ALIENATION AND SOCIAL LEARNING AMONG PATIENTS WITH HEART DISEASE

by

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B.Sc.N, University of Western Ontario, 1964

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Anthropology and Sociology

Accepted for the
Faculty of Graduate
Studies

[redacted]

Dean pro tem
4 May, 1971

We accept this thesis as conforming
to the required standard

[redacted]

UNIVERSITY OF VICTORIA

APRIL 1971

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Abstract

When personal alienation is defined as perceived powerlessness to control one's fate in critical life situations, it is presumed to act as a deterrent to relevant social learning and hence to active control of events. The present study attempts to relate the differential feelings of powerlessness of patients with acute coronary heart disease to their learning about their illness and the influence of this knowledge on their compliance to a medical regimen and on their post-illness adjustment.

Thirty-eight male patients with acute coronary heart disease participated in the study. Data were collected by means of personal interviews using a structured schedule of questions. Nineteen subjects (the comparison group) received varying but essentially incidental health instruction. They were interviewed two to four weeks following discharge from hospital. The remaining nineteen treatment subjects were exposed while in hospital to an experimental health education program and subsequently interviewed at the time of discharge and again from one to three weeks later.

It was hypothesized that subjects lower in alienation would have greater knowledge about their illness and its management, would show greater compliance to the medical regimen and hence would experience less post-coronary disability.

Results were first analyzed using the Kendall Rank Correlation Coefficient (r) which indicated a stronger negative

relationship between alienation and knowledge in the comparison group; and likewise between compliance and post-coronary disability in the treatment group. A stronger positive relationship between knowledge and compliance obtained for the comparison group. While lending some support for the proposed hypotheses, none of the correlations was statistically significant. Thus it was further hypothesized that the experimental program rather than alienation was more influential in effecting positive increases in knowledge and compliance, while reducing post-coronary disability in the treatment subjects. Scores for both groups were dichotomized at the median for the combined groups, and between-group differences were analyzed using the Chi Square Test. Differences between the two groups on the three variables were all statistically significant ($<.05$) in favour of the treatment group. Methodological limitations such as a unidimensional alienation scale, time differences in collecting data from the two groups, and the active participation of the researcher in the experimental project are thought to account, at least in part, for the marked differences observed between comparison and treatment groups.

Results of the study do not lend strong support for the proposed influence of alienation on social learning in this group of patients, but there is stronger evidence that when coronary health instruction is comprehensive and prescriptions clearly defined, patients tend to learn more about their illness, comply more readily to recommended control measures and experience less post-coronary role disability.

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ACKNOWLEDGEMENTS

I am particularly grateful to Professor Clyde Pope, my academic advisor, for his continuing guidance and encouragement throughout my graduate work and especially for supervising this study. Thanks are due also to Professors Roy Watson and Ronald Hoppe, the remaining members of my academic committee, for their assistance in reading drafts of the thesis and suggesting revisions.

My sincere appreciation is expressed to Doctor George Woodwark, chief cardiologist at the Royal Jubilee Hospital, who invited me to participate in the pilot project on the systematic education of coronary patients, who supervised the therapeutic aspects of the program, and made research funds obtained from the British Columbia Heart Foundation available to me during the past year.

A special debt of gratitude is due to my friend and colleague, Carole Sisskind, professional dietitian, for the countless ways in which she assisted me during the project.

Thanks are due to all the physicians who encouraged their patients to participate in the project as comparison or treatment subjects; to nursing and physiotherapy colleagues for their assistance and to all other staff members of St. Joseph's and the Royal Jubilee Hospital who were indirectly involved.

Finally, I wish to express my appreciation to all the patients who participated in the study. Their teaching of life lessons to me has been invaluable and I hope that our efforts on their behalf have been beneficial to them.

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CHAPTER I

CORONARY HEART DISEASE AND THE RESEARCH PROBLEM

Coronary heart disease, North America's number one killer, is currently the object of focussed attention from the world of scientific medicine. Despite increasingly sophisticated treatment methods and facilities and a growing array of specialists, the incidence of the disease continues to rise unabated. The resulting dilemma is succinctly expressed in the following notation by the Subcommittee on Communications, the President's Commission on Heart Disease, Cancer and Stroke (1965:403):

> The prevention and control of heart disease begins not with the doctor, the hospital or the medical center. It begins with the individual himself, on the decisions he makes and most of all on the state of his knowledge about health matters.

Researchers in medical sociology have been prompted to seek out and explicate the various social factors which influence persons to make differential decisions regarding illness. Basic to the sociological perspective is the premise that sick people are engaged in networks of social relations that can advance or deter their recovery and eventual rehabilitation.

This study seeks to clarify the variants of a cardiac patient's acquired learnings about his illness and the possible effects of this knowledge on his recovery. The concern is with the sick person's perceived power to influence the course of events in his life. The specific question posed is whether a generalized sense of powerlessness is reflected in a person's response to an acute episode of coronary heart disease including

the extent to which his learning about his illness is affected. It is assumed that the quality of learning will influence his compliance to the medical regimen and consequently the actual outcome of the illness. The study is linked theoretically to the alienation-social learning theme developed by Melvin Seeman (1959, 1962, 1963, 1967).

According to the latest available statistics (1966), ischemic heart disease[1] claims more than 40,000 lives yearly in Canada and over 500,000 in the United States. It is estimated that approximately fifty percent of these deaths are 'premature', that is, occurring before the age of 65 years. Trends in world wide death rates due to heart disease for the period 1950 to 1966 increased from 178 per thousand to 251 per thousand, with a range of 36 in Singapore to 413 in West Berlin (World Health Statistics Report, 1969). Thus ischemic heart disease is a phenomenon of increasingly serious proportions and appears linked with societies most advanced in industrialization, urbanization and affluence.

The basic disease process affecting the coronary arteries is called atherosclerosis where fatty materials deposit as plaques along the inner lining of these vessels thus narrowing the lumen. If the lumen is narrowed to the point where arterial blood flow becomes insufficient for the demands of the heart muscle (myocardium), then coronary artery disease is said to exist. Only two small arteries and their branches supply the heart muscle with blood, therefore any significant interference with the flow through these vessels can impair the entire function of the heart.

No specific cause of coronary atherosclerosis has been discovered though it is the object of much speculation. There are at present two main theories attempting to explain the disease (Meltzer et al., 1969). First, there are some who believe it is a reflection of the stresses of our society. In some unexplained manner these tensions are thought to induce certain biochemical or physical changes which ultimately result in atherosclerosis. If valid this theory could account for the higher rates of coronary artery disease in the United States, Canada and Western European countries as compared to less industrialized nations such as Korea and Malaysia. Secondly, there are those who believe that these differences may be better explained on the basis of variations in the diet between these societies with special reference to animal fats. Thus the richer the country, the larger the fat consumption, the higher the serum cholesterol levels, the greater the incidence of atherosclerosis and coronary artery disease.

Both these theories are essentially unproven being founded as they are on circumstantial evidence. However the following observations regarding atherosclerosis and coronary artery disease have been substantiated repeatedly:

(a) Persons with diabetes, regardless of the degree of control, have at least a fourfold increase in the incidence of coronary artery disease. This evidence suggests that a biochemical disturbance may be central to the background of atherosclerosis;

(b) Coronary artery disease is uncommon in women during the childbearing years but once the menopause is reached the incidence rises rapidly and then equals the rate for men.

This pattern is quite unlike that of males in whom gross evidence of atherosclerosis may exist at young - 18 to 25 - ages. Such an age-sex discrepancy allows speculation that a hormonal influence may be important in the disease.

Furthermore, a series of factors have been identified as common to most but not all persons with coronary artery disease. While there is no specific evidence that any of these factors cause atherosclerosis, persons who have some or most of these conditions are high risk candidates for the disease; and conversely the absence of these risk factors predicts little likelihood of developing coronary artery disease.

Variables associated with a high incidence of coronary heart disease fall into three categories - physiological, psychological and cultural - with fairly substantial evidence that heredity plays an important role.

Data in support of the familial nature of the disease, for example, were obtained from the Coronary Research project at the Massachusetts General Hospital (Gertler & Whiter, 1966). Positive family histories were significantly greater in the parents and siblings of the men in the coronary-prone group than in the parents and siblings of the men in the non-coronary-prone group. Such data, however, do not differentiate between genetic and cultural transmission. For example, hyperlipidemia (excessive quantity of fat in the blood) found very frequently in persons with coronary artery disease can be either hereditary or culturally related to diets high in animal fats. Clarification of the above distinction is progressing with current research into the various types of hyperlipidemias.

A second notable heredity-based variable is body build. The Massachusetts study, for example, demonstrated that the young "pure" coronary individual is predominantly mesomorphic. He weighs approximately the same as his non-coronary counterpart but is shorter and hence a more compact individual of different body build (Gertler and Whiter, 1966).

Efforts to identify purely psychological correlates of coronary heart disease have met with unequal success. The possibility that patients with acute myocardial infarction[2] will display certain personality characteristics that can be used to distinguish them from non-cardiacs was investigated by Norman R. Atland (1965). A selected group of patients, matched for eight control variables, were tested by means of a special 90-item form incorporating the GR & E factors of the Guilford-Zimmerman Temperament Survey. The analysis failed to produce evidence in support of the hypothesis.

However some clinicians possibly inspired by Hans Selye's (1956) now classic thesis on the role of stress in the etiology of disease have attempted to relate the stress theory specifically to coronary heart disease. Friedman and Rosenman (1966) upon review of the epidemiological literature and a re-examination of their own patients have found that the younger and middle-aged victims of coronary heart disease very frequently exhibited a personality structure which they have since defined as "Behavior Pattern Type A". This overt behavior pattern is primarily characterized by certain personality traits including aggressiveness, ambition, drive, competitiveness and a profound sense of time urgency. The man with Pattern A thus exhibits traits present in most normal men but he possesses

them to an excessive degree. He also frequently exhibits certain typical muscular or motor phenomena including forceful, rather rapid and often explosively uneven speech, sudden gestures such as fist-clenching, desk-pounding, taut facial grimaces and rapid movements and locomotion reflecting his chronic sense of restlessness and impatience. In particular the man with Pattern A appears often to be excessively driven to achieve and to get things done while being unable to overcome the inflexible factor of time itself and frequently struggling against the competing and obstructing influences of other persons and things. This latter phenomenon has been aptly termed by another clinician as "The Nutcracker Syndrome" (Wolffe, 1966). Pattern A is seen by the authors as an interplay of certain personality and certain environmental factors existing in our modern urban milieu and its socioeconomic stresses. Pattern B has been designated as the relative absence in excessive degrees of the characteristics described for the coronary-prone personality.

There is a good deal of speculation that further aspects of modern affluent living may have negative effects on cardiovascular health: for example, patterns of relative physical inactivity, consumption of foods rich in animal fats and proteins, high consumption of alcoholic beverages and coffee, and, above all the high incidence of excessive cigarette smoking. Studies in Canada, Great Britain and the United States have shown that on the average the total death rate is about 10% higher among male cigarette smokers than non-smokers (Resource Guide on Smoking, 1966). Samuel Bellet (1966) in a series of well-documented experiments using dogs and human subjects

found that smoking in humans and nicotine injections in dogs caused a rapid and consistent rise in serum free fatty acids. Patients with myocardial infarction developed an elevation more than twice that of normal subjects and non-coronary patients. Since smoking and nicotine change the normal pattern of some aspects of lipid metabolism, the author concludes that these may have causative significance in atherosclerosis and thus in coronary artery disease.

Present knowledge about the genesis of coronary artery disease suggests that some combination of these factors or all of them collectively result in the disease; or perhaps that a totally unsuspected source exists and has not yet been identified. Current thinking seems to favour the first two alternatives.

Thoughtful perusal of the variables related to Coronary Heart Disease reveals that most of them with the exception of genetically transmitted hyperlipidemias, sex and age fall within the realm of possible control by an individual or groups of individuals and hence of prevention. Epidemiological data is now sufficiently precise to permit construction of a "coronary profile" from which can be derived some predictive value in terms of preventing first heart attacks and to some extent control of the disease and prevention of further infarction.

It is proposed here that the key variables in prevention are public knowledge and active awareness of the nature of coronary heart disease, its assumed causative factors and its management. Some research efforts are currently being directed at primary prevention. The U.S., for example, hosted

its first International Conference on Preventive Cardiology in 1964.[3] For the general public, educational programs are being offered through local Health Education Centers.[4]

Significant strides have been made in the medical management of acute coronary heart disease. Generally about 50-60% of patients with myocardial infarctions die before reaching the hospital, usually within the first hour after onset of symptoms. In the past about 30% of hospital-treated patients died within the first forty-eight hours or so after admission. However since the establishment of coronary care units this mortality rate has decreased to about 15% (Andreoli et al., 1968). For the most part this success is attributed to electrocardiographic monitoring techniques designed for instant detection of rhythm disturbances and by the availability of a skilled team to correct such arrythmias immediately and to initiate resuscitation. A further extension of such life saving methods has been made possible by the installation of monitoring equipment in ambulances (Woodwark and Gillespie, 1970).

Thus it is that a considerable number of persons are being rescued from possible demise to become implicated in the process of recovery about which very little is known, at least from a psychosociological point of view. Acute episodes of ischemia and especially myocardial infarction can be viewed as a phenomenon which disrupts the usual life pattern of an individual and precipitates a series of redefinitions of his self and his life situation.

This study focusses on psychosociological factors operative in the process of recovery from an acute episode of

coronary heart disease. Specifically it deals with the following questions, later to be incorporated into testable hypotheses:

1. How does the subject perceive and define his illness? Does he see it as inevitable, as predetermined by fate or some higher Power? Or does he see it as the end result of a life style which he has, consciously or unconsciously, chosen for himself?
2. How does the subject define his 'self' in relation to his illness? Does he passively accept the hand of fate or does he conceive of himself as an active agent in command of his own destiny?
3. What are the implications of definitions of his illness and his Self for recovery and eventual outcome?

By 'recovery' is meant (a) achievement of a return to the premorbid state particularly in the physical, psychological and social spheres; and/or (b) achievement of maximal functioning in the social and psychological spheres within the limits of physical capacity (Croog et al., 1968). Exploring the meaning of such a critical episode for the subject may yield valuable insights upon which to base the therapeutic relationship in the post-coronary period. This approach seems promising, since in the end the outcome of heart disease may depend to a large extent on the attitude and actions of the patient notwithstanding the expertise and dedication of cardiac specialists, associated professionals and paramedical personnel and the availability of the most advanced technological resources.

Current literature on heart disease reveals three distinct lines of inquiry. The first and most voluminous deals with the problem of the etiology and epidemiology of the disease; the second is concerned with the therapeutic management; and the third seeks to explicate the factors associated with the process of recovery from heart disease.

Numerous investigators from different disciplines have contributed sufficient empirical data so that at least the parameters of variables associated with etiology are beginning to emerge. Unfortunately the literature on therapy and rehabilitation does not yet reflect comparable development in regard to the recovery process. There are of course various clinical reports of specific modes of treatment which practitioners have tested and found effective. However much of the writing concerned with therapy and rehabilitation consists of impressionistic case materials, outlines of therapeutic programs, and arguments in favor of one or another therapeutic technique or philosophy of treatment. Thus far few investigators have carried out controlled studies testing the relationship of specific, well-defined variables to long-term outcome from heart disease (Croog, Levine and Lurie, 1968).

In the absence of specific studies concerned with the recovery process in heart disease from the perspective of the present study an attempt is made here to review selected materials in related areas. In order to provide an organized framework, the materials being reviewed are grouped into three sections corresponding to the three questions posed earlier, namely, the subject's perceptions of the illness, definitions of the Self in relation to the illness, and the implications of these perceptions and definitions for recovery.

Research and theorizing on factors associated with differential perceptions of illness have been concerned with problems other than the recovery process. Nevertheless this body of knowledge is useful for understanding the behavior of patients who are in the process of recovering from coronary heart disease. The ways in which the patient perceives his illness and his attitudes toward the physician and medical care may all help to determine the way he behaves during his illness, his mood level, his use of medical and community services, and his level of compliance with medical advice. For example, if the patient perceives his illness as probably fatal his chances of recovery may be substantially reduced. Thus far investigators have not made systematic attempts to control for a particular illness pattern and then examined the differential outcomes in recovery in the case of patient having differing conceptions of the disease.

Some suggestive evidence on the relationship between perceptions of the disease and the course of recovery may be found in reports on illnesses other than heart disease. For example, Mark Zborowski (1952) in a case study of a small population of patients in a New York Veterans' Hospital found substantial differences between men of various ethnic origins in attitudes toward their disease, expression of symptoms, and response to physicians. The importance of the role of cultural factors in responses to pain was indicated in this study but no attempts were made to relate these culturally determined differences to the outcome of their illness.

Along similar lines, Zola (1962) comparing patients with matching ailments seeking treatment in the outpatient clinic

of a large urban hospital found that those of Irish origins tended to deny their illnesses and offer minimal descriptive detail to their physicians, who in turn considered these patients "normal". Italian patients, on the other hand, tended to be viewed as "neurotic" because they described and complained about more symptoms, had more bodily areas affected, and experienced more malaise.

In both these studies differential perception of illness were found to be related to ethnic origins. It can only be inferred that physicians responded differently to those two groups of patients but whether treatment actually differed and whether the course of recovery was significantly affected by these differing responses is not known.

A study by Walter L. Johnson (1963) offers indirect evidence of another kind on relationships between recovery processes and social and cultural factors. As part of a larger study of family reactions to cardiac disease, Johnson studied a population of urban men who had suffered a first myocardial infarction. The information collected related to the degree to which they complied with medical advice in the therapeutic regimen. He reports that compliance was not markedly affected by sub-group norms insofar as they are directly measured by socio-cultural variables. Level of education seemed to be related to compliance with advice on use of tobacco, and religious affiliation was associated with conformity to advice on avoiding stress and strain. However in regard to all other areas of advice studied, i.e., sleep, rest, activity, medication, diet, job adjustment, alcohol and sexual relations, Johnson found that there was

no difference between patients of variable age, sex, religion, nativity, occupation, education, social class, or family size (Croog et al., 1968). If it is inferred that patients do vary in their perception of disease in line with any of these variables then it would appear that such variation is not significant in determining compliance. Once again the data are not directly concerned with the outcome of recovery unless this can be related to level of compliance.

This last study suggests that demographic variables may have limited value in explaining illness behaviour in societies characterized by a scientific health orientation.[5] If this is the case future researchers will need to focus on variables of a different nature to explain the observed variations in the outcome of similar illnesses.

Acute coronary heart disease represents a serious threat to the patient as a self-sufficient intact individual and the way he perceives his Self may have much to do with the course and outcome of his illness. Such perceptions cannot be ignored as they may spell the difference between success and failure of both therapeutic and rehabilitation programs. Few empirical studies have been directed to an examination of the relation between self-conception and response to illness. Though not concerned with heart disease, other studies of persons with visible physical injuries can yield valuable insights.

Fishman (1949) found that the self-concept constituted one of the factors which determined adjustment to leg prosthesis in forty-eight patients with above-the-knee amputations.

In another study of one hundred hospitalized service amputees and plastic surgery cases, White et al., (1948) noted

that the following self-feelings were associated with disability: (a) fear that it is not "me as a person but my injury" that is of primary importance to others; (b) fear that the injury devaluates him as a person; (c) guilt connected with the feeling of being a burden; (d) conflict between the desire for dependence and independence; (e) feelings of self-pity.

A further study of differential effects of dissimilar disabilities upon self-perception led Shelsky (1957) to conclude that: (a) an overt or visible injury does not necessarily have more of an effect upon the self-concept than a non-visible injury or illness; (b) amputees can more readily evaluate their abilities and disabilities than the tuberculous; (c) a physical loss seems to be incorporated into the self-concept more adequately and with less general damage than an all-pervasive illness such as tuberculosis.

The above studies serve to demonstrate the integral relationship between self-conception and physical injury and disease, and lead to further questions about the relationship between self-conception and the patient's response to rehabilitation programs. In a study of one hundred orthopedic patients, Theodore J. Litman (1962) proposed and found support for two basic hypotheses: (a) that there is a direct relationship between a person's conception of Self and his response to a program of physical rehabilitation; and (b) that if an individual has been able to accept his disability and its limitations realistically he will more likely maintain a favourable conception of Self.

In heart disease the realistic acceptance of the illness and the limitations it imposes is considered by clinicians

to be an important criterion of adjustment in the recovery period. Failure to do so is thought to be a major reason for one of the problematic outcomes termed cardiac neurosis, in which the patient becomes obsessed with his heart symptoms and thus becomes a self-fulfilled invalid. While no empirical study has concerned itself with this problem reference is made to a theory of neurosis proposed by Arnold Rose (1962). Neurosis is here defined as "the inability to act reasonably effectively within the material means and limitations present, for the achievement of socially acceptable and personally accepted goals, because of anxiety or because of compulsions which camouflage anxiety" (Rose, 1962: 539). The theory is based on the social psychology of C. H. Cooley and C. H. Mead who held that a "self" reflecting the reactions of others toward it is an important intervening variable in human conduct. Rose thus proposes the hypothesis that a "depreciated" self or "mutilated" self is a major factor in the development of a neurosis because an individual's ability to accept strongly held values of any kind and to act effectively to achieve those values is a function of his conception of himself - that he is an adequate, worthwhile, effective, and appreciated person.

Since an acute episode of coronary heart disease is generally experienced as a shattering event in which the individual's very existence is threatened it is assumed that variations in the self-concept will feature significantly in the process of recovery and final outcome of the illness. It may also help to explain such polar behavioural aberrations as cardiac neurosis and complete denial of limitations imposed by the illness.

Differential perceptions or definitions of illness in a folk-oriented population have been thought to be a function of cultural variations. However in a society characterized by a gradual blurring of cultural traits in respect to illness or illness behavior and a predominance of cosmopolitan orientation, it seems that a factor of key significance might be the extent of knowledge about and the degree of understanding an individual has about his illness, its etiology and management. The patient's compliance to his physician's advice and thus the long-term outcome of the illness may depend to a large extent on how well the rationale behind prescriptions are understood.

While the doctor-patient relationship may be an important feature in determining level of compliance, other variables also of a sociological and psychological nature are often hypothesized as related to the degree to which individuals follow medical instructions.

A study by Milton I. Davis (1962) offers indirect evidence of a relationship between coronary patients' cognitive knowledge and perception of their illness and subsequent compliance to a medical regimen. He found that his subjects chose among the various prescriptions (restrictions in diet, work, personal habits) which they accept and their choice is made to minimize the magnitude of cognitive dissonance. The decision is a function of several factors: (a) doctor-patient relationship; i.e., a formal or business-like relationship resulted in a greater degree of compliance; (b) values in conflict with those concerned with health resulted in dissonance and consequent noncompliance; (c) whether or not the family and fiends supported

the doctor's advice affected the cardiac patient's behavior. This study indicates a willingness to comply with prescriptions as long as these do not interfere with the subject's personal values.

Two major investigations also dealing in part with the problem of compliance are the Purdue Farm Cardiac Project (1958), and the study by Walter L. Johnson (1963) to which earlier reference was made. In both studies cardiac patients who experienced a first myocardial infarction were asked to report on the advice which they remembered receiving from their physicians. The accuracy of their reports was not validated through checking with the physicians themselves. The key variable in determining reported compliance was the nature of the advice itself. Thus the Purdue investigators found patients reporting high compliance with dietary recommendations and low compliance in regard to changes recommended in what the authors term "personal habits".

Johnson found high compliance in regard to use of medications but that subjects reported most difficulty in following instructions to avoid "Stress and Strain". Level of compliance in the Purdue Project was thought to be related to characteristics such as compulsiveness toward work and certain beliefs regarding the nature of heart disease and medical practice (Croog et al., 1968). Johnson only found a positive correlation between compliance regarding the avoidance of tobacco and educational level, and compliance in avoiding stress and strain and religious affiliation. A series of sociological variables - age, sex, nativity, occupation, social class and

household size - were not associated with differential levels of compliance.

These three studies, all exploratory in nature, offer useful clues for developing future research on the problem of compliance, specifically to determine more accurately the variables associated with compliance and the degree to which differential levels of such compliance are associated with a favorable course of recovery.

A further significant factor intervening between the doctor-patient relationship and level of compliance by the heart patient is the nature of communication - both its substantive content and adequacy. Little research has been done to analyze differential degree of communication or understanding between doctor and cardiac patient, and those elements associated with varying degrees of compliance. However research concerning communication problems in other illnesses reveal that in fact communication gaps exist and that they are mediated by various kinds of social and cultural factors.

Samora et al. (1961) in a study of patients in a general hospital asked these subjects the meaning of key medical terms commonly used in discussion between doctors and patients. They found that level of knowledge varied in terms of amount of education and membership in a particular ethnic group. Patients of Spanish-American origins had lower scores than Negroes or Anglo-American patients even when education was held constant. It was concluded that much of what was communicated by doctors to patients was not clearly understood by a considerable portion of patients.

Further evidence of a communication gap between doctors and patients was found in a study by Pratt, Seligman and Reader (1957). A population of patients was asked to complete a questionnaire indicating knowledge about the etiology and treatment of a series of common diseases. A group of doctors was then asked to indicate what they thought patients should know and what they believed patients actually did know. Although the indicated level of patient knowledge was comparatively low, the majority of doctors tended to underestimate the actual level of patient knowledge. The physicians indicated that they believed the patients should be expected to know more than they did. Thus it is seen that doctors and patients may respond to one another in terms of disparate perceptions (Croog et al., 1968).

One may then look to patterns of communication between physicians and their patients for possible clues in explaining differences in knowledge and understanding of illness as an important factor in both compliance and outcome.

In reviewing the pertinent literature, an attempt has been made to focus on a selection of variables felt to play a significant role in explaining different outcomes of coronary heart disease, namely, perceptions of illness and perceptions of the Self in relation to illness, both of which are considered in part a function of knowledge and beliefs acquired during communications with physicians and other treatment personnel.

CHAPTER II

THEORETICAL FRAMEWORK

The problem under study is prompted by the observation that given relatively similar diagnoses and comparable opportunities for expert medical and hospital care persons with acute episodes of coronary heart disease will progress to different kinds of prognoses and adjustment to that condition. Guidelines for successful rehabilitation are emerging with greater confidence and clarity yet the process of recovery from heart disease remains problematic. Hence a search is being made to identify some of the factors which aid or deter a positive prognosis.

An attempt to explain differing outcomes is made by reference to the concept of alienation as it relates to social learning. This theme has been developed by Melvin Seeman in a theoretical paper (1961) and a series of empirical studies (1962, 1963, 1967). When personal alienation is defined as perceived powerlessness to control one's fate in critical life situations it is presumed to act as a deterrent to relevant social learning and hence to active control of events. The question is raised whether differential feelings of powerlessness characterizing persons experiencing the crisis of acute coronary heart disease will act as a deterrent to their learning the information about their illness which would enable them to exercise more control of their health status in the future.

This study is designed to measure the effects of perceived powerlessness in relation to relevant social learning in two groups of coronary patients, one group being exposed to

variable but essentially incidental health teaching and the other to an experimental coronary health education program.

Alienation is an all-pervasive concept in both contemporary literature and in the history of sociological thought. It is a central theme in the classics of Marx and Durkheim and continues to predominate in a large number of contemporary works explicating the supposed consequences of alienation.

However as Seeman points out (Seeman, 1959), the concept has many dimensions. He identifies five: powerlessness, meaninglessness, normlessness, isolation and self-estrangement. In his first three alienation studies, Seeman chooses to utilize the powerlessness version. He claims that this is the notion of alienation as it originated in the Marxian view of the worker's condition in capitalist society, and used by contemporaries like C. Wright Mills. This variant of alienation can be conceived as "the expectancy or probability held by the individual that his own behavior cannot determine the occurrence of the outcomes of reinforcements he needs" (Seeman, 1959:784).

Seeman then specifies the limits of this conception. First, it is a distinctly social-psychological view. It does not treat powerlessness from the standpoint of the objective conditions in society; but this does not mean that these conditions need be ignored in research dealing with this variety of alienation. These objective conditions are relevant for example in determining the degree of realism involved in the individual's response to his situation.

Further, in this version of alienation the individual's expectancy for control of events is clearly distinguished from:

(a) the objective situation of powerlessness as seen by some observer;

(b) the observer's judgment of that situation against some ethical standard; and

(c) the individual's sense of a discrepancy between his expectations for control and his desire for control.

The use of powerlessness as an expectancy means, according to Seeman, that this version of alienation is very closely related to the notion developed by Rotter of "internal VERSUS external control of reinforcements". The latter construct refers to the individual's sense of personal control over the reinforcement situation as contrasted with his view that the occurrence of reinforcement is dependent upon external conditions such as chance, luck, or the manipulation of others. Seeman feels that the congruence in these formulations provides the link between learning theory and that of alienation.

Seeman felt initially that the applicability of this concept of alienation should be limited to the arena of man's relation to the larger social order. Nevertheless he accepted the possibility that such an operational concept of alienation would also be related to expectancies for control in more intimate areas such as health and rehabilitation. He has himself tested his theory in a series of studies dealing with the same theme in a variety of situations.

The first study, "Alienation and Learning in a Hospital Setting" (Seeman and Evans, 1962) tests the hypothesis that "differences in alienation (i.e. powerlessness) are associated with differential learning of behavior- relevant information".

Comparing patients who differed in their degree of alienation[6] but who were matched for socio-economic backgrounds and for health and hospital histories it was shown that the more alienated patients scored lower on an objective test of knowledge about tuberculosis. Thus it was clear that patients' perceived powerlessness was a factor affecting their response to critical circumstances in their health career, i.e. acquisition of knowledge and subsequent behavior. Furthermore these differences were reflected in both the staff's description of the patients and in the patients' attitudes about the information process. The authors concluded that the patient's general sense of powerlessness or personal control influences his learning about tuberculosis with high alienation being conducive to poor learning.

Although the differences in knowledge on the objective test were statistically significant the writers raised the possibility that these may in fact be a function of hidden differences in feelings of powerlessness. The study also provoked an important question about the causal chain of events, i.e. was the poor learning produced by powerlessness OR did the powerlessness result from inadequate knowledge? Furthermore the study made no distinction among kinds of knowledge; hence one is left wondering how generalized the learning tie with powerlessness may be and , indeed, whether the poor health knowledge shown by the alienated patients would be parallelled in almost any domain. The results could suggest a number of conclusions, i.e. a highly generalized withdrawal of interest on their part or fundamental differences in I.Q. or capacity to learn.

An attempt was made to clarify some of these questions in a further test of the alienation-social learning theory using a Reformatory setting (Seeman, 1963). The following hypothesis was proposed: "Since the alienated inmates hold low expectancies for control they will learn less and presumably exhibit less interest in information that is objectively quite relevant to their careers, but implies planning or faking active steps to control future contingencies." Three kinds of information differing chiefly in their usefulness for managing their own destiny were presented to the prisoners. Specifically the information related to (1) the immediate reformatory situation; (2) achieving successful parole; (3) long-range prospects for a non-criminal career. It was predicted that inmates scoring low in powerlessness would show superior retention of the parole material since this material most clearly implies the possibility of personal control over events.[7] The findings confirmed the prediction. According to Seeman examination of the social background of the inmates shows that these results cannot be attributed to differences in intelligence or criminal history. Further, the superior learning of the unalienated prisoners is shown to be associated with achievement-oriented behavior within the prison and in their outside situations.

There now remains the problem of exploring the degree of generality or the limitations that hold for the thesis proposed by Seeman that an individual's generalized expectancy for control of his outcomes (i.e., sense of powerlessness) governs his attention to and acquisition of information available in the environment. Support for the thesis is found also in mass society theories, in the argument that structural

conditions of mass society (increasing mobility, rationalization of industrial processes, bureaucratization) encourage a sense of powerlessness which leads the individual to be insensitive to and uninformed about an environment over which he believes he has little influence. The findings of the alienation studies tend to provide confirmation of the thesis in various control-relevant situations and also to limits of the association between powerlessness and poor learning; for neither learning theory nor mass society theory necessarily imply that the powerless will be less knowledgeable in all domains. The principle at stake, according to Seeman, is not so much that personality or response patterns of an overall character emerge; it is rather that in some range of specifiable circumstances motivated avoidance of learning occurs. The repeated demonstration that the poor learning which powerlessness encourages is specific to control-relevant information would establish a theoretically-derived principle that is broadly applicable yet is capable of generating discriminating predictions (Seeman, 1967).

Thus for purposes of re-confirmation of his thesis and added depth of demonstration Seeman conducted a third study using Swedish data obtained from students at Lund University (Seeman, 1967). Two major hypotheses were tested: (a) that those who are high in powerlessness will have inferior knowledge in control-relevant areas of their experience; and (b) that the sense of powerlessness leads to behavioral avoidance when the individual's anxieties about control are invoked. Subjects were rated on their performance in two knowledge tests, one on cultural

affairs, and one on nuclear affairs. Results of the study reveal that high powerlessness goes with poor nuclear knowledge while alienated and unalienated students do not differ in cultural information.

The focus upon differential learning serves to clarify the kind of construct and the kind of theoretical derivations involved in the typical psychological and sociological assertions about a person's sense of efficacy, competence or mastery. Seeman feels that the data obtained in this last study reinforce the observation that when we speak of powerlessness and mastery we are dealing with expectancies for control which govern the individual's learning in determinate yet discriminating ways. People who believe that the environment is one they can have an effect upon show that they are sensitive to potentially helpful clues about that environment whether those clues concern matters of health, parole or politics; and conversely, knowledge acquisition is irrelevant for those who believe that fate, luck, chance or external forces control the outcome of events.

The proposed theory of alienation in relation to social learning in control-relevant life situations as developed by Melvin Seeman would seem to have special applicability in the case of coronary patients whose recovery and continued well-being may depend to such a large extent on their understanding of their illness and the rationale for the caref ully specified health regimen. For those who believe that the illness and its outcome is predetermined by heredity, fate, or some higher power (i.e., those high in alienation, and powerless to control their fate) there is

obviously little need for learning the possible causes of the illness and the means of controlling the consequences. It is anticipated that motivation for compliance to medical prescriptions would be less strong since the outcome, favourable or unfavourable, is already decided. One might also speculate that two of the extreme patterns of behavioral response encountered among coronary patients, i.e. crippling obsession with heart symptoms or total denial of physical limitations, is related to the degree of personal alienation. In each case the long term outcome of the illness would be affected by such behavioural responses. It can be assumed that an unduly high degree of fear and anxiety would underlie both the cardiac neurosis in which an individual becomes an invalid whose life is dominated by the expectancy of a recurrent and possibly fatal myocardial infarction, and likewise the quiet despair of him who has effectively denied his limitations in an effort to experience life in the utmost before the final blow strikes. Fortunately such extreme reactions are the exceptions rather than the rule but in relative degrees they are more frequently encountered and thus may act as a deterrent to successful rehabilitation.

On the contrary it is expected that persons low in alienation who feel, within limits, to be in control of their own destiny would be more likely to recognize that their illness is in part the result of personal habits, attitudes, or life style of their own making and hence would accept greater responsibility for controlling these things. If Seeman's thesis is valid, one would hypothesize that such persons would seek and utilize information about their illness, its

etiology and management as would enable them to assume rational control. Compliance to medical prescriptions would be higher and consequently it could be expected that more favourable outcomes would ensue. However, the heart patient is by definition somewhat limited in that his knowledge of pathophysiology may be minimal and the heart injury is not visible even on x-ray films. Hence he must to a large extent depend upon information communicated to him by physicians and other treatment personnel.

In the medical literature on the rehabilitation of the cardiac patient a factor frequently cited as an important element is explanation by the physician to patient and family about the nature of the disease and the projected treatment. Communication between doctor and patient on these issues serves to reduce fear and misinformation, reduces cardiac disability, and encourages the patient to follow the regimen prescribed by the physician (Croog et al., 1968). This viewpoint regarding the importance of adequate explanation appears in a large number of articles by physicians reviewing programs of treatment. Williams et al. conducted a limited survey in which cardiologists and general practitioners were asked for their views concerning how rehabilitation of cardiac patients might be most effectively accomplished. Listed most frequently was "education of patient and family by the physician" as a means of dealing with "the major problems faced by the physician in his efforts to rehabilitate individuals with heart disease" (Croog et al., 1968:132).

In view of the widespread assumptions regarding the importance of adequate education of patient by physician, it is interesting to note that not one single example in the

literature can be found in which this thesis has been tested. Research in which use is made of both experimental and control groups in regard to the differential effects of physician approaches to explanation are difficult to find. Thus one hesitates to state with confidence that particular types of patterns of communication or that specific content in communication is more clearly linked to favourable outcome.

Elements influencing the nature of communication between doctor and patient are varied and complex. For example, by the way in which the role relations between doctor and patient are structured, by the background and orientation of the physician, by the locus in which the communication takes place as well as the circumstances, by the personality of the doctor, and probably by other factors as well.

Variable physician approaches to explanation may be examined in the light of theoretical models of patient-physician relationships. Szasz and Hollender (Croog et al., 1968:133) for example described three types: first, the activity-passivity model in which the physician is the active agent while the patient is passive. This model is appropriate for acutely ill persons where the physician is in a position of authority and control. A second type is the Guidance-Cooperation Model in which the patient is capable of following directions and is guided by the physician in a therapeutic regimen. The third is the Mutual Participation Model, also termed the Educational Model, in which the physician, by means of education, helps the patient to help himself.

Each model is most appropriate to a particular phase of recovery and all three models are likely utilized in variable

degrees by most physicians. However if any one model becomes the preferred method characterizing physician-patient relationships then one might expect differences in outcome. For example in a 'pure' case where models One and Two predominate a person with heart disease will receive a set of directions with varying amounts of explanation and exhortation. Whereas if the Mutual-Participation or Educational model are the preferred mode of doctor-patient relationship one would expect to see a systematic education of the patient in all aspects of his illness and its management.

Two major determinants of recovery from heart disease - personal alienation and inadequate information about the illness - are being postulated as deterrents to successful rehabilitation of cardiac patients.

CHAPTER III

RESEARCH DESIGN

The objective in the present study is to observe the effects of alienation on relevant social learning among patients with acute coronary heart disease. Further we wish to see whether increased knowledge will result in greater compliance to a medical regimen and hence in more favourable outcomes in terms of rehabilitation. Using a modified control-experimental design the research involves two groups of cardiac patients who were exposed to different experiences. The comparison group received variable but essentially incidental instruction about their illness and its management while the treatment group were exposed to an experimental program of coronary health education. Participating in the project were the chief cardiologist of the service, a professional dietitian, several physiotherapists and the writer who performed the dual role of nursing instructor and researcher.

THE STUDY POPULATION

Comparison subjects were all those persons meeting the criteria who were admitted to the coronary care unit of two local general hospitals between April and October, 1970. Treatment subjects were all those meeting the criteria who were admitted to only one of the hospitals between December, 1970 and April, 1971. Criteria for selection in both groups were:

(1) discharge diagnosis of acute myocardial ischemia and/or myocardial infarction;

(2) male;

(3) age 65 years and under.

Including patients with both diagnoses was considered useful since the underlying disease process is similar except in degree of cardiac impairment. Patients in both categories require similar treatment and would equally profit from systematic coronary health education. Lastly it was necessary in order to increase the size of the study population. The decision to exclude persons over 65 years was based on several considerations. These people are more likely to be retired from their usual occupation and hence face different kinds of problems; their life style and personal habits are more firmly established making compliance to a medical regimen more difficult; and finally the process of aging is superimposed on other factors thought to be associated with coronary heart disease. Females were excluded from the study because they are less likely to be affected with the disease under the age of 65 and if so, they are faced with different problems of adjustment in the recovery period.

Once the coronary health education program was introduced, it was to be made available to all patients, hence it was necessary that the comparison group be made up of patients hospitalized during a five-month period prior to the initiation of the program. These subjects were presumably given individual instructions by their physicians according to the preferred orientation of those practitioners and subject to the usual limitations of time and locus of communication.

The treatment group consisted of patients hospitalized during a three-month period following the inception of a planned program of health instruction and prescription for rehabilitation.

Subjects were asked to listen to a series of taped instructions and/or do selected illustrated readings. Prescriptions for rehabilitation, especially in the areas of dietary and activity control, were minutely and precisely defined. Where applicable each patient was given printed outlines of the above measures and encouraged to contact members of the project team for follow-up consultation if questions arose in the post-discharge period. Ample time and opportunity were provided for discussion so that both the staff and patients were satisfied that the message was fully comprehensible.

Briefly, the content of the instructions related to:

(a) explanation of the coronary heart attack --
anatomy of coronary arteries; atheroma and factors associated with its production; coronary thrombosis and its effect on the myocardium; healing processes; benefits of rest followed by convalescent exercise.

(b) convalescent activity regime (after leaving hospital) --
objectives; types of exercise; activity levels; warning symptoms; cardiac pain and its control.

(c) post-convalescent activity regime --
objectives; types of activity; activity levels; activity response checks, Y.M.C.A. reconditioning programs.

(d) tobacco addiction--
rationale for avoidance of tobacco; suppressal of withdrawal symptoms; methods of overcoming and controlling addiction.

(e) weight reduction and maintenance --
principles and methods; rationale; practical instructions for preparation of food.

(f) dietary regime --
rationale for prescription; fat-controlled diets; carbohydrate-controlled diets; practical instructions regarding buying and preparing foods.

(g) learning to live with coronary heart disease --
reducing predisposing factors associated with heart disease; review of prescriptions and rationale; modification of life style to reduce stress and strain and to incorporate health recommendations.

Each patient in the treatment group was also given individual direction by his own physician. In view of the small size of the study population and the real life situation, it is anticipated that differences in the treatment given would be less marked than in a laboratory situation where a relative absence of the experimental effect could be assured and more controls on patient characteristics achieved.

COLLECTION OF DATA

Data for the study were obtained through personal interviews using a structured questionnaire (see Appendix I). In order to find and interview patients for the comparison group, visits were made to the hospitals and written and telephone communications were used to contact physicians, patients, and their families. A period of two to four weeks had elapsed between discharge from the hospital and initial contact.

From those selected as possible subjects, five were excluded by their physicians. In three cases, the reason for

exclusion was fear of untoward reactions from patients who were thought to be "unstable", "neurotic", or "overly anxious". Of the remaining two cases, one appeared to be related to untoward physician reaction, while in the other instance no reason was offered. Four patients were hesitant about participating and were considered as refusals. Five persons were eliminated on the basis of distance, while five could not be contacted. One patient suffered another acute episode and was readmitted to hospital, while one patient died en route to the emergency department. Nineteen male subjects were finally obtained for the study. All interviews were conducted by the writer at the patient's home on an appointment basis.

Treatment subjects, nineteen in number to match the comparison group size, were located by the researcher shortly after their transfer from the intensive coronary care unit to a sub-acute ward or were directly referred by physicians. Of those selected for participation in the study three were excluded by their physician because of complicating medical problems, and one patient refused to participate. The initial interview occurred, on the average, approximately twelve to fourteen days following admission to hospital. At this time the questions for measuring alienation were asked and the patient's demographic characteristics were obtained. A further interview was done following completion of the teaching program usually the day prior to discharge. Treatment subjects were contacted by telephone for the final interview, approximately three weeks following discharge, with the exception

of the last five subjects whose follow-up interview occurred within one week of discharge due to limitations of time.

From the above discussion it is apparent that a fairly high degree of self-selection was operating in the comparison group. The higher number of physician and patient refusals to participate in the study may suggest that more patients high in alienation, by our definition, were systematically excluded. Also the time factor is important in the sense that these subjects had a longer period of recovery and hence motivation for participation was less urgent since no direct advantage would be gained by their participation. It was felt that several subjects had received personal encouragement from their own physician to be interviewed while in some cases of refusal the lack of personal acquaintance with the researcher, viewed as a stranger, may have been partially responsible for their lack of interest.

In addition, the longer lapse of time between discharge and interview in the comparison group may have worked to their disadvantage in terms of the scores they obtained on knowledge and compliance indices. A number of details may have been forgotten during this time lapse and their level of compliance may have gradually decreased in proportion to level of recovery. It could be anticipated that their level of post-coronary disability would be lower than those in the treatment group since these latter subjects were interviewed sooner after discharge. The factors of distance and unavailability may indicate that in fact those subjects who were most readily available were those whose degree of cardiac impairment was highest.

In the treatment group, the patients approached were still in hospital and presumably their motivation for learning and for aids to recovery would be at its highest level. This group had more to gain from their participation in the program and furthermore were personally contacted in face-to-face interactions by the project team, who were more likely to be perceived and accepted on the basis of their therapeutic role. Most of the subjects strongly supported the research goals and were keenly interested in participating and supplying desired information to complete questionnaires.

These subjects had the decided advantage of being tested while the information was still fresh in their minds having had numerous opportunities for reinforcement of learning, clarification of questions, support from the staff and a close bond of identification, all of which would be expected to be reflected in higher knowledge scores and in higher compliance scores. The degree of cardiac impairment was more difficult to assess since most patients were interviewed for the last time while still convalescing. The effect of returning to their former occupation could not therefore be taken into account. The above differences in approaching subjects, procedures used and time of interview relative to hospital discharge suggest limitations which will likely be reflected in the data.

Following is a presentation of hypotheses to be tested and a discussion of major variables:

Hypothesis One

Subjects higher in alienation will show less knowledge about their illness and its management than those lower in alienation.

Hypothesis Two

Subjects having greater knowledge about their illness and its management will show higher compliance to the prescribed health regimen than those having less knowledge.

Hypothesis Three

Subjects who show higher levels of compliance to the prescribed health regimen will show less post-coronary disability than those showing lower compliance.

Indices of Alienation

For purposes of this study alienation, the independent variable, was defined as "perceived powerlessness to control events in the critical situation of an acute cardiac illness". It was measured by seven forced-choice items (See Appendix I, Items 5, 18, 19, 20, 29, 30, 51).[8] An example of items used is the following: "Do you believe that becoming a success is primarily a matter of luck or strictly hard work?" (Item 5) "Hard work" was considered an index of low alienation and assigned a score of 0, while belief in luck was considered an expression of high alienation and was assigned a score of 1. All alienation items were scored in similar fashion.

As an extension of the above theme two items relating specifically to health were included, the first dealing with "health in general" and the second being directed to the present illness (see Appendix I, Items 16, 50). The questions

were included in an attempt to see whether feelings of alienation were generalized to health matters and to what extent these feelings would be modified after exposure to the instruction program. The comparison group answered the first question at the beginning of the interview and the second question toward the end of the interview, while the treatment group answered the first question in the initial interview and the second question following completion of the treatment program.

The questions and answers are presented for comparison:

Question 16: "How much control do you think people have over their own health?"

Responses were scored as follows: great deal of control (indicating low alienation) was assigned 1 point; 2 points were given for "some control"; and 3 points were assigned to the "no control" responses. The same scoring method was used in:

Question 50: "How much do you think you can control what happens to your own health from now on?"

The comparison group obtained a mean score of 1.73 on question 16, and 1.79 on question 50, while the treatment group's mean score was 1.11 for question 16 and 1.06 for question 50. These responses correspond with the generally higher alienation scores of the comparison group, a slight increase being observed for the question dealing with their own illness while the contrary is true of the treatment group who showed a slight decrease in alienation in relation to their current illness following systematic instruction.

Three categories of dependent variables were measured:

(a) knowledge regarding the nature of coronary heart disease, the factors associated with it, and the rationale for specific prescriptions;

(b) level of compliance to prescribed regimen relating to rest and activity, smoking, diet, medications and stress;

(c) level of post-coronary disability.

Indices of Knowledge

Knowledge items were derived from many sources and included information considered desirable for an adequate understanding of the illness and its management. (See Appendix II.) They also included clearly defined prescriptions for all aspects of health management and printed directions where applicable. The total maximal knowledge score was 66.

Both groups were subjected to the same test and in both groups lack of clearly defined prescriptions resulted in lower scores. This occurred particularly in the case of prescription for control of activity. An example of a low-scoring prescription would be "Take it easy for a few weeks", while a high-scoring prescription specified the graduated levels of activity. The latter program was not uniformly accepted by all physicians for treatment subjects even though the latter received general instructions about activity and exercise. These treatment subjects received lower knowledge scores than those who participated in the prescribed activity program.

Knowledge of pathology and etiology of coronary heart disease was assessed by means of indirect questions and probing. For example:

"People say that if you've had one heart attack you're bound to have another. Do you think this is true?" (Appendix I, Item 15)

Probing was required in order to assess the basis for a positive or negative answer, i.e. whether the respondent's opinion was based on factual information or a hunch or hearsay. Knowledge of the rationale for the prescribed health regimen was measured by direct questions about individual prescriptions where applicable, otherwise by indirect questions and probing.

Indices of Compliance to Health Regimen

Compliance scores were based on the knowledge items on the assumption that where prescriptions were clearly defined compliance could be assessed more accurately. One would then expect a proportionate correspondence between knowledge and compliance scores. Since in the comparison group some prescriptions were less clearly specified, there may have been high compliance as defined by the patient and based on his perception of the prescription. However, in the study, compliance based upon vague prescriptions was assigned a lower score than compliance based on specific prescriptions. It would be expected therefore that compliance scores for the comparison group would be considerably lower than those of the treatment group.

All compliance items (Appendix II) were scored as follows: never or seldom = 0; some time = 1; complied most of the time = 2; complied all the time = 3. Responses were in some cases substantiated by the spouse though the subject's reported compliance was accepted at face value. No attempt

was made to verify the nature of specific prescriptions with attending physicians since it is felt that the patient's behaviour is a response to his perceptions rather than what may have actually been recommended by the doctor.

Indices of Post-coronary Disability

The outcome of the illness was measured by an assessment of impairment in the fulfilment of usual family, occupational, recreational and social roles. A second measure of disability was obtained by expressions of self-feelings (physical and psychological) after the illness as compared to the period preceding the acute episode. (See Appendix II)

Arbitrary judgments were made and scores were assigned as follows: no change or improvement in post-coronary disability = 0; slight impairment = 1; moderate impairment = 2, severe impairment - 3; very severe impairment = 4.

It would seem reasonable that varying degrees of residual heart damage would likely be reflected in the post-coronary outcome and hence one might expect difficulty in separating the effects of alienation, knowledge and compliance from those of pathology.

It was not possible to control for extent of pathology due to the limited size of the study population; however, a record was kept of final diagnosis, previous myocardial infarctions, and complications arising from the current illness. Group comparisons on these variables will be presented later.

A further limitation of the study is that it is concerned only with short-term outcomes. It is recognized that in the long run various other factors may operate to alter the

relationship among the variables being tested here. The time factor, for example, is significant in that subjects in the comparison group will have had a longer period of recovery and survival than those in the treatment group at the time of interviewing and completion of the study.

Control variables included in the questionaire consist of demographic, epidemiological and medically significant data. Variables considered relevant to the present study are presented below.

Characteristics of the Study Population

Demographic and Social Variables

Age, educational level, and occupational level are thought to be of special importance in relation to the present study as differences are more likely to be reflected in the data on alienation, knowledge, compliance, and post-coronary disability.

Characteristics of the two groups are presented below for comparison.

TABLE 1

Demographic and Social Characteristics
of Comparison and Treatment Groups

Age	C	T	Education	C	T	Occupation	C	T
35-39	1	1	0-8 years	4	9	unskilled	2	2
40-49	4	3	9-11 years	6	3	semi-skilled	2	5
50-59	6	10	12 years	4	3	skilled and foremen	5	4
60-66	8	5	over 12 years	5	4	clerks and kindred proprietors and managers	4	2
						professionals	1	3

Legend: C - Comparison Group N = 19

T - Treatment Group N = 19

Members of the comparison group were slightly older than those of the treatment group, the majority of whom were in the 50-59 age group. This slight increase in age may be reflected in higher post-coronary disability scores since several of these comparison subjects would be close to retirement. Thus impairment in their occupational role especially, may be higher. The younger average age of the treatment group may be reflected in more extensive pathology being at this time presumably at the peak of their career and under more stress.

There were more treatment subjects who had not achieved a high school level of education. On the whole, comparison subjects had a slightly higher educational attainment which is reflected also in their proportionately higher levels of occupation except in the professional category. The above

differences would be expected to influence knowledge scores to some extent although the program was modified to suit the level of educational achievement by treatment subjects.

Epidemiological Variables

It is expected that differences in the type and degree of factors thought to be associated with coronary heart disease would influence to a large extent the variable pathology occurring in the groups, the nature of prescribed medical regimens and hence of compliance problems and the prospects for rehabilitation. The following table presents the epidemiological characteristics of both groups.

TABLE 2

Epidemiological Characteristics
of Comparison and Treatment Groups

Risk Factors Commonly Associated with C.H.D.	C	T
Heredity	8	12
Hypertension	3	6
Diabetes	3	1
Lack of Regular physical exercise	13	12
Sudden excessive physical exertion	6	7
Cigarette smoking - less than 1 pack per day	2	8
- more than 1 pack per day	16	9
Excessive ingestion of high fat and CHO foods	19	13
Overweight	19	13
Continued high stress level	17	17

Legend: C - Comparison Group
T - Treatment group
C.H.D. - Coronary Heart Disease
CHO - Carbohydrate

The presence of coronary heart disease in the patient's immediate family is thought to increase his chances of having it also, either through genetic or cultural transmission. Subjects were directly questioned on this and the heredity factor appears more frequently 12:8 in the treatment group.

Hypertension (high blood pressure) and diabetes are frequently associated with coronary heart disease. Confirmation of the above conditions came from the patient's record. The treatment group shows a higher 6:3 incidence of hypertension, while diabetes was more frequently found 3:1 in the comparison group.

The relationship between sedentary living and the high incidence of coronary heart disease in western countries has been repeatedly observed. Study subjects showed a high proportion of general physical inactivity, while sudden excessive exertion was mentioned about as frequently by each group as a possible precipitating factor in the current acute episode.

Excessive and prolonged cigarette smoking has been felt to increase the probability of coronary heart disease occurring by 20 to 50 percent. The comparison group smoked excessively 16:9 as compared to the treatment group who seemed to limit themselves 8:2 to less than 20 cigarettes per day.

A high intake of foods rich in fat (especially animal fat) and carbohydrate reflected in increased blood levels, confirmed by laboratory tests and nutritional history, was found to be a factor in the 19 comparison subjects, and 13 of the treatment subjects.

Overweight, defined as an excess of 10 pounds above the desirable weight for height and body frame occurred in direct proportion to food habits.[9] In this respect the comparison group tended to eat richer foods and suffer more from obesity than did treatment subjects. High cholesterol and triglyceride blood levels are felt to contribute directly to the underlying disease process of atherosclerosis (deposits of fatty plaques on the inner lining of the arteries) while excessive weight causes excessive heart strain.

The function of stress in relation to heart disease has been suspected for a long time, though physiologically it is more difficult to identify precisely (see pp. 5-6) for a discussion of psychological variables).

Responses concerning levels of stress as possibly associated with the present illness were drawn from Item 4 b, occupational stress (see Appendix I); item 14, dealing with etiology; item 23, concerning economical situation; and item 47, which indirectly measured family responsibility. From these responses it seems that 17:19 in both groups experienced fairly high levels of stress.

Differential distribution of multiple epidemiological factors occurring simultaneously is observed in the two groups. Among comparison subjects, two show the presence of four factors, fourteen show the presence of five and six factors, while seven factors are present in three of the subjects. In the treatment group, five subjects show the presence of four or less factors, five and six factors are present in nine of the subjects, and seven factors are observed in five subjects.

Thus it appears that a fairly high incidence of factors thought to be associated with coronary heart disease is observed in both study groups. (See Table 2)

TABLE 3

Pathology in
Comparison and Treatment Groups

	Final Diagnosis	C	T
A.	Acute Myocardial Infarction	8	10
	(Acute Myocardial Infarction with Complications)	(5)	(5)
	Moderate Myocardial Infarction	0	4
	Acute Ischemia - pending M.I.	11	5
B.	Previous Myocardial Infarction	7	7

Table 3 shows that an equal number in both groups, 7:7, have suffered one or more previous heart attacks. When one compares this data with risk factors described earlier, the question is raised whether some of these recurrent attacks might have been prevented by intensive instruction and higher levels of compliance by the patient. Several of the subjects expressed regret that the present information was either not made available or not stressed sufficiently to convince them of the need for modification of life style.

The same applies to the 16 patients whose underlying disease process (atherosclerosis) has been progressing to the extent that they have suffered acute ischemia (inadequate blood

supply to the heart muscle) which may possibly result in an infarct in the near future. Data reveals that more patients in the treatment group have suffered acute or moderate myocardial infarctions (damaged area of heart muscle due to blockage of blood supply) 14:8, though complications have developed in an equal number of comparison and treatment subjects.

CHAPTER IV

FINDINGS AND DISCUSSIONS

A comparison of alienation scores in the two groups will be first introduced to provide continuity with an earlier description of the Characteristics of the two groups. Then data pertaining to each of the hypotheses will be analyzed and discussed, followed by a brief concluding statement on the findings.

TABLE 4

Between-group Comparisons on Alienation

	High	Low
Comparison Group	13	6
Treatment Group	6	13

$N = 38$
$X^2 = 5.15$
$p > .05$

Scores were dichotomized at the median and analyzed using the Chi Square Test. Skewed scores in both groups, observed in Table 4, may be related to differences in demographic and social characteristics. It will be recalled that the comparison group were somewhat older on the average, a factor which may account for their feeling more powerless to control their fate. Some degree of selection may have operated among treatment subjects whose physician referred them because of their assumed amenability to learning about their illness. Another possible explanation is the limited alienation scale used in the study. A more refined measure might have resulted in a different pattern of distribution.

The purpose of the study was to compare two groups of patients, having differing experiences, in terms of the hypothesized relationship between lower alienation and higher knowledge, between higher knowledge and higher compliance, and between higher compliance and lower post-coronary disability. Having indicated statistically significant differences (>.05) in alienation among comparison and treatment subjects, the question is raised whether these differences are sufficiently great to account for differences in knowledge, compliance and post-coronary disability? Or, given these differences in alienation is it likely that even treatment subjects high in alienation will benefit from the experimental program?

The hypotheses are based on the assumption that the deterministic outlook of the more highly alienated persons may lead them to disregard the value of factual information and to minimize the importance of compliance to prescriptions since their power to influence outcomes may be perceived as limited. Persons lower in alienation may tend to seek more factual information and be more likely to comply to a medical regimen and thus to experience less post-coronary role disability. It is further assumed that such efforts may be frustrated by the perceived or real inaccessibility to the required information. Hence the introduction of a systematic program of coronary health education will presumably reinforce the existing tendency of those lower in alienation to seek and act upon such learnings. Thus treatment subjects low in alienation would be expected to show the greatest knowledge and compliance and the best outcomes. (For discussion of the possible effects of the program on those subjects higher in alienation see Note 10).

The level of measurement obtained on each variable is ordinal, and since each group contained only nineteen men, the non-parametric Kendall Rank Correlation Coefficient (r) was chosen to measure the relationship between variables. (The tables below present the mean correlation coefficient for each of the two groups.) The probability (P) associated with the occurrence of a correlation as large as the one observed in each of the two groups under the null hypothesis that the variables are unrelated was also computed and is presented for each of the coefficient (Siegel, 1956:195).

Hypothesis One

Subjects higher in alienation will show less knowledge about their illness and its management than those lower in alienation.

TABLE 5

Mean Rank Correlation between Alienation and Knowledge for each of the Two Study Groups

Comparison Group		Treatment Group	
tau	p	tau	p
-0.23	.076	-0.06	.367

While the results in Table 5 show for both groups a negative relationship between alienation and knowledge, it is the comparison group which shows the stronger negative correlation. That is, among comparison subjects those higher in alination tend to be lower in knowledge. This is slight evidence in support of the hypothesis. However for the treatment group it might be suggested that an intervening variable, i.e. the instruction program may be operating to minimize the expected

correlation between these two variables. In other words, alienation may be less important than systematic instruction as a determinant of knowledge regarding illness and its management.

Hypothesis Two

Subjects having greater knowledge about their illness and its management will show higher compliance to the prescribed health regimen than those having less knowledge.

TABLE 6

Mean Rank Correlation between Knowledge and Compliance for each of the Two Study Groups

Comparison Group		Treatment Group	
tau	p	tau	p
0.44	.004	0.14	.186

Though both groups show a positive relationship between knowledge and compliance, it is only in the comparison group that the correlation is strong enough to suggest support for the hypothesis. In the treatment subjects this relationship does not apparently obtain to any great extent which is contrary to expectations. There is no apparent explanation for this finding.

Hypothesis Three

Subjects showing higher compliance to the prescribed health regimen will experience less post-coronary disability than those showing lower compliance.

TABLE 7

Mean Rank Correlation between Compliance and Post-coronary Disability for each of the Two Study Groups

Comparison Group		Treatment Group	
tau	p	tau	p
0.01	.468	-0.16	.174

While there is really no relationship between compliance and post-coronary disability among comparison subjects, there is a slight negative correlation between the two variables among treatment subjects. Such a weak relationship does not permit us to conclude that the hypothesis is supported by the data.

Within-group comparisons reveal only weak support for the assumed negative relationship between alienation and knowledge, the positive relationship between knowledge and compliance, and the negative relationship between compliance and post-coronary disability. This might be interpreted to mean that the influence of the experimental program is more important in effecting differences in knowledge, compliance and post-coronary disability between the two groups. As an extension of the three hypotheses presented above, a fourth hypothesis will now be formulated and tested.

Hypothesis Four

Regardless of alienation, subjects exposed to systematic coronary health instruction (i.e. the treatment group) will show greater knowledge, higher compliance and less post-coronary disability than subjects not so exposed (i.e. the comparison group).

Scores are dichotomized at the median and between-group differences analyzed using the Chi Square Test.

TABLE 8

Between-group Comparisons on Knowledge

	High	Low
Comparison Group	-	19
Treatment Group	19	-

$N = 38$
$X^2 = 38$
$p > .05$

Here one is confronted with results that obviously reflect circumstances, indices and procedures used, and the role of the project team. Among circumstances, time is probably the main factor in that a longer period had elapsed between discharge from hospital and interview of comparison subjects than was the case for treatment subjects who were interviewed initially while still in hospital. Some attempt was made to compensate for the memory lapse among comparison subjects by more intensive probing for knowledge. Difficulties expressed by these subjects related to their failure to understand some of the medical terminology used by their physician, or where anatomical models had been used to illustrate pathology, some patients could not recall details. In other instances the problem appeared to be related to lack of clearly defined instructions, especially in regard to activity and dietary prescriptions. This latter factor, in some cases, accounted for lower scores in knowledge even though patients had been

carefully instructed and appeared to understand their health problem and the rationale for control measures.

Indices of knowledge were derived from many sources and included information considered important for a satisfactory understanding of coronary heart disease and its management. In most cases scores for the treatment subjects were positively boosted by the carefully defined graduated program of activity developed by the chief cardiologist in the service. Physiotherapists assisted each patient to interpret and implement the various prescriptions. Printed directions for continuing the program during the normal period of home convalescence were given to each subject. Another significant factor was the involvement of a professional dietitian who worked intensively with the patient and his family in teaching and prescribing dietary and weight control measures using printed materials where applicable. The remaining teaching and counselling was done by the researcher who performed the role of nursing instructor.

The above factors may account, at least in part, for the noticeably higher scores of treatment subjects. Information considered necessary for their management of post-hospital convalescence could be reinforced repeatedly. Ideally, the role of instructor and researcher would be separate and a proportionate amount of time allowed between discharge from hospital and final interview for both groups. In spite of these methodological limitations, it is anticipated that where instruction is comprehensive and prescriptions clearly defined the impact would be considerable in terms of outcomes.

TABLE 9

Between-group Comparisons on Compliance

	High	Low
Comparison Group	3	16
Treatment Group	16	3

$N = 38$
$X^2 = 17.78$
$p > .05$

Results in Table 8 and Table 9 show a fairly high degree of correspondence between knowledge and compliance scores especially in the treatment group. This is probably due to compliance being assessed on the basis of specifically defined prescriptions. For example if post-discharge activity was prescribed only in general terms, arbitrary judgments were made and scores tended to be lower than when activity was specified. Where prescriptions were specific, i.e. for drugs, compliance appeared high in both groups. This seemed to apply, in some cases in relation to smoking, where compliance was high only if the physician issued a definite order.

Compliance to recommendations for controlling stress was problematic. Considerable time was spent with treatment subjects in assisting them to identify the sources of stress in their life and in encouraging them to plan constructively either to reduce it or to cope with it in a more positive way. Scores were assigned on the basis of this proposed plan and the patient's apparent motivation to carry it out. It was not possible to work through this process with comparison subjects

and in some cases compliance was difficult to assess. Some of these persons had resumed their previous occupations and were already exposed to familiar stresses whereas compliance for treatment subjects had to be assessed on the basis of projected planning rather than on actual control of stress. Time differences in interviewing the two groups distorted to some extent the compliance scores as it did those of knowledge and post-coronary disability.

TABLE 10

Between-group Comparisons
on Post-coronary Disability

	High	Low
Comparison Group	16	4
Treatment Group	3	15

$N = 38$
$X^2 = 15.20$
$p > .05$

Post-coronary disability was defined as impairment in role performance and reported self-feelings. Marked differences observed between the two groups may reflect the emphasis on gradual but early resumption of activity in the experimental program. Cardiac impairment accounts, in part, for the high scores obtained by some treatment subjects as it does among comparison subjects. The greater number of comparison subjects over sixty may have increased the average higher scores for their group. Their illness may have precipitated an anticipated retirement from work and some active recreational activities, thus resulting in higher role impairment scores.

Reported self-feelings were difficult to score and arbitrary judgments had to be made. Physical well-being may have depended to a large extent on cardiac impairment and recovery time at final interview rather than on compliance. Psychological well-being was reported more frequently by treatment subjects who seemed greatly reassured about their illness and their ability to control it and to enjoy life within the limitations of cardiac impairment.

Conclusion

The question is raised whether the present study supports Melvin Seeman's proposed theory that a negative relationship obtains between alienation and social learning in control-relevant areas of critical life experience. More specifically, the proposition holds that for the highly alienated person motivated avoidance of learning occurs in some range of specifiable circumstances i.e., health, parole, protection against nuclear war.

When patients who experienced an acute health crisis (coronary heart disease) were tested, only weak support for the proposed relationship between alienation and learning was observed. The study results suggest that a comprehensive coronary health instruction program positively affected patients low or high in alienation and this was reflected in their obtaining higher knowledge and compliance scores with lower post-coronary disability scores. Exceptions to these findings occurred in some subjects who gave indications of lower motivation for recovery. Meaninglessness, another dimension of alienation, might be tested in relation to motivation for learning and compliance.

Methodological limitations of the study have been indicated throughout the discussion on findings. A longitudinal study using a multi-dimensional alienation scale and more controls on patient characteristics would be required to evaluate both short-term and long term effects of the experimental program.

CHAPTER V

SUMMARY AND CONCLUSIONS

The problem under study was prompted by the observation that given relatively similar diagnoses and comparable opportunities for expert medical and hospital care, persons with acute coronary heart disease progress to different kinds of prognoses and post-illness adjustment.

An attempt to explain varying outcomes in knowledge obtained about coronary heart disease, and subsequently in compliance to a medical regimen and in post-coronary role disability was made by reference to the alienation theme developed by Melvin Seeman. When personal alienation is defined as perceived powerlessness to control one's fate in critical life situations it is presumed to act as a deterrent to relevant social learning and hence to active control of events. The question is raised whether differential feelings of powerlessness characterizing persons with acute coronary heart disease act as a deterrent to their learning the information about their illness which would enable them to exercise more control over their health status in the future. Presumably, persons who achieve a higher degree of knowledge would be better able to comply to a prescribed medical regimen and hence experience more favourable outcomes.

Thirty-eight male patients under the age of sixty-five with a diagnosis of acute myocardial ischemia and/or infarction participated in the study. There were an equal number in both the comparison group who received varying but essentially

incidental health teaching and the treatment group who were involved in the experimental coronary health education program while in hospital. Data were collected by means of personal interviews using a structured schedule of questions. Comparison subjects were interviewed at their home between two and four weeks following discharge from hospital, while treatment subjects were interviewed upon completion of the instruction program, and once by telephone to assess compliance between one to three weeks post-discharge. Variables measured included alienation, knowledge, compliance, post-coronary disability and selected demographic, epidemiological and medical variables.

A preliminary survey of group characteristics indicated that treatment subjects were lower in alienation ($>.05$) than were comparison subjects. The treatment group tended to be slightly younger on the average, achieved somewhat lower educational and occupational levels, and experienced more severe cardiac impairment than did the comparison group. A comparable number of epidemiological factors appeared to be present in both groups.

It was hypothesized that persons lower in alienation would obtain higher knowledge scores, would be better able to comply to a medical regimen and hence would experience less post-coronary role disability.

Data were first analyzed using the Kendall Rank Correlation Coefficient (r) to assess the degree of association between alienation and knowledge, knowledge and compliance, and between compliance and post-coronary disability in each of the two groups separately. The results indicate a stronger negative relationship (not statistically significant) between

alienation and knowledge in the comparison group. This weak negative correlation observed in the comparison subjects lends some support for the hypothesis, while the even weaker negative association between these two variables in treatment subjects may indicate that some intervening factor, i.e. systematic instruction is negating the influence of alienation. A positive relationship obtained between knowledge and compliance, but only in the comparison group is the relationship strong enough to support the hypothesis. This finding is contrary to expectations, and while treatment subjects higher in knowledge may not have complied accordingly the results may indicate the presence of unknown variables operating in this group as a result of, or unrelated to the experimental program. A weak negative relationship between compliance and post-coronary disability is evident only in the treatment group, while no association obtains for comparison subjects. This does not permit us to conclude that the hypothesized relationship between compliance and post-coronary disability is supported by the data. It may be expected that some other variable such as degree of cardiac impairment is more important in this respect.

In view of the results discussed above, it was further hypothesized that the influence of the experimental program is greater than that of alienation in effecting differences in knowledge, compliance and post-coronary disability. Scores were dichotomized at the median for the two groups combined and the Chi Square Test was used to analyze between-group differences. Results showing the treatment group to fare better on all three variables: knowledge, compliance and post-coronary disability,

were all statistically significant (>.05). Methodological limitations are thought to account, at least in part, for the marked differences observed between these two groups of patients. However since findings indicate the minimal influence of alienation in within-group comparisons for the treatment group, one may conclude that when health instruction is comprehensive and prescriptions clearly defined patients will tend to learn more about their illness and comply more readily to suggested control measures regardless of feelings of powerlessness (i.e. alienation).

A multidimensional alienation scale, separation of the role of researcher from that of instructor and more comparable time lapse between discharge from hospital and final interview for the two groups may have shown stronger support for the hypotheses. Further, the powerlessness version of alienation may not be adequate to explain differences in receptivity to teaching and resultant compliance. Meaninglessness, isolation and self-estrangement may all play a role in deterring recovery and rehabilitation in cardiac patients. A more comprehensive and longitudinal study would be required to evaluate the effects of the teaching program in relation to outcomes.

NOTES

[1] A condition in which a portion of the myocardium has become anaemic due to partial obstruction of the local circulation.

[2] Necrosis with ensuing fibrosis of a macroscopic, circumscribed area of the myocardium due to obstruction of the coronary circulation.

[3] University of Vermont, Burlington, Vermont, August 24-28, 1964.

[4] Health Education Center of Victoria, 3019 Shakespeare St.

[5] Reference is here being made to Merton's (1957) typologies of social structure, i.e., local versus cosmopolitan, which according to Pope et al., (1969) was extended to the study of health and medical care initially by Friedson (1961) and more recently by Suchman (1964, 1965 a.b. 1966) who applied the typologies to the health orientation of individuals, distinguishing between what he called the scientific and popular orientations and relating these to cosmopolitan versus parochial forms of social organization.

[6] A measure of powerlessness was obtained by the use of the 'Alienation Scale' - an instrument composed of twelve forced-choice items adapted from the I-E (internal-external control) Scale developed by Professor Shepard Liverant of Ohio State University.

[7] The alienation measure in this case was obtained from a 40 forced-choice item scale offering a contrast between internal and external control covering a wide range of behaviors. The scale was adapted from the I-E Scale mentioned above.

[8] Alienation items were adapted from the "Anomia Scale 0-5 agree-disagree questions" by Leo Srole in "Socian Integration and Certain Corollaries: An Exploratory Study". A.S.R. Dec. 1956 (Vol. 21) pp. 709-716.

[9] "Desirable Weights for Men and Women aged 25 and over" (in pounds according to height and frame, in indoor clothing). Adapted from Metropolitan Life Insurance Company, New York, New Weight Standards for men and women. Statistical Bulletin 40:3, Nov.-Dec., 1959.

[10] For those high in alienation two possible outcomes may obtain: firstly, the alienation relating to their illness may be increased as these anxious people find re-inforcement for their worst expectations. In this case, the consequences such as extreme behavioural reactions would be highly undesirable; secondly, the sense of alienation could effectively block their receptivity to the information presented so that the experimental effect would be minimal. The exploration of these possibilities is beyond the scope of this study.

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APPENDIX I

QUESTIONNAIRE FOR POST-CORONARY PATIENTS

1. Age _____ 2. Sex _____

3. Before your last illness were you working __? retired __?

4. (a) If employed, what was your job title?

   (b) What specifically were your duties and responsibilities?

   (c) How long have you had this job?

5. Do you believe that becoming a success is primarily a matter of luck or strictly hard work?

6. If retired, what specifically have you done since retirement (rest, general inactivity or what)?

7. Have you been active in clubs or groups? If yes, state specific duties, responsibilities, activities.

8. Were you active in sports, hobbies or other interests?

9. How many years of (a) formal schooling ____, (b) special education ____ did you have?

10. What is your height _____, present weight ____, usual weight ____, body build: slight ___, medium ___, heavy ___.

11. Has your blood pressure been raised in

   (a) the past? Yes ___ No ___ Don't know ___.

   (b) If yes, do you think this had anything to do with your illness, or is it not very important?

12. (a) Are you a diabetic? Yes ___ No ___ .

   (b) If yes, do you think this might have increased your chances of having heart disease, or is it just incidental?

13. (a) Is there a history of the following in your family?

1) heart disease	Yes ___	No ___	Don't know ___
2) diabetes	Yes ___	No ___	Don't know ___
3) high blood pressure	Yes ___	No ___	Don't know ___

(b) If yes, do you think this might have had something to do with your getting these same conditions or not?

14. Looking back over the past years and months, have you any idea what might have helped to bring on your illness? (Probe for knowledge of any known risk factors associated with coronary heart disease and which may be present in this situation.)

15. People say that if you've had one heart attack you're bound to have another. Do you think this is true? (Probe for basis of opinion given, i.e., knowledge of the nature of coronary heart disease and myocardial infarction, or hunch, hearsay, experience.)

16. How much control do you think people have over their own health?

17. Are you a regular church goer? Yes ___ No ___

18. By and large, are you a person who has mostly good luck or do you seem to get more than your share of bad luck?

19. Have things usually worked out in your life the way you wanted them to or have things usually gone wrong somehow?

20. When things have gone wrong for you do you feel you were usually to blame for it, or did they usually go wrong through no real fault of your own?

21. Looking ahead to the next six months, do you expect to make any changes in your life routine, say, in work or social activities?

22. How long a convalescence at home do you expect before returning to work?

Full time _____? Part time _____?

23. Is your income the sole income of the family?

    (a) Yes ___ No ___

    (b) If no, does your spouse ____ children ____ contribute to the family income?

24. (a) Do you have any dependents at the moment?

    (b) How old are they approximately? Wife ____
    Children _____
    (sex, age of each child)

25. Did you ask your doctor whether or not sexual activity would be harmful during convalescence?

26. Did your doctor prescribe any specific activity program for the first four weeks after discharge from the hospital? (probe for details.)

27. Do you have any plans for some form of regular activity program when convalescence is complete? (Probe for details)

28. How will you know when or if you are over-exercising? (Probe for knowledge of healing process following heart injury and role of exercise in the recovery process.)

29. In general, would you say you are the kind of person who usually plans things ahead or do you usually take things as they come?

30. When you make plans ahead do you usually stick to your plans or does something usually come up to make you change them?

31. Do you intend to take steps to reduce some of the tensions that have bothered you?

32. Did you ever regularly smoke cigarettes? Yes ___ No ___

33. (a) If you still smoke cigarettes, how many do you smoke a day?

    (b) Under what circumstances do you smoke cigarettes?

34. How many years have you or did you regularly smoke cigarettes?

35. Do you now or did you ever smoke a pipe and/or cigars?

36. Are you definitely planning to quit smoking?

37. Is there any place in Victoria where a person can go for help in quitting smoking? Yes ___ No ___
Don't know ___

38. Would it help to stop smoking now that you've had a heart attack? (Probe for knowledge of relationship between cigarette smoking and heart disease.)

39. (a) Was a special diet prescribed for you when you left hospital? Yes ___ No ___

(b) If yes, can you tell me about it? (Probe for details)

40. What was the reason for the prescribed diet? (Probe for knowledge of the relationship between blood cholesterol, blood fatty acids and coronary heart disease.)

41. Was your special diet and the reason why you need it explained to your wife? Yes ___ No ___

42. Would you say you manage to follow your diet accurately Most of the time, some of the time, or never?

43. (a) Are you presently taking any medications for your heart condition? Yes ___ No ___

(b) If yes, what do you take? (Probe for knowledge of type of drugs.)

(c) Why was it prescribed? (Probe for knowledge of effects of drugs.)

(d) Do you take it exactly as prescribed or do you sometimes forget to take it or what?

44. How do you feel physically as compared with the way you felt before your illness?

45. How do you know how much rest you should have now and after convalescence? (Probe for knowledge of role of rest and exercise following acute episode of coronary heart disease.)

46. How do you feel generally in your attitudes about yourself as compared with how you felt before your illness? (lack of confidence, different approach to life, etc.)

47. (a) Who makes most of the decisions most of the time in your home? 1) you ___ 2) you and your wife ___ 3) your wife ___

(b) Has this changed in any way since your illness?

48. Who disciplines the children (if any) usually? (a) you ___ (b) you and your wife ___ (c) your wife ___

49. When will you be seeing your doctor again?

50. How much do you think you can control what happens to your own health from now on?

51. Do you believe that what happens to you is mostly your own doing, or do you believe that you don't have much to do with the way your life is going?

52. You seem to have a good deal of information about your illness; how would you say you came about this information? (Probe for sources of information.)

53. Do you have any suggestions on how doctors and other treatment personnel could provide more or better information to heart patients?

Date of Interview _____.

APPENDIX II

INDICES OF LEARNING, COMPLIANCE AND POST-CORONARY DISABILITY

I LEARNING

A. Factors Associated with Coronary Heart Disease

1. hypertension (Q 11(a))
2. diabetes (Q 12(a))
3. heredity (Q 13(a))

Knowledge of the presence of the above factors was rated 1, and uncertainty was rated 0.

Knowledge of the possible relationship between the presence of these factors and present illness was rated from 0 to 3 for no idea, some idea, good idea. (Q 11(b), 12(b), 13(b))

4. lack of regular physical exercise.
5. sudden strenuous physical or mental stress or activity.
6. prolonged stress, tensions or anxieties.
7. tobacco smoking.
8. abnormal triglycerides and/or cholesterol blood levels.
9. overweight.

Awareness of the remaining factors thought to be associated with the occurrence of CHD in each subject was assigned 1 point for each item mentioned out of the possible total of 9. (Q 14) The resulting ratio was weighed and scaled from 0 to 3 as follows: 0 if no factor was mentioned, 1 for a score below the median, 2 for a score at the median, and 3 for a score above the median.

B. Pathology of Coronary Heart Disease (Q 15)

One point was assigned for each of six possible items mentioned. (Range 0 - 6)

1. coronary arteries and their function.
2. hardening of arterial walls with process of aging, and accumulation of lipid and cholesterol deposits causing narrowing of the lumen and diminished blood supply to the myocardium.
3. accidental obstruction of coronary artery with thrombus, causing injury to area of myocardium (infarct).
4. healing of infarct, scar formation, development of collateral vessels.
5. underlying disease (atherosclerosis) still present.
6. possibility of recurrence of infarct unless careful management of atherosclerosis.

C. Management of Health Following Coronary Heart Disease

1. control of activity during convalescence (Q 26). Involves prescription of specific activities and patient's awareness of limitations imposed. One point given for each of four items mentioned. (Range 0 - 4)
   a. self care activities.
   b. general activities about home.
   c. warm-up and tapering-off calisthenics.
   d. graduated walking (speed and distance) and stair climbing.
2. control of activity following convalescence (Q 27). Involves prescription of specific activities and exercises and patient's understanding of principles of physical fitness, including beneficial or harmful effects

of various exercises and activities. One point was assigned for each of four items mentioned. (Range 0 - 4)

a. assessment of post-coronary status.

b. warm-up and tapering-off calisthenics.

c. graduated walking and stair climbing.

d. retraining by means of aerobics, jogging, interval training; i.e., physical reconditioning programs.

3. Knowledge of Relationship between Activity-Exercise and Recovery from Myocardial Infarction. (Q 28)

Controlled graduated activity is required to

a. stimulate general circulation.

b. prevent complications due to stasis of circulation and lung secretions.

c. promote the development of collaterals.

Symptoms indicating excessive strain during exercise are:

d. chest pain and shortness of breath.

e. undue fatigue.

One point was given for each of five items mentioned. (Range 0 - 5)

4. Sexual Activity during Convalescence (Q 25).

Discussion with physician was assigned one point, while lack of advice was assigned zero.

5. Control of Stress Following Acute Coronary Heart Disease (Q 31).

Involves knowledge of the relationship between stress and present illness. One point was given for each of four items. (Range 0 - 5)

a. strong emotions influence the autonomic nervous system which leads to

b. increased secretion of epinephrine and norepinephrine which results in

c. increased cardiac activity, constriction of coronary arteries and elevation of blood pressure, thus

d. straining an already injured heart and further interfering with its blood supply.

6. Avoidance of Tobacco Smoking following Myocardial Infarction. (Q 38)

Includes knowledge of the relationship between tobacco smoking and its effects on the respiratory and cardiovascular systems. One point assigned for each of five items. (Range 0 - 5)

a. nicotine in tobacco stimulates secretion of epinephrine and norepinephrine which causes

b. increased heart action, constriction of coronary arteries and an elevation of blood pressure.

c. carbon monoxide, carbon deposits and other impurities cause diseases such as chronic bronchitis and emphysema which in turn interfere with proper aeration and efficiency of the lungs;

d. resulting in additional strain on damaged heart, possibly leading to enlargement and failure.

e. smoking appears to interfere with the metabolism of lipids and cholesterol resulting in higher blood levels.

7. Avoidance of Foods Rich in Carbohydrates, Saturated Fats and Cholesterol. (Q 39, 40, 41)

Includes knowledge of the relationship between these substances and the coronary arteries and between excess weight and the cardiovascular system. A score of one was assigned for knowledge of type of diet prescribed. (Q 39, 40)

A score of one was assigned for each of six items concerning purpose of diet where applicable. The resulting ratio score was then scaled from 0 to 3. (See Q 14 - etiology)

a. weight reduction and control.

b. control of triglyceride blood levels.

c. control of cholesterol blood levels.

d. control of diabetes.

e. control of hypertension.

f. reduction of cardiac strain from obesity..

8. Medications Following Acute Episodes of Coronary Heart Disease. (Q 43 (a), (b), (c))

A score of one was assigned for knowledge of type, name and purpose.

9. Rest Following Illness. (Q 45 (a))

Involves knowledge of relationship between rest and myocardial injury and recovery. One point was given for each of four items mentioned. (Range 0 - 4)

a. maximal rest required during healing phase 4 - 6 weeks.

b. activity prescribed and controlled during this period.

c. avoidance of excessive activity and harmful type of exercises until post-coronary status is determined.

d. regular short rest periods between various activities, mid-day rest periods and restful night sleep.

10. Follow-up Visit with Physician. (Q 49)

A score of one was given for definite appointment and zero for unspecified visits.

Total maximum learning score = 66.

II COMPLIANCE

Scores on compliance to medical prescriptions were obtained by direct questioning and values assigned as follows: never or seldom - 0; some time - 1; most of the time - 2; all the time - 3.

Items of compliance included:

A. Activity (Q 26 (b))

B. Control of Stress Factors (Q 31 (b))

C. Smoking (Q 36)

D. Diet (Q 41)

E. Drugs (Q 43)

F. Rest (Q 45 (b))

Total maximum score = 18.

Individual scores were variable depending on applicability of prescription. The final score was obtained by calculating ratio of compliance to possible total and percenting the results.

III POST-CORONARY DISABILITY

This was measured according to relative degree of impairment in the fulfillment of family, occupational and social roles. Arbitrary judgments were made and scores assigned as follows: no change - 0; slight impairment - 1; moderate impairment - 2; severe impairment - 3; very severe impairment - 4.

Items of post-coronary disability included:

A. Family roles - decision-making (Q 47)
- discipline to children (Q 48)

B. Occupational role - return to previous occupation or other (Q 22)
- full time or part time (Q 22)
- change of activities in case of retirement (Q 6)

C. Social roles - participation in clubs, groups (Q 7, 21)
- participation in active sports and hobbies (Q 8)

Total maximum score = 24.

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