The average length of time required for the interview was three hours. The MMPI was sent home with some subjects following careful instruction and demonstrated understanding. Return of this section in a preaddressed envelope was requested within one week. All but two forms were returned as requested.

Analysis

The first step in analysis was to generate a correlation matrix, showing the relationship of each variable to the dependent variable and each independent variable. Then those variables which were found to be correlated significantly (p .05) with the dependent variable were included in a step-wise multiple regression to assess the predictive values of these variables.

CHAPTER III

RESULTS AND DISCUSSION

This chapter presents both the results and discussion of the study and is divided into the following sections. First, the demographic characteristics of the sample are identified. Second, descriptive data on health related and psychological variables are presented. Third, the correlations between the dependent variable and independent variables are presented. Fourth, the results of the regression analysis describing the relative contributions of selected variables in explaining health perception are reported.

Demographic Characteristics

The study population consisted of 51 subjects, fairly evenly divided between the two hospital sources, with 22 from the Veteran's Administration Cardiac Outpatient Clinic and 29 from the University Clinic. Descriptive information of the subjects is presented in Table 1. The mean age of the group was approximately 54 years and the age range was 33 to 72 years. The population was predominantly male (94%) and married (92%).

The median family income for these patients was $6,084. According to the U.S. Bureau of the Census, in 1976 the

TABLE 1

DEMOGRAPHIC CHARACTERISTICS OF CAD PATIENTS

Characteristic	Values for the Subjects N=51
Age	
Mean	54.1
S.D.	7.1
Sex	
Male	48
Female	3
Marital Status	
Married	46
Divorced, single, separated, or widowed	5
Annual Income	
Median	$6,084
Range	$1,000 25,000
Education	
Mean	10.16
S.D.	3.01
Socioeconomic status[a]	
Mean	50.2
S.D.	6.9

[a]Green's Socioeconomic (SES) Index

median family income for Americans of their age category was $14,000. Thus this sample represented persons of a lower financial status, with many subsisting at the poverty level. The mean education was 10.2 years. The average person in the sample was a skilled or semi-skilled worker. These characteristics describe a working class population.

The Socioeconomic Index developed by Greene (1970) is a composite of income, occupation, and education. The mean for this sample was 50.2. The composite score was used later for statistical analysis.

Description of Health Related and Psychological Characteristics

Perceived Health

Perception of health (Cantril, 1965) was measured from 4 perspectives; one, "health right now", was used as the dependent variable of this study. The other subjective health measures were added for comparative purposes. The mean health rating of the total group for "health right now" was 5.2 (see Table 2) with scores ranging from a low of 2 to a high of 9. This mean may be compared to the mean of 7.2 reported by Garrity, Somes and Marx (1978) for a sample of college students. Considering the sample population characteristics, the higher mean for the students is not surprising. Of more interest to the present investigation is the mean of 3.9 reported by Hilles (1978) for 32 patients

TABLE 2

SUBJECTIVE MEASURES OF HEALTH OF CAD PATIENTS

Patient Perception of Health	Mean Score (N=51)	Standard Deviation
Current Health	5.2	1.6
Prior Health	2.8	2.2
Health of Average Person	6.5	1.5
Health of Sick Person	3.2	1.4

with chronic obstructive pulmonary disease (COPD). Apparently the cardiac patients had a better perception of their present health than did the COPD patients. On the measure of perceived health compared to health of others however, both groups of patients (CAD and COPD) judged the "average person" to be in better health than self, and the "sick person" to be in worse health than self. The most surprising similarity in the responses of the two groups was in the difference between the mean scores for the scale "health of a sick person" and the scale "health right now". COPD patients rated "health of a sick person" as 1.9 and "health right now" as 3.9 CAD patients rated "health of a sick person" as 3.2 and "health right now" as 5.2. Both groups rated themselves 2 points better than a sick person of their age. Both groups (CAD and COPD) also placed themselves approximately the same distance on the scale below "perceived health of an average person of the same age". Both samples are chronically ill and comparison to others is an important element in self ratings of health.

In summary this sample of cardiac patients perceived their health fairly positively. They saw themselves as significantly healthier than the sick person their age ($t = 8.7$, $p \leq .01$) and not quite as healthy as the average person their age ($t = 5.0$, $p \leq .01$).

The patients in this sample perceived their health as improved since entry in the randomized treatment study.

The mean score of perceived health before treatment was 2.8, compared to mean score at interview of 5.2. Previous health was viewed as even worse than that of a sick person of the same age. Conclusions must be drawn cautiously from this measure. The contrast may be inflated due to the retrospective view of previous health. As noted in Brown and Rawlinson (1979), there may be a need to justify one's suffering and thus a tendency to consider one's previous state of health as very poor. However, improvement in health perception is paralleled by the improvement in functional status which is reported in the following section.

Objective Health-Related Characteristics

"Objective" health measures were included in this study for the purpose of comparison with the subjective assessment of health. Included as measures of physical health status were the following: duration of illness, presence of other chronic disease, functional status according to the New York Heart Association classifications, and measures of left ventricular function (see Table 3). The majority of the group, almost 75%, had been aware of a problem with their heart for at least seven years. In addition to having a chronic heart condition, over half (59%) reported they had at least one other chronic illness. Consequently the majority of this group had a considerable history of compromised health.

For the majority of the group there was improvement in reported functional abilities. Assessment of current

TABLE 3

OBJECTIVE MEASURES OF HEALTH OF CAD PATIENTS

Objective Measures	Values (N=51)
Duration of illness (in months)	
Median	55.3
Range	15 - 420
Presence of other chronic illness	
Yes	30
No	21
New York Functional Class[a] (current)	
Class I	8
Class II	27
Class III	11
Class IV	2
Measures of Ventricular Function	
Ejection Fraction[b] (at 6 months)	
Normal 54%	34
Depressed 54%	10
Left Ventricular End-diastolic Pressure[b]	
Normal 15mmHg.	41
Moderate Elevation 15-20mmHg	4
Severe Elevation 20mmHg.	0

[a]Data available for 48 cases regarding New York Functional Classification.

[b]Data available for 44 cases on ejection fraction, and 45 on LVEDP.

physical activity and cardiac function showed that 73% of the 48 patients for whom data were available were placed in the New York Functional Classifications I and II, indicating improvement from their initial Class III status. As mentioned in Chapter II, Class I indicates no limitation of physical activity and Class II indicates that the person is comfortable at rest and with mild exertion, but shows symptoms with more strenuous ordinary activity. There were 23% who did not improve and 2 subjects were worse.

Measures of cardiac capacity at six months after entry into the study showed the majority to have normal ventricular function as determined by angiography. However measures of left ventricular function were also normal at entry for the majority. For detailed description of the cardiac capacity of this population, see Kloster et al (1979). Therefore these measures of heart function indicate no change in cardiac capacity in contrast to a perceived improvement in health status.

Thus in summarizing the physical status of the sample, subjects indicated a fairly long history of heart disease and over half reported the presence of other chronic illness. Nearly three-fourths of this sample showed improvement in functional classification during the course of observation and treatment, with nearly two-thirds indicating only slight limitation of activity. The measures of cardiac capacity which were within normal limits at entry showed no change during the course of the study.

Psychological Characteristics

In general the present sample had significantly elevated scores on the neurotic triad of the MMPI: depression, hysteria, and hypochondriasis. The psychological characteristics are summarized in Table 4. The mean scores of this sample were approximately two standard deviations above population norms. These findings are in agreement with the literature documenting the typical neurotic triad elevation among cardiac patients (Croog et al, 1968; Doehrman, 1977).

The mean scores on the Welsh Anxiety Scale did not differ substantially from norms. This was unexpected as the literature indicates anxiety as a common reponse to heart disease and myocardial infarction (Croog et al, 1968; Doehrman, 1977). However, it is compatible with the overall score of the Revised R-S scale which was not elevated in the direction of anxiety. It is conceivable that anxiety may have been present at an earlier stage in their illness which has since been dissipated or expressed in another form.

The Revised R-S scale (Byrne et al, 1963) of the MMPI indicates the person's characteristic mode of responding to threatening stimuli. Scores in this sample (mean, 44.2) were just slightly below the mean of the normative group, indicating a tendency toward repression. However, the present sample is slightly less repressive in response to

TABLE 4

PSYCHOLOGICAL CHARACTERISTICS OF CAD PATIENTS

Characteristics	Values for the Subjects N=49
MMPT Scales[a]	
Hypochondriasis	
Mean	74.4
S.D.	14.5
Depression	
Mean	69.8
S.D.	13.3
Hysteria	
Mean	71.3
S.D.	12.5
Anxiety (Welsh)	
Mean	51.1
S.D.	10.0
Repression-Sensitization (Byrne)	
Mean	44.2
S.D.	19.3
Cardiac Adjustment Scale[b]	
Mean	127.1
S.D.	13.3
Health Locus of Control[b]	
Mean	39.4
S.D.	6.1

[a] Means = T-scores.

[b] N=51

threat than another group of heart patients (mean 39.7) studied by Rawlinson (1970). The tendency toward repression is fairly well recognized in the literature as a favorable factor in the adjustment of heart patients (Croog, et al, 1971; Gentry, Foster, & Haney, 1972; Rosen & Bibring, 1966; Stern, Pascale & Ackerman, 1977).

Locus of control for this population was determined by Health Locus of Control (Wallston, Wallston, Kaplan, & Maides, 1976). It was designed to predict health related behaviors. The range of scores possible is 11 to 66. In this group of heart patients the mean score was 39.4 with a standard deviation of 6.1. These results may be compared to the following data cited by Wallston et al. For a group of community residents (N=101 and median age 35), the mean score was 35.9, standard deviation 7.1; and, for a group of outpatients with hypertension (N=38 and median age 51), the mean score was 40.1, standard deviation 6.2. Locus of control in Hilles's (1978) group of COPD patients was measured by this instrument. The mean for that group was 37.7. Thus the current sample of heart patients is fairly similar to the hypertensive group and the COPD patients, and very slightly more external than the community group.

The CAS was used as a measure of general psychological adjustment. The mean score was 127.1 for this sample. This is similar to the mean score of 126.4 reported for the original test group (Rumbaugh, 1964). Thus the average

person in the present sample received a score at the 51st percentile according to the normative data from Rumbaugh's sample. This places the sample in an average range between very poor and the best possible adjustment attitudes.

In summary these data describe a group of CAD patients whose functional health status improved after treatment and who perceive themselves to be improved and moderately healthy. Psychologically they were in a middle range between poor and best adjustment attitudes for heart patients. A measure of locus of control indicated this population tended to be in the middle range indicating neither internality nor externality. Scores on the MMPI indicated considerable psychological problems among the individuals in this sample. When compared to "normal" Americans these heart patients were more depressed, more concerned with body and more preoccupied over health. They also showed an exaggerated need to appear well to others.

Health Perception in Relation to Selected Demographic, Health Related and Psychological Variables

The zero-order correlations of perceived health with all the demographic, physical and psychological variables listed above are presented in Table 5. The correlations were calculated in order to select variables which significantly correlated with health perception for entry into the regression analysis. The correlation matrix also was useful in examining other significant relationships among the variables. The Cardiac Adjustment Scale was the strongest

TABLE 5

INTERCORRELATIONS AMONG THE VARIABLES

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Age	-	.24	-.58**	.10	.29	-.01	-.19	-.06	.33*	.29*	-.07	.00	.38*	.10	.01	-.14	-.24	-.37**	.10	.11	-.44**
2. Sex[a]		-	-.04	.24	.12	-.09	.08	.14	-.07	-.13	.07	-.06	.30*	.07	-.25	-.18	-.13	-.05	.04	.09	-.30*
3. SES			-	-.01	-.14	.10	.26	.18	-.25	-.06	-.01	-.04	-.03	-.24	.11	-.06	.28*	.42**	-.28*	-.33**	.27*
4. Marital Status[b]				-	-.04	-.01	.05	-.09	-.06	-.05	.07	-.12	.01	-.11	.03	-.08	-.11	-.18	-.01	.02	-.22
5. Current Health Perception					-	.09	.30	.26	.31*	-.14	-.20	.04	.17	.02	.42**	-.30*	-.41**	-.26	-.10	-.17	-.05
6. Prior Health Perception						-	.11	.34*	-.18	-.05	.25	-.42**	.01	.27	.30*	.17	.08	.10	-.32*	-.25	-.18
7. Health of Average Person							-	.18	-.08	-.04	.03	-.08	-.04	.10	.20	-.01	-.14	.11	-.23	-.23	.24
8. Health of Sick Person								-	.11	-.22	.22	-.25	.28	.06	.09	.01	.09	.23	-.25	-.22	.03
9. Duration of Illness									-	-.17	-.06	.18	.26	.03	.16	-.23	-.10	-.13	.04	.04	.03
10. Presence of Other Chronic Illness										-	.10	.21	.15	-.14	-.12	.19	.22	.27	-.10	-.00	-.06
11. New York Functional Classification											-	-.24	-.14	.18	-.12	.19	.22	.27	-.10	-.00	-.06
12. Treatment Method[c]												-	-.07	-.21	-.00	-.19	-.04	.05	-.09	-.11	.13
13. Left Ventricular End-Diastolic Pressure													-	.12	-.09	-.15	-.09	-.08	-.06	-.08	-.30*
14. Ejection Fraction														-	.07	.21	.07	.05	.11	.08	-.12
15. Cardiac Adjustment Scale															-	-.40**	-.27**	-.17**	-.55**	-.61**	-.04
16. Depression																-	.49**	.59**	.40**	.43**	.20
17. Hypochondriasis																	-	.78**	.09	.21	.21
18. Hysteria																		-	-.03	.01	.30*
19. Anxiety																			-	.95**	.08
20. Repression-Sensitization																				-	.06
21. Health Locus of Control																					-

[a]Coding for sex: 1=male; 2=female.

[b]Coding for marital status: 1=married; 2=divorced, single, widowed or separated.

[c]Coding for treament: 1=medical; 2=surgical.

* = .05

** = .01

correlate of health perception ($r = .42$, $p \leq .01$), followed closely by hypochondriasis ($r = .41$, $p \leq .01$). Duration of illness, depression, age, and perception of the health of one's age peers were also significantly related to health perception ($p \leq .05$ in all cases). In the following sections the variables will be discussed in relation to health perception according to these categories, demographic, health-related and psychological.

Demographic Variables and Health Perception:

Of the demographic variables employed only age showed significant correlation with health perception ($r = .30$, $p \leq .05$). The positive correlation with health perception indicated that the older heart patient was more likely to have a positive perception of his health than the younger heart patient. This is contrary to the theoretical speculations of Ware et al (1978) that less favorable self health ratings would be associated with increasing age. General support in the literature was cited for this hypothesis. The data of the present investigation however, support Maddox (1964) who found that older males were more optimistic about their health than the younger subjects. Optimism was defined as perception of health as good in spite of medically evaluated poor health. Tornstram (1975) noted similar results indicating that as age increases, satisfaction with actual health status occurs even as health declines. In other words, "aspiration levels" regarding

health decrease with advancing age. Tornstram hypothesizes that aspiration level may have a strong influence on perceived health status. Rosen and Bibring (1966) described a similar reversal in older heart patients with regard to depression and denial. They noted the normal aging process as part of their explanation: the older individual has resolved conflicts that might result in depression. Using similar reasoning it may be speculated that the older heart patient has had the opportunity to adjust to the condition and to have resolved some of the conflicts involved in role change. Thus his perception of his health may be more positive than that of the younger heart patient.

Correlations of health perception with socioeconomic status for this sample were not significant as has been identified by Maddox (1962, 1964). This group tended to be homogeneous with regard to socioeconomic status and thus lacking variability, socioeconomic status may have been prevented from showing a significant effect.

Health Related Variables and Health Perception

Objective and Subjective Measures

Based on the review of literature, measures of physical health status were expected to be highly correlated with perceived health (Freidsam & Martin, 1963; Maddox, 1962, 1964; Suchman et al., 1958). However, from the category of objective measures in the current investigation, only duration of illness was significantly correlated with perceived

health ($r = .31$, $p < .05$). The longer a person had been ill, the better his/her health perception was likely to be. Logically one might expect exactly the reverse to be true. In explanation, allowing time for adjustment to a dramatic health change and to new roles may allow the individual to view his/her health in a fairly positive light. Although the measures of functional ability for this population indicated improvement, they were not significantly related to health perception.

The present investigation does not show significant associations between health perception and the presence of other chronic conditions. Mechanic (1974) and Ware et al. (1978) reported that the number of other chronic conditions was significantly associated with health perception. Severity and duration of disability have been shown to be predictive of health perception (Wan, 1976), as were measures of functional capacity (Tissue, 1972). Although Tissue's study showed that self ratings were positively correlated with objective measures of health, the self ratings were most closely related to subjective variables; the perception of health is stable, as superior to that of one's age peers, ans as a minimal source of worry. These features of "subjective response to health" as Tissue labels them, are roughly comparable to the variables in the current investigation of duration of illness (stable state of health), health of an average person of the same age, and the hypochondriasis scale; all of which were significantly related to health perception.

Tissue's findings plus others reported in Ware et al (1978) indicated a strong association between health perception and the view that one's health is superior to the health of one's age peers. In the present investigation, the perceived health of the average person one's age is significantly related to perception of one's own health ($r = .30$). Subjects in this sample, however, did not view their health as superior to that of the average person. It would be quite unrealistic of CAD patients to do so. Still, this sample's view of their health is related to their view of the health of others their age. Bem (1972), citing Festinger (1954) theorized that the formation of self perceptions is based on evaluative needs or social comparison processes which lead an individual to seek an appropriate label and explanation for otherwise ambiguous internal states. This theory also implies that it is more adaptive to see oneself as not too different from others.

Psychological Variables and Health Perception:

The review of literature indicated that psychological factors and attitudes are strongly associated with perception of health (Freidsam & Martin, 1963; Maddox, 1962, 1964; Suchman, Phillips, & Streib, 1958; Tissue, 1972; Ware et al, 1978). The present study confirmed that indication: the CAS showed the strongest correlation with health perception ($r = .42$, $p \leq .01$), and hypochondriasis followed ($r = -.41$, $p \leq .01$). Depression was also significantly correlated ($r = -.31$, $p \leq .05$).

Although the exact definition of the psychological characteristics and traits measured by the CAS is not known, the features of objectivity, co-operativeness, and emotional stability are generally recognized as psychological traits assessed by this tool. Identification of the other variables in the present sample that are significantly related to CAS gives some clues to the specific characteristics of this sample. In general the matrix shows that those with poor adjustment attitudes may be characterized as sensitizers who are anxious and depressed. These variables have been previously documented as psychological characteristics which are a liability in the adjustment of heart patients. Maddox's study (1964) adds support to these findings by showing that good adjustment to illness is associated with positive perceptions of health.

The present data show the significant correlations of health perception with depression and hypochondriasis. This relationship has been shown by others (Maddox, 1962, 1964; Tissue, 1972), although the methods of measurement vary. Several of the previous investigations have measured general happiness, morale, and preoccupation with or apprehension over health. These factors can be considered similar to depression and hypochondriasis. However, according to the description of hypochondriasis as measured by the MMPI, this scale includes the tendency to acknowledge vague complaints and to deny good health.

The measures of repression-sensitization and anxiety, although major psychological factors in response to heart disease and recovery, did not show a direct relationship to health perception in the present study. They may exert an indirect effect on health perception however, through the patient's attitude toward the illness as measured by CAS.

Results of a Step-Wise Multiple Regression Analysis

Exploration of the effect on the dependent variable of each significantly correlated predictor variable was accomplished by means of multiple regression analysis. This technique allows for the assessment of the influence of each predictor variable on the dependent variable while the influence of the others is controlled. The order of importance of the predictor variables can also be determined using this procedure.

Six variables were significantly correlated with health perception. Depression and hypochondriasis were highly correlated with each other. To avoid redundancy, only hypochondriasis was chosen for inclusion in the regression. The results of this analysis are presented in Table 6.

A multiple correlation coefficient (R) of .635 was obtained when the simultaneous effects of all five variables on health perception were assessed. The regression equation reveals that CAS, by virtue of its high correlation with

TABLE 6

STEP-WISE MULTIPLE REGRESSION OF FIVE VARIABLES IN RELATION TO HEALTH PERCEPTION (N=51)

Variable	Multiple Correlation	Cumulative Variance	Beta Coefficient
Cardiac Adjustment Scale	.421	.178	.275
Hypochondriasis	.519	.269	-.222
Duration of illness (in months)	.565	.319	.187
Health of average person your age	.605	.366	.265
Age	.635	.403	.216

health perception, accounts for most of the explained variance, 17.8%. Hypochondriasis, duration of illness, and perceived health of one's age peers emerged in that order and accounted for an additional 18.8% of the explained variance. Adding the effects of age, only 3.7% more variance is accounted for and thus a total of 40.3% of the explained variability in health perception is accounted for by this set of five variables.

Garrity, Somes and Marx (1978) obtained similar results in a college population where 17.6% of the explained variance in perceived health was accounted for by psychophysiologic distress, as measured by Langner's index, (1962). Langner's index in part measures emotional disturbance and general adjustment. They found other health related variables to be significantly correlated with health perception, i.e. life change, perceived stress, and recent health. However, only recent life change added significantly to the explained variance in perceived health. The total explained variance was 20%, which is just half of the explained variance in the current study. This large difference may be understood in light of the impact of recent life change, recent health, and perceived stress in the lives of heart patients. Though these factors were not measured as such, they may be subsumed in the general adjustment and psychological measures of CAS and the MMPI scales.

In the present study, the two variables with the strongest influence on health perception, as indicated by

the beta coefficients, are CAS and perceived health of one's age peers. The beta coefficients indicate the contribution of each variable to the variance in health perception while the effects of the others are held constant.

These results may validate suggestions by Ware et al. (1978) that the perceptions of the health of others and one's own self perceptions of health may be part of the same construct.

The strong influence of CAS indicates that the attitudes tapped by this scale are associated with self-perceived health. Thus the attitudes one holds about having a heart condition seem to strongly influence his view of his health. The more powerful influence of attitudes on health perception over the influence of physical status was also illustrated by Garrity et al. (1978) and Tissue (1972). The significant attitudes described in the present study and in Tissue and Garrity et al. are attitudes related to health.

The regression analysis indicated the importance of attitude toward heart disease in influencing the health perception of persons with CAD. Nurses are in an excellent position to influence the attitudes of patients. Through the nurse-patient relationship in exchanging information and sharing the illness experience, the patient may have the opportunity to reexamine and reform attitudes and meanings of the illness in his/her life.

In conclusion positive health perception among this sample of heart patients may be predicted by the following variables: positive attitudes about heart disease including general optimism and cooperativeness, minimal bodily concern, older age, extended duration of illness, and little discrepancy between the perception of the health of others of the same age and the perception of one's own health. In addition, the beta coefficients demonstrated that attitudes about heart condition and the views of the health of other's when taken singly, have the strongest influence on health perception for this population.

Finally, mention should be made of the limitations of this study. Although the physical variables did not account for any significant variance in perceived health, the influence of physical status may have been obscured by the particular measures chosen. Also variability of physical status was minimal in this sample of CAD patients. Results of this study are applicable only to the population sample investigated. This sample was a select group of CAD patients representing a limited segment of the larger CAD population. This sample was selected in part based on specific disease criteria.

It should be noted that this investigation does not present a cause and effect relationship between health perception and predictor variables. This was a correlational study. The causal links in the theoretical framework have

not been addressed and will require more comprehensive examination.

CHAPTER IV

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

Self perception of health is coming to be recognized as an important variable in predicting health and illness behavior. Perceived health has been considered as an indicator of clinically measured health and as an intervening variable influencing post-illness adjustment. Greater knowledge of the determinants of self-perceived health is needed to better understand and control the process through which perceived health influences health and illness behavior. The present research focused on physical, social, and psychological correlates of perceptions of health.

The subjects in this study included 51 outpatients (48 male and 3 female) with coronary artery disease aged 33 to 72 years. This population had been selected for prospective investigation of medical and surgical treatment techniques of CAD. By means of interview and health record review, data were collected concerning various characteristics of the sample. These characteristics served as independent or predictor variables in the analysis. The relationship of the dependent variable, perceived health, to these characteristics was described and each was analyzed for its predictive power on perceived health.

The chronically ill patients in this sample expressed a fairly positive perception of their health. They perceived themselves as less healthy than the average person their age, yet considerably healthier than sick persons their age. The older subjects tended to have a more positive health perception than younger subjects. Measures of cardiac capacity did not distinguish this sample from normal. Other measures of objective health status described a sample with a history of compromised health and slightly limited activity. This basically working class sample of heart patients displayed many of the psychological characteristics of other heart patients, namely elevations of the neurotic triad of the MMPI: depression, hypochrondriasis and hysteria. This sample did not display extraordinary anxiety which is common among heart patients.

In this correlational study all independent variables were examined for their relationship to the dependent variable. Those showing a statistically significant relationship with the dependent variable were chosen for inclusion in the stepwise multiple regression analysis. Contrary to earlier evidence cited in the literature, physical measures of health for this sample were not highly correlated with health perception. However, the literature also supports the importance of subjective factors in determining perceived health.

In general perceptions of health in this study were significantly correlated with subjective features of

experience. The indirect physiological measures of age and duration of illness also showed significant correlations with perceived health. Psychological adjustment to heart disease was significantly correlated with health perception, as were hypochondriasis and depression. Hypochondriasis and depression were also significantly correlated to one another and in order to avoid redundancy in the regression analysis, only hypochondriasis was chosen for inclusion. Perception of the health of one's age peers was also significantly correlated with perceived health, and included in the regression. Approximately 40% of the variance in health perception was accounted for by the following 5 variables: attitude toward heart disease as measured by the Cardiac Adjustment Scale; hypochondriasis from the MMPI; duration of illness; perception of the health of one's age peers; and, age.

Conclusions

The patients with coronary artery disease in this study did not perceive themselves as sick people even though they had a chronic illness. Their perceptions of their health also indicated that they realistically viewed themselves as slightly less healthy than the average person their age. The attitudes of this sample toward their illness strongly influenced their perceptions of their health. Psychological factors accounted for a major portion of the explained variance in perceived health.

Findings in the present study indicated that the older heart patient who has had the condition for a longer time also had a more positive health perception. The new and young heart patient may be at a critical point where appropriate interventions might assist in the development of beliefs, attitudes and goals that would lead to more favorable outcomes.

Health professionals and nurses particularly are in an excellent position to affect the attitudes of patients toward their illness and thus also the patient's perception of his/her health. Emphasis on these aspects of illness may benefit the patient's recovery more than previously believed.

Recommendations

In order for this variable, perceived health, to be useful in health related fields, further study is recommended. The correlates of perceived health should be explored in other medical categories with various degrees of illness and disability to see if the results of the present study are substantiated. A random sample drawn from the general population might also provide useful data about the factors influencing perceived health. A well-conceived longitudinal study would be particularly useful in showing the impact of illness on health perceptions.

Relative to heart patients particularly, the identification of the components of the Cardiac Adjustment Scale would be beneficial. Identification of the attitudes tapped by this scale would allow nurses to focus on more precise beliefs in trying to effect changes in attitude and hopefully in perceptions of health.

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APPENDIX A

CONSENT FORM FOR HUMAN RESEARCH

Consent for Human Research Project

I, _____
(First Name) (Middle Initial) (Last Name)
herewith agree to serve as subject in the investigation named, Rehabilitation of Medical Versus Surgical Coronary Artery Disease Patients, under the supervision of Dr. Rawlinson. The investigation aims at finding those factors which affect the quality of life of patients who have coronary artery disease.

It is my understanding that I will be required to answer questions to paper and pencil tests. The questions relate to life-satisfaction, work status, social participation, and family functioning. The time required of me is about three hours.

All information that I give will be handled confidentially. My annonymity will be maintained on all documents, which will be identified by means of code numbers.

I may not receive any direct benefit from participating in this study but understand that my contribution will help expand the degree of knowledge in regard to the rehabilitation of persons who have coronary artery disease.

_____ has offered to answer any questions I might have about the tasks required of me in this study.

I understand that I am free to withdraw from participation in the investigation at any time without this decision otherwise affecting my medical treatment.

I have read the above explanation and agree to participate as a patient in the study described.

Signature _____

Witness _____

Date _____

APPENDIX B

INTERVIEW SCHEDULE

Identification No. _____ Please check ( ) your answers.

1. Sex: Male Female

2. Date of Birth Age: (at last birthday) _____

3. Present Marital status (check)

   1. Married: living with spouse
   2. Married: not living with spouse
   3. Divorced or separated legally
   4. Widowed
   5. Never married

4. Highest grade of school completed (circle)

   1 2 3 4 5 6 7 8 9 10 11 12
   College: 13 14 15 16
   Postgraduate 17+ Highest degree attained:

5. What was your occupation before your heart operation? (If housewife, state so. If not, give the title of your position, and state the general duties of the job.)

6. Would you classify your usual occupation as:

   _____1. Professional
   _____2. Manager or owner of business
   _____3. Farmer (owner or manager of at least 100 acres)
   _____4. Clerical, sales, technician
   _____5. Skilled, craftsman, foreman
   _____6. Operative, semi-skilled
   _____7. Service worker
   _____8. Unskilled
   _____9. Farm labor (owner of less than 100 acres)
   ____10. Housewife

7. Would you please try to estimate your total income (including spouse's income, if any) from all sources for the past 12 months?

   1. $50,000 or more
   2. $25,000 to $49,999
   3. $15,000 to $24,999
   4. $12,000 to $14,999
   5. $10,000 to $11,999
   6. $9,000 to $9,999
   7. $8,000 to $8,999
   8. $7,000 to $7,999
   9. $6,000 to $6,999
   10. $5,000 to $5,999
   11. $4,000 to $4,999
   12. $3,500 to $3,999
   13. $3,000 to $3,499
   14. $2,500 to $2,999
   15. $2,000 to $2,499
   16. $1,500 to $1,999
   17. $1,000 to $1,499
   18. Less than $1,000

8. How long before your heart operation were you aware that you had a heart problem?

   1. Less than 1 month
   2. 1 to 3 months
   3. 3 to 6 months
   4. 6 months to 1 year
   5. 1 to 2 years
   6. Over 2 years (specify how long)

9. Besides your heart problem, do you have any other chronic diseases, health problems, or disabilities (such as diabetes, arthritis, cancer, kidney problems, etc.)

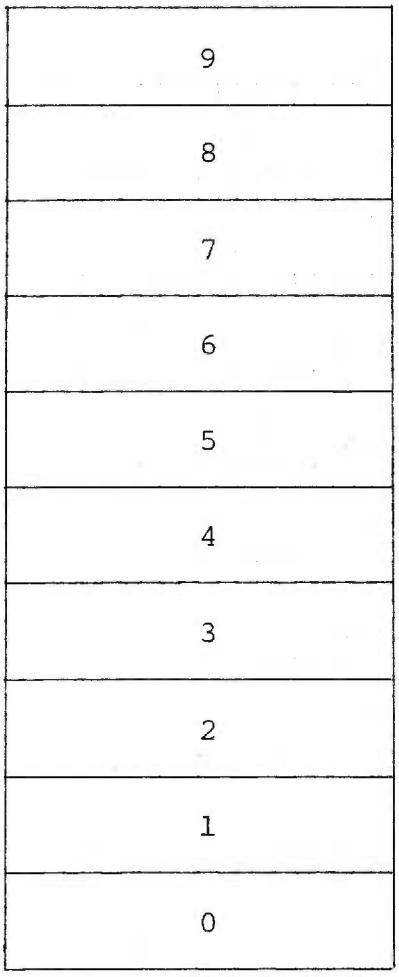
   1. No
   2. Yes (please specify what these problems are)

APPENDIX C

CANTRIL LADDER

FOR HEALTH PERCEPTION

(Cantril, 1965)



Above is a picture of a ladder. Suppose we say that the top of the ladder represents perfect health, and the bottom represents the most serious illness.

On which step would you say your health is <u>right</u> now? _____ (Please write down the number of the step)

On which step would you say your health was a month <u>before</u> your first heart operation? _____

On which step would you say the health of the <u>average person</u> your age is? _____

On which step would you say the "sick person" your age is? _____

(Please try to answer these even if they are "educated guesses".)

APPENDIX D

HEALTH LOCUS OF CONTROL

(Wallston, Wallston, Kaplan, & Maides, 1976)

Health Locus of Control Scale

To what extent would you agree or disagree with each of the following statements:	1 Strongly Disagree	2 Moderately Disagree	3 Slightly Disagree	4 Slightly Agree	5 Moderately Agree	6 Strongly Agree
1. If I take care of myself, I can avoid illness.						
2. Whenever I get sick it is because of something I've done or not done.						
3. Good health is largely a matter of good fortune.						
4. No matter what I do, if I am going to get sick, I will get sick.						
5. Most people do not realize the extent to which their illnesses are controlled by accidental happenings.						
6. I can only do what my doctor tells me to do.						
7. There are so many strange diseases around, that you can never know how or when you might pick one up.						
8. When I feel ill, I know it is because I have not been getting the proper exercise or eating right.						
9. People who never get sick are just plain lucky.						
10. People's ill health results from their own carelessness						
11. I am directly responsible for my health.						

APPENDIX E

CARDIAC ADJUSTMENT SCALE

(Rumbaugh, 1964, 1966)

CARDIAC ADJUSTMENT SCALE

by
Duane M. Rumbaugh

NAME _____ AGE ____ SEX ____

PERMANENT ADDRESS _____

CURRENTLY EMPLOYED YES ____ NO ____ PRESENT OCCUPATION _____

INSTRUCTIONS

This scale has been devised in order to gain a better understanding of cardiacs.

It is NOT a test which can be passed or failed. There are no "right" or "wrong" answers. Therefore, you should not hesitate to freely record your reactions to the items.

Please keep the following points in mind as you take this scale:

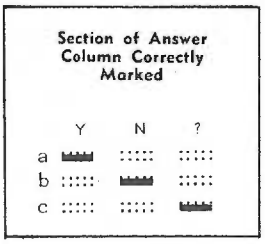
Read and answer EACH item in the scale. It is important that you respond to all of them.

Answer each item quickly with your first reaction after having read the item. You should be able to complete the entire scale in approximately fifteen minutes.

All items are to be answered "Yes", "No", or "?" by blackening in the space under the column headed "Y" for "Yes", "N" for "No", or "?".

If a given item is either wholly or for the most part TRUE of you, you should blacken the space under "Y" for "Yes" as in example item "a" in the box to the right.

If a given item is either wholly or for the most part NOT TRUE of you, you should blacken the space under "N" for "No" as in sample item "b".



If you can not truthfully respond with either a "Yes" or "No" answer, you should blacken the space under "?" as in sample item "c". The "?" answer means "I don't know" and should not be used any more than absolutely necessary.

Be sure to answer every question.

EDUCATIONAL AND INDUSTRIAL TESTING SERVICE SAN DIEGO, CALIFORNIA 92107

AN ABSTRACT OF THE THESIS OF

JULIANE D. McKIM

For the MASTER OF NURSING

Date of Receiving this Degree: June 8, 1980

Title: FACTORS INFLUENCING PERCEIVED HEALTH STATUS OF PATIENTS WITH CORONARY ARTERY DISEASE

Approved: [redacted]

May Rawlinson, Ph.D., Professor, Thesis Advisor

Self perception of health is coming to be recognized as an important variable in predicting health and illness behavior. Perceived health has been considered as an indicator of clinically measured health and as an intervening variable influencing post-illness adjustment. Greater knowledge of the determinants of self-perceived health is needed to better understand and control the process through which perceived health influences physical, social, and psychological correlates of perceptions of health.

From a population sample of 51 outpatients with coronary artery disease selected physical, social and psychological characteristics served as independent, or predictor variables to the dependent variable of health perception. In this correlational study each independent variable was examined

ABSTRACT OF THESIS CONTINUED

for its relationship to health perception and those showing a statistically significant relationship with health perception were included in a stepwise multiple regression analysis.

Contrary to earlier evidence cited in the literature, physical measures of health for this sample were not highly correlated with health perception. Several subjective factors showed significant correlation with health perception. Results of the regression analysis showed the following 5 variables to be predictive of health perception: attitude toward heart disease as measured by the Cardiac Adjustment Scale; hypochondriasis from the MMPI; duration of illness; perception of the health of one's age peers; and, age. The Cardiac Adjustment Scale was the strongest predictor of perceived health.

Recommendations for further study were made.