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Educative/Psychotherapeutic Rehabilitation Groups Following Myocardial Infarction: A Study of Denial and Depression in the Post Infarct Patient

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EDUCATIVE/PSYCHOTHERAPEUTIC REHABILITATION

GROUPS FOLLOWING MYOCARDIAL INFARCTION: A STUDY

OF DENIAL AND DEPRESSION IN THE POST INFARCT

PATIENT

by

Lynn Dee Feldman Lindgren

A Dissertation Submitted to the Faculty of the

Graduate School of Loyola University of Chicago

in Partial Fulfillment of the Requirements for the

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VITA

The author, Lynn Dee Feldman Lindgren, is the daughter of William Feldman and Fredrika (Rosenkrantz) Feldman. She was born June 13, 1946 in Chicago, Illinois.

Her elementary and secondary education was obtained in the public schools of Highland Park, Illinois, where she graduated from Highland Park High School in 1964.

In September, 1964, she entered the University of Michigan, and in December, 1967, received the degree of Bachelor of Science with majors in special education for the emotionally disturbed and the social sciences. While attending the University of Michigan she was active in the Tutorial Project for the Disadvantaged. In 1967 she was awarded a scholarship by the State of Michigan.

In June, 1974, she received the Master of Education degree at Loyola University of Chicago, and was certified as a school psychologist in June, 1975. In 1976 she served as a school psychologist in Evanston, Illinois. In 1977 she was granted an assistantship in Educational Psychology at Loyola University of Chicago. She is presently employed as a psychologist by the Northern Suburban Special Education District.

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INTRODUCTION

Heart Disease is the number one illness in the United States, killing over 950,000 each year. Individuals who have undergone the physical and psychological trauma of a myocardial infarction experience a devastating life-threat. The mechanisms with which the individual copes are varied and often counterproductive to his rehabilitation following the illness. Both depression and denial are widely hypothesized to be common patterns of patient response which inhibit recovery. Depression, following a physical trauma such as a myocardial infarction, is a common occurrence which may be due to many causes such as fear of death, change in locus of control due to hospitalization, and preparations to change a current lifestyle. Denial (i.e. refusing to acknowledge the existence of a myocardial infarction and not to follow a doctor's orders) might severely inhibit the healing process and be detrimental to the patient's health status.

The present study examines an educative treatment program intended to be a helpful and healthful addition to a successful convalescence, and to promote the prolonged

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longevity of the cardiac patient. Individuals who have sustained an infarct are presumed to need to have the opportunity to share their fears and anxieties with others in the same situation and to be educated about their illness. In-patient group rehabilitation therapy following an infarct is intended to provide the patient with an understanding and educative milieu in which he can learn more about his disease and his feelings regarding it. It is presumed that the patient must first learn to accept the reality of the disease before he can devise the means of a healthful adjustment to it. The present investigation tests the following hypotheses: 1. Denial and depression are inversely correlated in patients who have sustained a myocardial infarction. 2. Post-infarct patients who go through an educating and counseling experience, such as coronary rehabilitation classes, will have lower levels of both depression and denial. 3. There is a curvilinear relationship between depression and time. It was expected that the curve would be depicted by the higher levels of depression being at the first and third interviews, and the lowest level at the second interview, indicating an increase in depression both following the infarct and post-discharge.

The traditional role of education has been to explain, demonstrate, and inform. These same goals may be accomplished within other confines than the school walls and with any age of individual. Cardiac rehabilitation groups

aim to fulfill these objectives of education while providing the patient with a sense of control over his life. As in schools and institutions where the psychological aspects of learning and increasing motivation are being implemented, so must knowledge of educational psychology be applied to medical populations. Olbrisch (1977) summarized current research in which psychotherapy was implemented to help treat physical illness. Psycho-educational therapy goals of reducing anxiety, assisting in following treatment programs and increasing acceptance of the illness and its ramifications are highlighted in this study. Medical practitioners and psychologists have begun to cooperate in treating physical illnesses.

REVIEW OF THE RELATED LITERATURE

History of Psychosomatic Approach to Illness

<u>General Assumptions</u>. Alexander and Flagg's excellent his-
torical summary of the psychosomatic approach (in Wolman,
1965) denotes that the first attempts made by the Greeks
to explain natural events from natural causes occurred in
the seventh and sixth centuries, B.C. The cosmological
philosophers' rationalistic approach was applied to the
biological by Hippocrates and his followers. Mental dis-
ease was then thought to be the result of physical illness.
Psychology became the province of the philosophers and de-
veloped as a rational approach by Socrates, Plato and Aris-
totle. The main tenet of Plato and Aristotle was that the
mind rules over the body. However, the Romans believed
that the physician dealt with an indivisible human being
and, thus, were concerned with making the whole patient com-
fortable. Cicero's belief that bodily ailments may be re-
lated to emotional factors resulted in the birth of psycho-
somatic medicine.

Although demonology was the basic explanation for
psychosomatic disorders for centuries, eighteenth cent-
ury physicians and scientists considered it only a matter of

time before the mental and physical diseases of the body
would be understood on the basis of anatomy, physics, and
chemistry.

The term, "psychosomatic," was used by the German
psychiatrist, Heinroth, to refer to somatic effects of psy-
chological conflict in the early 1800's. At the end of the
nineteenth century, Charcot experimentally demonstrated the
influence of ideas upon bodily disturbances in hysteria.
Following Charcot, Freud's work created a rift in psychia-
try between the psychological and the organic orientations.
The current psychosomatic approach appears to be an effort
to find common ground between these two orientations.

Applications in Cardiovascular Disease. The general popu-
lace, as well as clinicians, has long assumed an etiological
relationship between stress, especially suppressed anger,
and heart disease. However, studies investigating this
phenomenon were not conducted until the middle 1940's.
Gildea (1949) found, in evidence gathered from psychiatric
interviews, that certain patterns of personality malfunction
are common to specific psychosomatic disorders. Some of the
conditions considered were ulcerative colitis, hypertension,
coronary diseases, and bronchial asthma. He also found that
patients with coronary disease respond with an arrest of
symptoms relatively frequently to a variety of guidance and
authoritarian modes of therapy.

Cleveland and Johnson (1962) studied twenty-five males hospitalized for recent myocardial infarction as compared with similar data on twenty-five males awaiting serious surgery. It was discovered by means of psychological tests that both presurgery and post-infarct patients reflected special anxiety regarding imminent death and physical incapacity. In addition, post-coronary patients revealed a pattern of restlessness, underlying passivity and suppressed hostility which the author thought may have some bearing on their propensity for coronary disease.

Chambers and Reiser (1953) reported the effect of emotional stress on twenty-five patients and established that 76 percent of the cases of cardiac decompensation were precipitated by emotional tension. Likewise, Mainhardt and Robinson (1962) reported that the incidence of Stokes-Adams Syndrome (a condition which frequently accompanies heart block) correlated significantly with the patient's unsatisfied dependency strivings and precipitation of his complete heart block.

Adsett's et. al. (1962) study of coronary blood flow established psychophysiological correlations between intentionally stressful interviews and coronary blood flow, blood pressure, pulse rate, and cardiac output. Anxiety and anger also were found to increase the rate of the flow of blood.

Theoretical Assumptions Underlying Psychological Treatment

of Psychosomatic Problems

Psychoanalytic Treatments. It is Freud's (1954) basic theory that if one can arrange a special set of conditions and have the patient talk about his difficulties in certain ways, then behavioral changes can be effected in behaviors which appear to be inaccessible to change by any other method. It has been used to treat patients with psychosomatic disorders. As a treatment choice, Fine (in Corsini, 1973) states that it is effective on a short-term basis to confront dependency needs and then terminate therapy during positive transference.

Behavioral Treatments. Goldstein (in Corsini 1973) defines neurotic behavior as, ". . . any persistent habit of unadaptive behavior either acquired by learning or as an unlearned response occurring in situations which are the result of unadaptive learned behavior in a physiologically normal organism." The author purports that this statement takes into account psychosomatic behaviors. Behavior therapy for patients suffering from these disorders can take the form of unearthing the patient's behavioral repertoire and through role play, desensitization and assertiveness training, develop better adaptive behaviors.

Encounter Therapy Groups. The main purpose of encounter, Schutz (Corsini, 1973) states is to help an individual become more aware of himself. The patient must join the group

voluntarily, thus assuming responsibility for his actions.
The group format concerns itself with relations among people,
and deals with openness and honesty to avoid self-deception.
Encounter theorists believe that emotional trauma can alter
the course of physical development, i.e. psychosomatic dis-
orders, and that body tensions weaken organs, making them
more vulnerable to disease. Thus, encounter groups can
either supplement more traditional therapy or be used as the
sole method.

Experimental Bases of Contemporary Approaches to Treatment
Western Electric Study. The University of Illinois' Western
Electric study, conducted for five years, was established to
distinguish between the characteristics of a male population
believed to be free of clinical coronary heart disease and
men developing the disease during the course of the study.
In a fallout study, Lebovitz (1967) found a significant
difference between the two groups with regard to those de-
veloping heart disease showing the factors of elevated blood
pressure, elevated blood cholesterol, ST and T-wave abnorm-
alities, and the excessive use of coffee and cigarettes.

The strength of these studies lies in the longitu-
dinal, long-term aspects of the experiment, thus allowing
real change to occur when possible.

Type A/B Personalities. Recent research on heart disease
is accumulating evidence that psychological factors and life

styles have an important involvement in the etiology of this disability. Rosenman's "Type A" (Jenkins, 1971) coronary behavior has been related to increase in coronary heart disease in research studies since the late 1960's. This pattern can be characterized by "extremes of competitiveness, striving for achievement, aggressiveness (although sometimes stringently repressed), haste, impatience, restlessness, hyper-altertness, explosiveness of speech, tenseness of facial musculature and feelings of being under the pressure of time and the challenge of responsibility. Persons with this pattern are usually deeply committed to their job or profession and often have achieved success in it." Lebovitz (1974) attempted to refute the Rosenman hypothesis by contending that there exists more than a bipolarity between "A-ness and B-ness," and examined the problems of personality dimensions with regard to response sets and the question of whether personality itself can be treated as a significant risk factor for coronary heart disease in its own right. His MMPI study was able to distinguish factor loadings that underlie the three groups (non-coronary, myocardial-sudden death, angina pectoris). It was discovered that there was an absense of overlap between the psycholigical variables measured by the MMPI, and the physiological variables of blood pressure, cholesterol and smoking in the non-coronary group. However, this overlap was present in both the angina and the MI groups. Thus it was found by a large number of

factors present for each group, that the Type A pattern
should be subdivided, and other patterns could possibly be
added. The study did reiterate many previous ones by again
showing that individuals of some specific personality patt-
erns have a greater proness for acquiring coronary heart
disease when their physiological measures are equalled with
non-coronary individuals.

Sisyphus Reaction. Bruhn et. al. (1963) in their study of
the "Sisyphus reaction" added yet another dimension to the
"Type A" personality and prediction of survival. The Sisy-
phus pattern is characterized by "an effort-oriented person
who strives against odds, but with very little sense of ac-
complishment or satisfaction." The authors, using a com-
bination of psychiatric interviews, Friedman-Rosenman's
Type A interview, and the MMPI D-scale, were able to iso-
late patient from healthy controls and correctly predict
sudden death or myocardial reinfarction in seven out of
nine patients. These findings indicate that the Sisyphus
reaction was as correct in isolating coronary heart disease
patients as the Type A interview. Since the loading of
these factors had prognostic significance for survival, the
research suggests that further investigation of prophalac-
tic techniques is advisable.

Additional Studies. Many of the studies mentioned used
angina pectoralis patients as one of the groups isolated in
the coronary research. Ostfeld et. al. (1964) emphasizes

in his study the importance of maintaining the division between these and the MI patients, since the angina patients showed a greater tendency toward hypochondriasis, emotional lability and suggestability, and greater fluctuations in cardiovascular functioning than the MI patients and healthy controls. The evidence further substantiated that patterns of behavior are significant in the epidemiology of coronary heart disease, although a significant difference between infarct and non-coronary groups was not found on the MMPI scores.

A study by Caffrey (1968) discusses reliability and validity assessments of some personality and behavioral measure obtained in a study of Benedictine and Trappist monks. The atmosphere of the monasteries as well as the personalities of monks and priests were evaluated according to "Type A" patterns. It was found that the type A atmosphere combined with the Type A personality variables produced a higher rate of myocardial infarction in the religious population. Those monks and priests whose lives the most closely approximated the pace that is typically American tend to have the rate of heart disease that is also typically American.

Depression and Denial: Some Common Factors

Depression Defined. Wittenborn (in Wolman, 1965) defines the depressive reaction as anxiety that is allayed and partially relieved by depression and self-depreciation. The reaction

is precipitated by a current situation, frequently by some
loss sustained by the patient, and is often associated with
a feeling of guilt for past failures or deeds. The degree
of reaction in such cases is dependent upon the intensity
of the patient's ambivalent feeling toward his loss (love,
possession) as well as upon the realistic circumstances of
the loss.

The term is synonymous with "reactive depression"
and is to be differentiated from the corresponding psychotic
reaction. In this differentitation, points to be considered
are (1) life history of patient with special reference to
mood swings (suggestive of psychotic reactions), per-
sonality structure (neurotic or cyclothynic) and precipi-
tating environmental factors and (2) absence of malignant
symptoms (hypochondriacal preoccupation, agitations, de-
lusions, particularly somatic, hallucinations, severe guilt
feelings, intractable insomnia, suicidal ruminations, severe
psychomotor retardation, profound retardation of thought, or
stupor).

Akiskal (1975) in his comprehensive review of the
literature on depression succinctly describes the current
findings in this area. The studies described relate de-
pression to physiological variables and how it is often
associated with negative improvements in individual psycho-
therapy.

Studies Relating to Depression in Myocardial Infarction.
When the body is in a stressful situation, there is in-
creased sympathetic system activity. Central nervous system
arousal increases catecholamine excretion such as epine-
phrine and norepinephrine. Since norepinephrine increase
has been related to aggressive, hostile coping mechanisms
and increased epinephrine levels are related to passive, un-
certain or anxious responses, a relationship between these
behaviors and catecholamine levels was hypothesized by
Klein, Garity and Gelein (1974). Their study used daily
checklists of patients in the coronary care unit which in-
cluded norepinephrine/epinephrine urinary outputs, daily
physiological data and behavioral inventory. The results
showed a positive and significant relationship between hos-
tility, depression and epinephrine excretion. There was no
significance found between norepinephrine excretion and ex-
pression-repression dimensions in this study. The authors
referred to the patients as "adjusting to," "coping with"
the anxieties associated with an infarct when they displayed
a reduction in distress and increase of positive feelings.
(This reviewer sees this as an instance of denial, which was
not covered in the study).

Bruhn (1969) using the MMPI as a pre and post meas-
urement, and psychological and physical indices over a
seven-year time span, discovered that patients who died
during the period scored significantly higher on the de-

pression subscale at the time of entry. Like the Shekelle and Lebovits study, the non-survivors had higher scores on Hy, Pd, and Pt scales than survivors. It was suggested that depression may be an important indicator of the approaching demise of the patient. Physiological changes were not positively correlated with depression.

Naditch, Gargan and Michael (1975) found that the use of denial as a defense mechanism may have a high degree of interaction with depression. Denial and depression were negatively correlated, and in their multiple regression procedure, had both significant and main effects when considered with anxiety, locus of control, and discontent. The authors also found support for the observation that depression may be the result of the inability to effectively deny when faced with a threatening situation. Their main findings were consistent with their hypothesis that depression and anxiety can be associated with a belief in external control and are positively correlated.

Rosen (1966) agrees with the previous studies that state that the most frequent reactions to heart disease are anxiety, depression and denial of the illness. The patients referred to either failed to comply to the prescribed medical regimen, or over-reacted and over-protected themselves. Depressive symptoms were evident as loss in self-esteem, but not seen as death wishes or irritability. The hypothesis that age is an important variable in the psycholog-

ical reaction of male patients to an MI was supported by results on interviews rating depression, denial and anxiety. The patient group showing significantly higher scores in all dimensions was composed of men from 50-59 years of age. The author drew an analogy between this period of life and that of adolescence to support the belief that "...men still cling to achievement-autonomy goals, feeling they must push on; yet have begun to doubt their ability to reach these goals, and while some are no longer certain that the rewards of striving are so desirable, they are reluctant to retreat from the struggle." Thus, the heart attack confronts the self-esteem of a man in his 50's most severely and renders him depressed.

Kavanagh and Shephard (1975) support Rosen's findings and expand them to describe data suggesting a bimodal distribution of patients. One group had a "normal" score on the MMPI apart from a tendency to hypomania. The other had severe depression with associated hysteria, hypochondriasis and psychasthenia. The severely depressed patients were older with a greater tendency toward hypertension and angina. The authors feel that the two types of patients require opposite approaches to therapy by the rehabilitation team: the normal, hypomanic needs restraint whereas the depressed individual needs encouragement. Of the two groups, the depressed patients benefited most from psychotherapy.

Denial Defined. Neff and Weiss (1955) define denial as
a very primitive psychodynamic mechanism in comparison with
other defenses. They found that patients who verbally den-
ied their disability explicitly had, premorbidly, regarded
ill health as an imperfection, weakness or disgrace. They
continue to state that denial operates in what they call a
"hedonic system or belief" where what gives relief or satis-
faction is "true" and what causes unhappiness is "false."
Denial can also operate as a neurotic mechanism, an ego-
protective device for non-brain-damaged people.

Studies Relating to Denial in Myocardial Infarction Patients

Croog (1971) in his often-referred to study on den-
ial in male infarct patients, could not dispute the hypothe-
sis suggested by others that the "tendency toward denial is
a general characteristic of heart patients." Findings in
Croog's study associated denial with the ethnic backgrounds
of both Jewish and Italian patients. He also made the sug-
gestion that, although deniers reported being more often de-
pressed than nondeniers, their depression was less severe.
Patients displaying denial may disregard significant symp-
toms that would hinder medical care and rehabilitation. Al-
though he characterizes denial as a means of coping, he sug-
gests that it can be fatal for the heart patient if used to
extreme.

Hackett and Cassem (in Abrams, 1970) first defined
denial as "the conscious and unconscious repudiation of all or a

portion of the total available meaning of an illness in order to allay anxiety to minimize emotional stress." In their study of MI patients attached to an audible-beep monitor-pacemaker, they discovered that the patients presented their defense in three distinct patterns. They use the term "major denial" to describe those patients who stated "unequivocally and unremittingly that they experienced no anxiety as a result of their illness, or during their time on the monitor-pacemaker." The term "partial denial" was applied to patients who denied initially their fears concerning the infarct and supporting apparatus, but who eventually admitted concern about the illness. "Minimal deniers" were those who may not complain of anxiety, but would admit to it when questioned specifically. The authors discovered that social-economic status did not have an effect on the manner in which patients responded to an MI. Both categories of blue and white collar workers tended to deny to the same extent. There were more major deniers among blue collar workers, and no minimal deniers among white collar workers. Previous MI had no effect on extent of denial used. Hackett and Cassem found that denial was effective (although this is not explained), and had a role in fending off depression.

Bishop (1973) presents the theory that the physician is the most important person in the physical rehabilitation of the patient. Because of this fact, he emphasizes the

importance of the physician's emotional stability to coun-
teract the emotional liability of the recent MI patient. He
further describes the usual pattern of denial and depression
that he witnessed in his coronary patients. Along these
lines, Ostfeld, Lebovits, and Shekelle (1964) mention that
the infarct group they studied "complained about their
health even less than is usual within the non-coronary
group." Rather than an index of adjustment, it appears to
be an index of denial. Wrzesniewski (1975) found in his
study of male, white-collar workers at a rehabilitation
sanitorium following myocardial infarct, that the attitude
favoring the rehabilitation process was a "high level of
acceptance of the diagnosis and medical recommendations;
optimistic expectations as to the future; low level of care-
demanding attitude; and an even-tempered mood." The atti-
tude found to most impede rehabilitation was a lack of ac-
ceptance of medical diagnosis and recommendations combined
with either depressed or manic-unrealistic optimism.

Greene, Moss and Goldstein (1971) in their study
concerning denial in coronary heart disease state that the
term and concept of denial is overused and often abused
when describing patients' reactions. He hypothesizes that
rather than using the defense mechanism of denial, these
patients are either repressing into the unconscious or
suppressing into the preconscious the likelihood that they
have heart attack symptoms. These mechanisms of ignoring

the thought may be quite conscious and "reinforced by rationalizations, displacements, magical thinking, isolation and undoing or reaction formation...these reactions are not as acutely evasive as denial." On the other hand, Hackett and Cassem (1969) see the infarct patient using denial at the three levels based on the patient's expression of anxiety when hospitalized. Olin and Hackett (1964) also noted denial in MI patients when fear of death was not expressed by 31 out of 32 of the men in the study.

Gentry, Foster and Haney (1972) using Hackett and Cassem's major, partial and minimal denier classifications in their study of heart patients, found that the defense mechanism of denial appeared to be a major determinant of the anxiety level of each patient. The "deniers" reported less anxiety than a normal, unstressed individual, and also reported to notice no change in their health status prior to hospitalization and while in the coronary care unit. The degree of depression reported by the patients themselves remained fixed over time. The level was described as being midway between that found in normal non-depressed individuals and severely depressed psychiatric patients. Therefore, while depression is common among post MI patients, it is rarely so severe as to warrant antidepressive medications. The authors noted that of the two patients who expired after the study, one had reported levels of depression equal to that of hospitalized depressive reaction patients.

Levine and Zigler (1975) found that hospitalized lung cancer and heart disease patients all evidenced some degree of denial when they responded to a questionnaire as not being any more dissatisfied with their present level of functioning than did healthy controls. They denied having higher aspirations rather than their real level of functioning. Among their patient groups, the stroke patients employed denial more successfully than the lung cancer patients, and both more than the heart disease patients.

Froese (1974) studied denial in myocardial infarction patients using the Hackett-Cassem Denial Scale (1974). He discovered that these individuals could be classified as either deniers or non-deniers. Those who typically use denial as a defense maintained a higher level of denial after the original threat had vanished. This person did not need anxiety in order to deny as the non-denier did. Depression was found to drop midway through hospitalization for the deniers only. Denial returned to the admission level for both groups just prior to discharge.

Doehrman's comprehensive review (1977) describes the three categories which affect a MI patient's recovery and rehabilitation process. These subdivisions are advocacy (non-scientific emotional reactions, counseling), clinical (impressionistic observations of emotional states of patients and family members) and empirical (scientific examination of some issues regarding the social-psychological

functioning of the patients). Doehrman concludes that about
one-half of the patients studied reached the hospital within
three hours after the onset of symptoms, that there is no
adequate evidence to prove that intensive care unit(ICU) pro-
cedures cause short-term or long-term emotional disturbance
for the patients, that depression generally does not occur
during the first two weeks, that emotional distress of most
MI patients reaches a peak after hospital discharge during
convalescence, and many psychological and social counseling
programs probably reduce the emotional distress to patient
and family that is caused by acute coronary heart disease.

Current Trends in Treatment

Trends as Reported in the Literature. Ohlmeier, Karstens,
and Kohle (1973) describe the use of group-analytic methods
with infarct patients. The authors used the-group-as-a-whole
approach to interact with the therapist. Various defenses
(rationalization, denial, identification with the aggressor)
were utilized to combat the deep fear of loss of identity.
The authors found that it was difficult to distinguish be-
tween the "myocardial infarction personality, and the post-
myocardial psychic reactions to the illness."

Heffron (1974) found that group therapy with chronic
diseases afforded the patients the opportunity to share
problems and relieve anxieties. The author sees the phy-
sician as taking the role of therapist and establishing group
goals. The therapist should remain in the background and

allow the group to develop and interact. Felton and Swinger (173) agree with the methodology, and emphasize the importance of the "here and now" situation of a group. The authors found that the group encourages its members to express problems, feelings, and attitudes they may have kept hidden privately with the therapist. As the patients relate to one another, they are able to learn more about themselves and can generalize new learned behaviors to the outside world.

Rosen (1975) supports this view on the effectiveness of using group therapy with chonic diseases. He adds that the patients benefited from the opportunity to express themselves and to change their attitudes about their illness toward a more realistic appraisal. Dudley et. al. (1969) in their study on chronically ill patients with irreversible diffuse obstructive pulmonary syndrome (DOPS) found that these patients typically used the defense mechanisms of denial repression and isolation in order to survive. Dudley et. al. (1969) infer that physicians see these defenses as a means of protection from dangerous symptoms and behaviors. This means of adaption decreased the depression response in the face of a life change. (This was surmised, but not tested). The patients were asked to particpate in group therapy, those patients who dropped out have more acute symptoms and fewer psychosocial assets. In the group, many strong emotional reactions were ventilated that evidenced the

decreased use of denial through the group process.

Rahe et. al. (1975) found that group therapy sess-
ions did educate the infarct patient as to the management
and nature of his disease. The study also found that the
greater the medical understanding of the disease, the great-
er the motivation to join a physical fitness program, and to
understand the psychological factors related to the infarct.
Pozen et. al. (1977) in their study of nurse rehabilitator
found that educating and counseling the patient increased
the return to work rate and decreased smoking.

Ibrahim (1974) also discovered that members of a
psychotherapy group following myocardial infarction exhib-
ited "less social alienation, shorter hospital stays and
a favorable attitude toward group psychotherapy." The
author mentions "survival experience" but does not speci-
fically discuss if increased survival rates were found for
group patients. Adsett and Bruch's (1968) earlier research
discovered that post-MI patients exhibit considerable
anxiety for several years. Their patients also expressed
loss of self-esteem and conflict over their dependent/
independent relationship with their wives. The wives were
also involved in a separate group for spouses of MI patients.
They expressed feelings of guilt and anxiety, but lacked
the rapport and shared support seen in the patient group.
At the time of publishing the study, the survival rate for
those in the group was higher than for those patients who

refused to join. Larter's (1976) study on MI wives em-
phasized the value of information and advice from the
nursing staff. The nurse as a liaison between the physician
and the wives can communicate more easily, and relate well
with these concerned women. McGann's work (1976) on group
sessions for MI wives and other family members also found
that responding to the family's concerns about the MI
patient is very helpful in their acceptance of the illness
and how to treat the patient when he returns home.

Steger and Chisholm (1977) studied Rumbaugh's
Cardiac Adjustment Scale (CAS) to investigate its use in a
cardiac rehabilitation program. They tested its predictive
powers in estimating psychological adjustment, patient
involvement in rehabilitation and vocational outcome of
rehabilitation efforts. Overall, the CAS was found to have
little usefulness to make any of these predictions. In
another study on psycho-social adjustment, Zheuthen and
Goldstein (1977) sought to develop a series of predictive
equations to relate concurrent physiological, psychological
and socio-demographic variables with levels of future ad-
justment in a sample of the cardiovascular patient popu-
lation. It was found that subjects who can be stressed to work
levels that approximate 70 to 80% of age and sex predicted
maximal heart rates while remaining free from signs of
cardiac dysfunction tend to report themselves to be better
adjusted than subjects who fall at the other extreme of this

physiological indicator. They also discovered that MMPI scales (1, Hy, F, D. Sc) and an objective, readily derived index of cardiac status account for slightly more than 70% of predictable variation.

Services Available in the Metropolitan Chicagoland Area

Inpatient Programs. At the time of this writing between ten and fifteen hospitals are presently offering educative/psychotherapeutic classes to their MI patients. It is generally the attending physician's choice as to whether the patient should have the opportunity to join. The programs' contents vary little from each other because most are concerned with the management of stress, anatomy and physiology of the infarct, and nutrition.

Outpatient Programs. Of the hospitals surveyed, only two were found to have outpatient programs for those patients who had been involved in the in-house classes. They were structured to have controlled exercise, and one had psychological services available.

Outpatient Programs not Related to Inpatient Programs. St. Francis Hospital is in the process of planning a program of this sort for former MI patients not previously involved in rehabilitation classes. They will stress the same aspects of their in-hospital program, and have an exercise program as well.

Heart Clubs. There are several heart clubs in the Metro Chicago area. Once a month they meet to share concerns and hear a speaker. Both former MI patients and patients whose present condition could lead to an infarct, as well as interested family members attend.

YMCA Exercise Programs. YMCA's and other night programs are now available to offer supervised exercise for heart patients. Stress tests are provided, and the exercise is systematically planned according to the patient's heart status.

Treatment Programs at the Hospitals Used in the Present Study.

St. Francis Hospital and Lutheran General Hospital both operate a five-day program led by a nurse practitioner. The information presented is in Appendix B, as well as various handouts. Their programs include a graphic presentation of the normal heart, definition of myocardial infarction and its ramifications, risk factors associated with heart attacks, exercise, future plans and coping strategies.

Relationship of These Procedures to Contemporary Research and Practice. The literature describes various procedures that have been successful in treating MI patients. The hospital programs integrate the knowledge that the patient must understand his disease and learn to cope with it.

Summary

In summary, within the past decade, we have had an influx of research concerning personality types prone to sustain myocardial infarctions. The research in the late 1960's noted the "Type A" personality type defined by Rosenman as having a higher incidence of heart disease. Concurrent studies were performed several times to substantiate this theory. Further research differentiated between angina pectoralis patients and those having sustained MI's along psychological variables. Angina patients were shown to display a greater tendency toward emotional liability and hypochondriasis than MI patients. MI patients were also shown to have a positive relationship between depression and hostility and epinephrine excretion.

Denial, as well as depression, became a focus of attention when several studies supported the interpretation that the MI patient utilizes this defense mechanism as a general strategy to cope. However, when denial is over-employed, it could possibly be fatal for the patient, because he would have a tendency not to follow doctor's orders during convalescence. Some studies further hypothesized that denial may decrease or ward off depression in the MI patient, but never successfully tested this proposal. Depression, it is suggested remains constant over time, and the level is between that found in normal non-depressed individuals and psychiatrically depressed patients. The degree of depression in the

MI patient is rarely so severe as to require antidepressive medication. A contradictory study reported that patients with higher levels of denial become less depressed midway through their hospitalization. Several authors reported that MI patients who scored exceptionally high on depression indices had a higher mortality rate than other MI patients. This higher level of depression could possibly be a result of ineffective denial as one author discussed.

Different modes of psychotherapeutic and educationally oriented groups have been investigated. The findings indicate that the opportunity for the patient to express himself results in changing his attitudes toward his illness and allows him to view it more realistically. This sharing of feelings and increased information about coronary illness proved to shorten hospital stays and create a positive attitude toward group therapy. Also included in the studies is some discussion of spouse and/or family groups. The purposes of the spouse and family groups are the same as the patient groups. It was found that the wives involved in the groups were able to accept the illness better and valued the opportunity to share their concerns with an informed person.

Thus the current research on psychology in medicine, and specifically relating to cardiac patients, is becoming a new and prolific area of interest.

METHOD

<u>Sample</u>

Twenty-nine male patients who had been hospita-
lized in a coronary care unit with a diagnosis of myo-
cardial infarction as determined by the house staff of
each of the hospitals used served as subjects in the pre-
sent investigation. The patients selected did not have
any other acute medical problems as determined by their
medical histories. Twenty-nine patients between the ages
of forty-four and seventy-three years of age were studied.
Four MI patient groups were examined: 1. Current patients
from St. Francis Hospital involved in cardiac rehabilita-
tion groups. 2. Current patients from St. Francis Hospital
not involved in cardiac rehabilitation groups. 3. Current
patients from Lutheran General Hospital involved in cardiac
rehabilitation groups. 4. One patient from Lutheran General
not involved in cardiac rehabilitation. Table 1 presents a
numerical description of the subjects according to age, oc-
cupation, education, previous cardiac status, location of
infarct, and race. Prior cardiac status was determined from
patient records and consultation with attending physicians.
Present health status was also determined by attending phy-
sicians.

TABLE I.   DEMOGRAPHIC AND CLINICAL CHARACTERISTICS
                OF THE FOUR   PATIENT GROUPS

Subjects	St.Francis in-treatment N=8	St.Francis not in-treat-ment N=13	Lutheran General in treatment N=7	Lutheran General not in-treat ment N=1
Age				
Range	48-62	44-73	44-63	57
Mean	56.142	58.714	54.857	57
Race				
White	7	11	6	1
Nonwhite	1	2	1	
Occupation				
Professional	1	3	1	
White collar	2	6	5	1
Not white collar	5	4	1	
Education				
Below High School Graduate	3	2	1	
High School Graduate	2	3	4	1
Some college	2	3		

TABLE I Cont.   DEMOGRAPHIC AND CLINICAL CHARACTERISTICS
OF THE FOUR PATIENT GROUPS

Subjects	St.Francis in-treatment N=8	St.Francis not in-treatment N=13	Lutheran General in treatment N=7	Lutheran General not in-treatment N=1
College Graduate		2	1	
Some graduate level courses		1	1	
Graduate degree	1	2		
History of previous MI				
Yes	1	4	2	
No	7	9	5	1
Location of MI				
Anterior/lateral	5	4	1	1
Interior/posterior	2	4	3	
Diaphramatic	1	3	1	
Not indicated		2	2	

Procedure

Procedure for Acquiring Subjects

      The researcher initially contacted the Chief of
Cardiology and/or Medicine at the respective hospitals to
gain their approval. When necessary, a presentation to
the research committee at the hospital followed in order
to acquire approval for the research design. The attending
physician documented the myocardial infarction according
to cardiac enzyme levels and electrocardiogram changes.
After the patient was determined to have sustained an in-
farct, his attending physician was contacted by the re-
searcher to gain approval for the patient to be interviewed.

Interviewing Procedure

      The patients concerned were interviewed two times
in the hospital, on the third and seventeenth days of hos-
pitalization. A small fraction of the sample were dis-
charged prior to the seventeenth day, and were contacted
by mail. Each hospital session was approximately twenty
minutes in length. The third interview was conducted by
mail ninety days after the patient's admission date to the
hospital. If the patient did respond within a week, the
interviewer recontacted him by phone and by mail.

Presentation of the Interview to the Patient

      Each subject was informed that the author is a
Ph.D. candidate in Educational Psychology at Loyola Univer-
sity of Chicago. It was explained to him that this is a

study of the effect of cardiac rehabilitation on people who have gone through an illness similar to his. The same instructions were given to each patient before the tests were presented.

The Interview

The first interview consisted of: a deomographic questionnaire and denial scale given verbally to the patient. When he was able, he filled out the Depression Adjective Checklist (DACL) himself. If not, the interviewer did it for him. The second and third sessions consisted of administration of the depression scale and the portion of the denial scale that did not require nursing affirmation and communication.

Physiological Tests

Table II displays electrocardiogram changes and cardiac enzyme levels which were followed to reveal physiologic changes across days per each patient in the sample as recorded by the hospital.

TABLE II.

RANGES AND MEANS OF CARDIAC
ENZYMES OF TREATMENT AND
NON-TREATMENT GROUPS
MEASURED AT HIGHEST POINT

GROUP	CPK*		LDH**		SGOT***	
	Range	$\bar{x}$	Range	$\bar{x}$	Range	$\bar{x}$
In treatment	2340-128	873.0	1340-131	441.923	446-33	143.615
Not in treatment	2290-93	782.4	1380-119	442.0	739-52	205.0

* CPK=Creatine Phosphokinase, normal range: 0-100

** LDH=Lactate Dehydrogenase, normal range: 7-26

*** SGOT=Serum Glutamate Oxalacetate Transminase, normal range: 55-134

Instrumentation

Depression Adjective Checklist (Bernard Lubin)

The Depression Adjective Checklist measures sub-
jective depressive mood, and provides brief, reliable, and
valid measure of transient depression. The DACL has seven
checklists with high internal consistancy (.79-.90). Split-
half reliabilities range between .82 and .93 for a normal
population (Buros 1976). The forms are considered to
be parallel for no significant differences were found
among the lists. Validity is shown by the DACL's ability
to discriminate between depressed and nondepressed patients
and "normals". The DACL correlates positively with both
the MMPI D-scale and the Beck inventory. It is considered
effective for the repeated measures use.

Hackett-Cassem Denial Scale

The Hackett-Cassem scale measures denial in the
patient who has sustained a myocardial infarction. The
authors are presently developing other validating proced-
ures, but the scale effectively quantitatively separates
and identifies three clinical groups of deniers: major,
partial, mild according to their total scores on the scale.
The group of patients upon which the instrument was de-
signed, showed differences between pairs of mean scores
for each of the three denial groups that were highly sig-
nificant. Reliability coefficients (test/retest) of from
.71 to .87 were significant at the .025 level.

Demographic Questionnaire

The questionnaire was developed by the investigator to gather demographic data. It appears to be reliable as the information given by the patient can be checked on hospital records and by contacting relatives. Validity is assumed in that the patient is expected to give honest responses. Also, the information gleaned from the instrument is pertinent and the questions are expressed in a manner consistent with other forms commonly in use.

Statistical Analysis

Since only two hospitals were available for this study, it is assumed that each of the two hospitals is a randomly selected hospital representative of the general hospital population-at-large. Furthermore, it was felt that any differential treatment effect would be independent of hospital. There did not appear to be any compelling reason to assume that any such treatment x hospital interaction would exist. Unfortunately, for logistic reasons, no control group could be accommodated in one of the hospitals. This left a vacant block of necessarily missing data as one-fourth of the entire three-way split plot design was vacant.

The hospital programs were assumed equivalent, in that St. Francis Hospital rehabilitation classes were specifically modeled after those at Lutheran General. Different people comprised the psycho/educative staffs of each hospital.

Their theory, handouts, diagrams, and group structure were close to identical. Both are suburban hospitals drawing from a very similar population racially, educationally and occupationally. The atmosphere of both coronary care units is essentially the same, and although St. Francis Hospital's facility is more modern, patients at both hospitals are in constant observation and monitoring by the staffs. These similarities made it possible to consider the variables as in treatment (involved in psychoeducative rehabilitation classes) and not in treatment (not involved in classes).

Due to these constraints, it was decided that the analysis of the corresponding two-way split plot (treatments over time) realized by collapsing on the hospitals variable would not suffer greatly in comparison to the incomplete and unbalanced three-way split plot which was the original design of choice.

The hypothesis that depression and denial are inversely correlated was tested by correlational methods utilizing the Pearson's Rank Order Correlation Coefficient. Patients from all four sources were used for this test. The hypothesis is stated: Denial and depression are inversely correlated in patients following a myocardial infarction.

A split plot factoral design was used to test the hypothesis: Post-infarct patients who go through an edu-

cating and counseling experience such as the coronary
rehabilitation classes, will have lower levels of both
depression and denial. Analysis of variance procedures
follow to determine the main effect by groups and by
repeated measures.

Quadratic trend procedures were to be used to test
the hypothesis that there is a curvilinear relationship be-
tween depression and time passed since onset of MI and
denial and time for the post myocardial infarction patient.

Denial is measured by the Hackett-Cassem Denial
Scale. The scale has a range of scores from 0-64. De-
pression will be measured by the Depression Adjective
Checklist which as a range of scores from 0-32 (34 on
some forms).

RESULTS

The null hypotheses may be stated thus:

1. H_O: ρ Depression x Denial < 0, t=3d, 17d, 90d

2. For Depression:

    H_O: μ treatment = μ non-treatment

3. For Denial:

    H_O: μ treatment = μ non-treatment

The results of the experiment indicate that the null hypotheses, as originally conceived, cannot be rejected. The following description and display of the data collected and tested explains the design of the experiment, the scoring of the data, the three null hypotheses, the calculation of power, and the trends of the constructs, denial and depression, over time.

Design

The proposed design was to have been a three-way split plot factorial over Treatments, Hospitals and Time. However, due to the problem posed by a virtually vacant block within one of the two hospitals, and in view of the assumption that no hospital interactions were expected, the variable, Hospital, was collapsed, leaving a two-way split plot over Treatments and Time. It was considered most

effective to collapse on the hospitals variable due to the equivalency of the programs at each, and also due to the lack of a control group at Lutheran General Hospital. This empty block (one-fourth of data necessarily missing) would have resulted in an incomplete and imbalanced three-way split plot, so the two-way split plot was the design of choice.

The following table displays all data collected from the experiment relating to the variable, depression.

TABLE III

Means and Standard Deviations of Depression as
Measured by the DACL for Treatment and Non-Treatment
Groups

GROUP		3 day	17 day	90 day	Average
In Treatment	$\bar{x}$	42.93	46.69	45.46	45.02
	S_D	6.85	8.53	10.59	
	n	15	13	13	
Not In Treatment	$\bar{x}$	46.21	47.30	48.80	47.44
	S_D	7.45	8.34	11.06	
	n	14	10	10	

Table III above illustrates the lack of significant change in the means of depression across days and between treatment groups. The missing observations were greater for the non-treatment than for the treatment group. The means between the groups at each testing remain quite similar even though there are missing observations at the seventeenth and ninetieth days.

Table IV depicts all data collected from the experiment relating to the variable, denial.

TABLE IV

Means and Standard Deviations of Denial
as Measured by the Hackett-Cassem Denial Scale
for Treatment and Non-Treatment Groups

GROUP		3 day	17 day	90 day	Average
In Treatment	$\bar{x}$	8.66	6.923	6.346	7.31
	S_D	2.69	1.83	3.02	
	n	15	13	13	
Not in Treatment	$\bar{x}$	8.285	7.313	7.45	7.68
	S_D	2.86	1.87	2.15	
	n	14	8	10	

Table IV shows the similarity of means across days and between groups. The missing observations of five at the seventeenth day, and of four at the nintieth day for the non-treatment group do not seem to have affected the overall averages between the two groups. Again, the means at each testing are not significantly different.

Processing of the Data

The data was processed in the following manner: Depression Analysis Checklists (DACL): Each DACL protocol was hand scored by the researcher. The scores were then converted to standardized scores by means of a table provided in the manual. This was done to equate the totals since scales A and B have thirty-two responses and scale E, thirty-four. Protocol sets of less than three interviews were not analyzed. The data presented here is thus based on eleven Treatment and eight Non-treatment subjects who met this criterion.

Hackett-Cassem Denial Scale: Each Denial scale was hand-
scored by the researcher.   Since the nursing staff was not
available for most of the second interviews (seventeenth
day) and for all of the third interviews (ninetieth day),
only the questions that appeared consistantly in each in-
terview were used.   Eleven Treatment and six not-in-
treatment subjects were used due to missing data.

Hypothesis I: Denial and depression are inversely corre-
lated in patients who have sustained a myocardial infarc-
tion.

Using the raw data in the form of paired observa-
tions, the first hypothesis was tested:

H_o: ρ Depression x Denial < 0, t=3d, 17d, 90d
(where ρ is the Pearson Product Moment Co-
efficient, and the appropriate statistic is
the t-statistic: t_s)

Table V displays the results.

TABLE V

Display of the Correlation Coefficients
and the Related Tests of Significance

	t-3d	t-17d	t-90d
n	29	20	23
r	+0.26	+0.40	+0.36
t_s	$+1.37^{ns}$	$+1.85^{ns}$	$+1.77^{ns}$

Note that for any of the correlations to have been
significantly less than zero (α=5%), the corresponding
t-values would have necessarily had to have been less than
about -1.64.

The conclusion from the above information is that

depression x denial were not negatively correlated in the

sample studies at any time.

The first correlation coefficient depicting the

relationship between denial and depression is .26, the

t-statistic of 1.37 shows that this does not differ

significantly from zero. Figure 1 shows pictorially

the relationship between denial and depression at the

first interview. The data included are standardized scores

derived using the DACL manual.

Figure 1

44
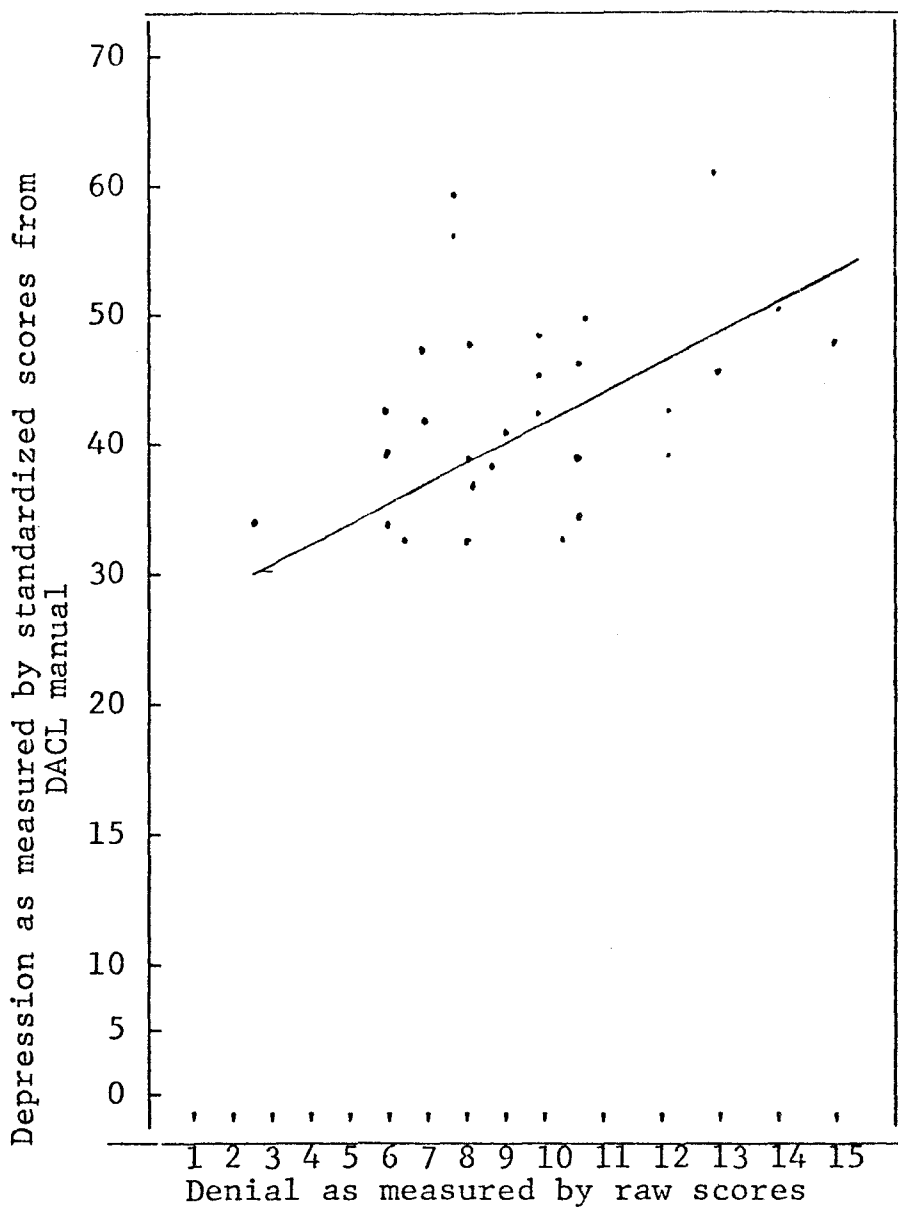
Fig. 1. Day Three: First Interview
         Correlation between levels of
         Denial and Depression, which
         includes all patient data.

Although a positive trend can be observed at day three, it was not statistically signicant at the .05 level.

Table V indicates that the second correlation co-efficient depicting the relationship between denial and depression is .40, the t-statistic of 1.85 shows that this is not significatnly different than zero. Figure 2 displays the scattergram of the relationship between the two variables at the second interview. The data plotted are standardized scores referenced from the DACL manual.

Figure 2
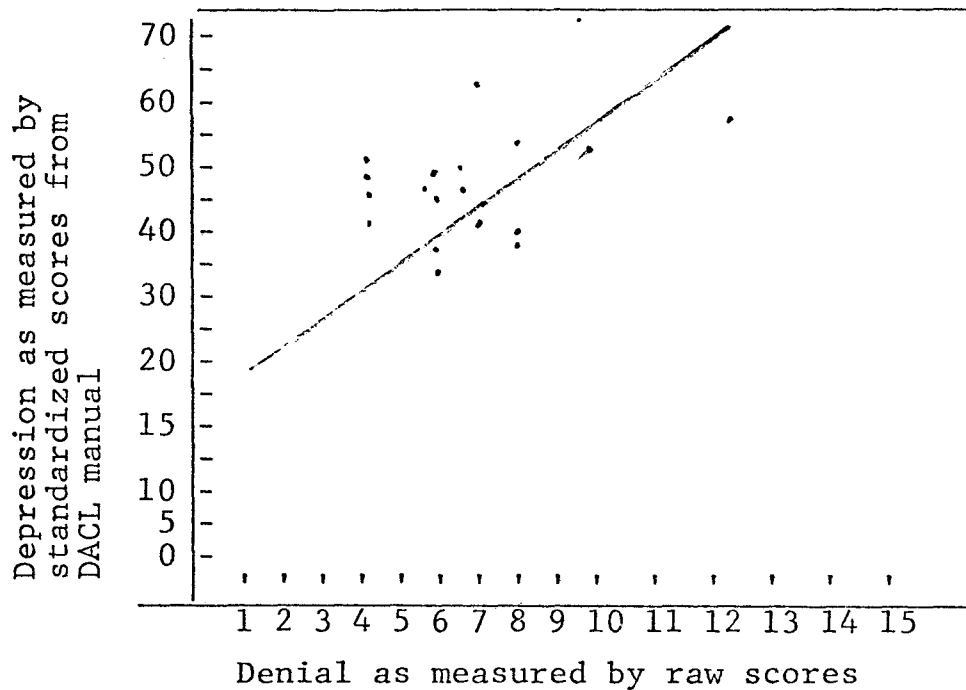
Fig. 2. Day Seventeen: Second Interview correlation between levels of Denial and Depression, which includes all patient data.

Thus, Figure 2 illustrates the significant positive correlation between denial and depression at an alpha level of .05.

Table V shows that the third correlation coefficient .36 and the t-statistic of 1.77 does not differ significantly from zero to show a negative trend. However, Figure 3 depicts the relationship between denial and depression as positive and significant at the .05 level.

Figure 3
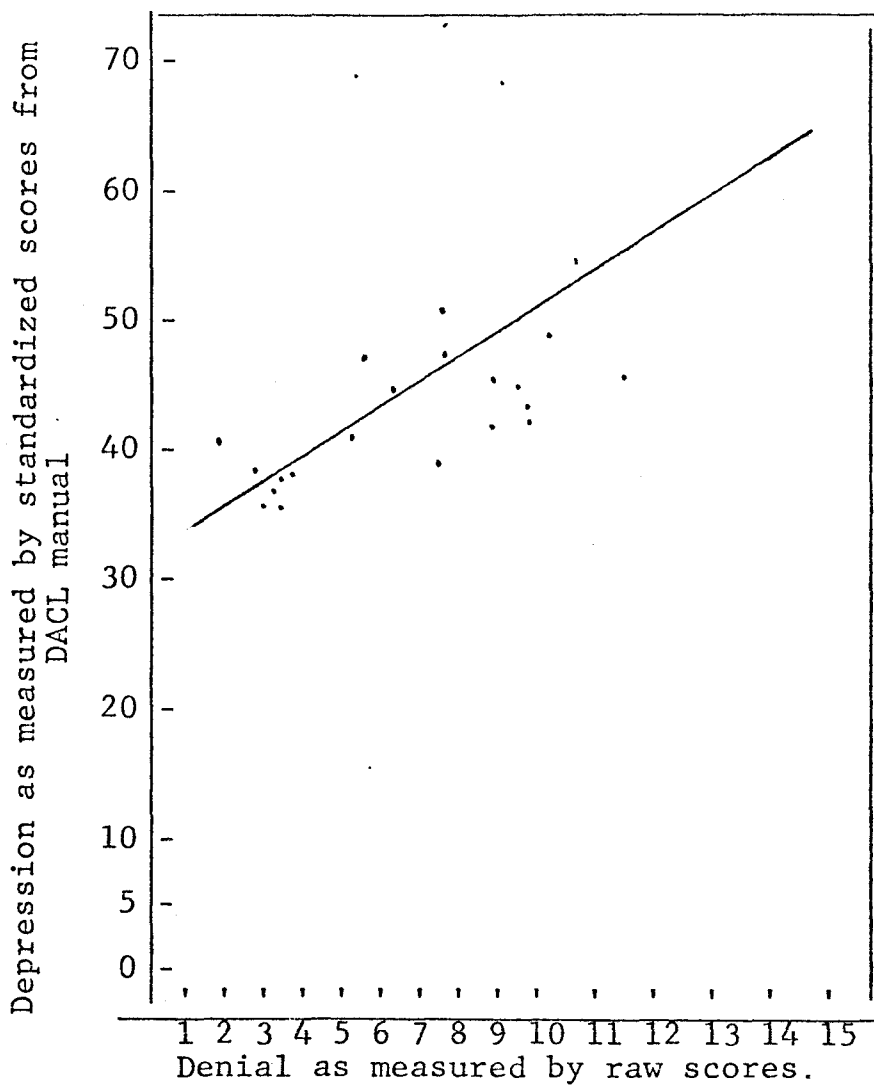
Figure 3. Day Ninety: Third Interview, Correlation between levels of Denial and Depression, which includes all patient data.

Hypothesis II: Post-infarct patients who go through an educating and counseling experience such as coronary rehabilitation classes, will have lower levels of both denial and depression.

A two-way split plot design was utilized due to a vacant block resultant from non-treatment control group at Lutheran General Hospital. Missing observations at the seventeenth and ninetieth days resulted in nineteen complete data sets, since there is no available statistical technique to handle this problem.

The treatment (T+) and Non-treatment (T-) groups were then compared to test the following hypotheses about Depression:

1. H_o: μ treatment = μ non-treatment

2. H_o: μ 3 day = μ 17 day = μ 90 day

3. H_o: μ T+x3 day = μ T+x17 day = μ T+x90 day =
    μ T-x3 day = μ T-x17 day = μ T-x90 day

The means on the DACL for treatment and non-treatment groups from patients with complete data sets are displayed in Table VI. It can be noted that these means from eleven treatment and eight non-treatment do not differ significantly from the data presented on Table III, utilizing all collected data. It can thus be surmised that the nineteen patients are representative of the original twenty-nine tested.

TABLE VI

Means and Standard Deviations of Depression
as measured by the
Depression Adjective Checklist (DACL)

Groups		3d	17d	90d	Avg.
Treatment	$\bar{x}$	41.8	45.18	45.82	44.26
	S_D	7.29	5.12	11.51	
	n	11	11	11	
Non-treatment	$\bar{x}$	44.38	44.75	50.87	46.67
	S_D	5.18	6.6	11.49	
	n	8	8	8	

The results derived from the analysis of variance are presented below. Only the nineteen complete interviews were utilized in computation.

TABLE VII

The Results from ANOVA On Depression

Source of Variation	SS	df	MS	F
A	23.42	1	23.42	0.24^{ns}
Subjects within Groups	1680.68	17	98.86	
B	95.76	2	47.88	0.89^{ns}
AB	19.84	2	9.92	0.18^{ns}
B x Subjects within Groups	1831.02	34	53.85	
Total	3650.72	56		

The results derived from the analysis of variance procedures indicated that there is no differential treatment effect over treatment between groups. Therefore the null hypothesis μ treatment = μ non-treatment cannot be rejected. The analysis cannot reject the hypothesis that there is a differential treatment effect over time as well as also concluding that the hypothesis of a treatment effect over time x treatment interactions cannot be rejected. All hypotheses were not significant at alpha levels well above .5. Since primary interaction effects for depression were

not significant, no purpose would have been served by check-
ing for quadratic trends or by doing multiple comparisons
a̶ la Dunn.

The means and standard deviations on the Denial Scale
for seventeen patients are presented below in Table VIII:

TABLE VIII

Means and Standard Deviations for Denial
as Measured by the Hackett-Cassem Denial Scale

Groups		3d	17d	90d	Avg.
Treatment	$\bar{x}$	8.55	6.82	6.0	7.12
	S_D	2.84	1.87	3.16	
	n	11	11	11	
Non-Treatment	$\bar{x}$	8.5	6.0	7.5	7.33
	S_D	3.94	3.93	2.51	
	n	6	6	6	

When these means are compared with the total patient
means on the denial scale, the difference is not significant.
Therefore it is possible to assume that the seventeen complete
sets are representative of the original twenty-nine subjects.

The treatment (T+) and non-treatment (T-) groups
were compared to test the following hypotheses about Denial:

1. H_O: μ t+ = μ t-

2. H_O: μ 3 day = μ 17 day = μ 90 day

and 3. H_O: μ t+x3 day = μ t+x17 day = μ t+x90 day =

μ t-x3 day = μ t=x17 day = μ t-x90 day

The results derived from the analysis of variance procedures are displayed below.

TABLE IX

The Results from the ANOVA on Denial

Source of Variation	SS	df	MS	F
A	1.40	1	1.40	0.11^{ns}
Subjects within Groups	189.93	15	12.66	
B	9.58	2	4.79	0.90^{ns}
AB	1.66	2	0.83	0.16^{ns}
B x Subjects within Group	159.27	30	5.31	
Total	361.84	50		

The results derived from analysis of variance procedures do not reject any of the three hypotheses concerning differential treatment effect between groups over treatment, over time, or in treatment x time interactions. Again, all hypotheses were not significant at alpha levels above .50.

In view of the obvious lack of significance, neither multiple comparisons nor trend analysis were performed. Kirk(1968) states that when the trend does not depart from linearity, Sheffe or Dunn's test cannot be used.

The unusually low F-statistics were caused by the large mean square error involved and may be explained by the possibility that the missing data may not have been missing randomly with respect to treatment response. Figure 4 illustrates this possiblity.

Figure 4

Differences Between Treatment and
Non-treatment Groups with Respect
to Rate of Interview Return
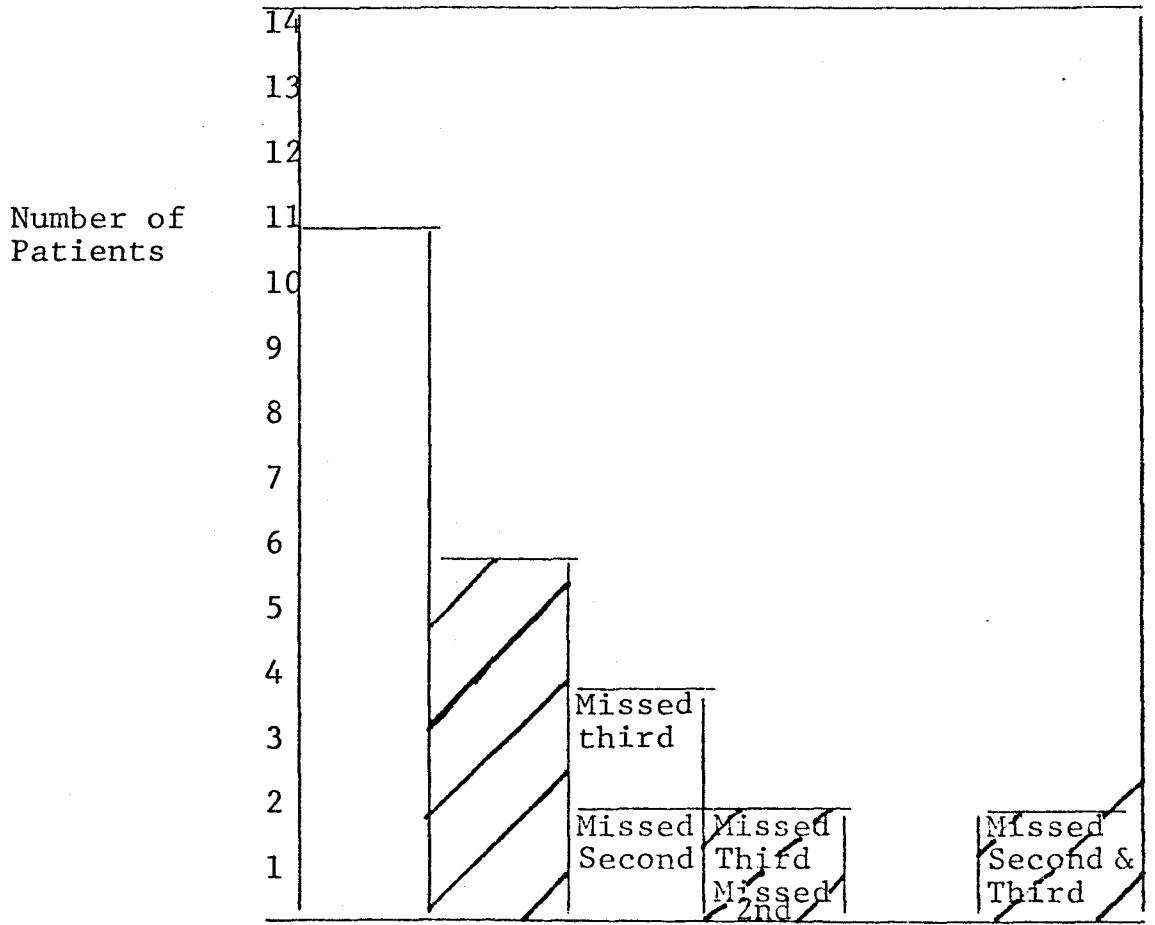
Three interviews   Two Interviews   One Interview

The bar graph (figure 4) compares the rate of inter-
view return by patients voluntarily. It is possible to
observe that those patients involved in the rehabilitation
classes did have a higher rate of return, and not one neg-
lected to return both the seventeenth and ninetieth-day
interviews. Hence, there may have been a missing data x
treatment interaction.

Although the differences between the means of the
treatment groups were not different statistically, it is
possible to view a direction of trend on each construct
over time. Figures 5 and 6 display this information.

Figure 5

Depression Means as scored by the DACL
at each interview

Depressions
as measured
by standardized
scores from
DACL Manual

50
49
48
47
46
45
44
43
42
41
40

3d   17d   90d

Time
. denotes Treatment ○ denotes Non-
Treatment
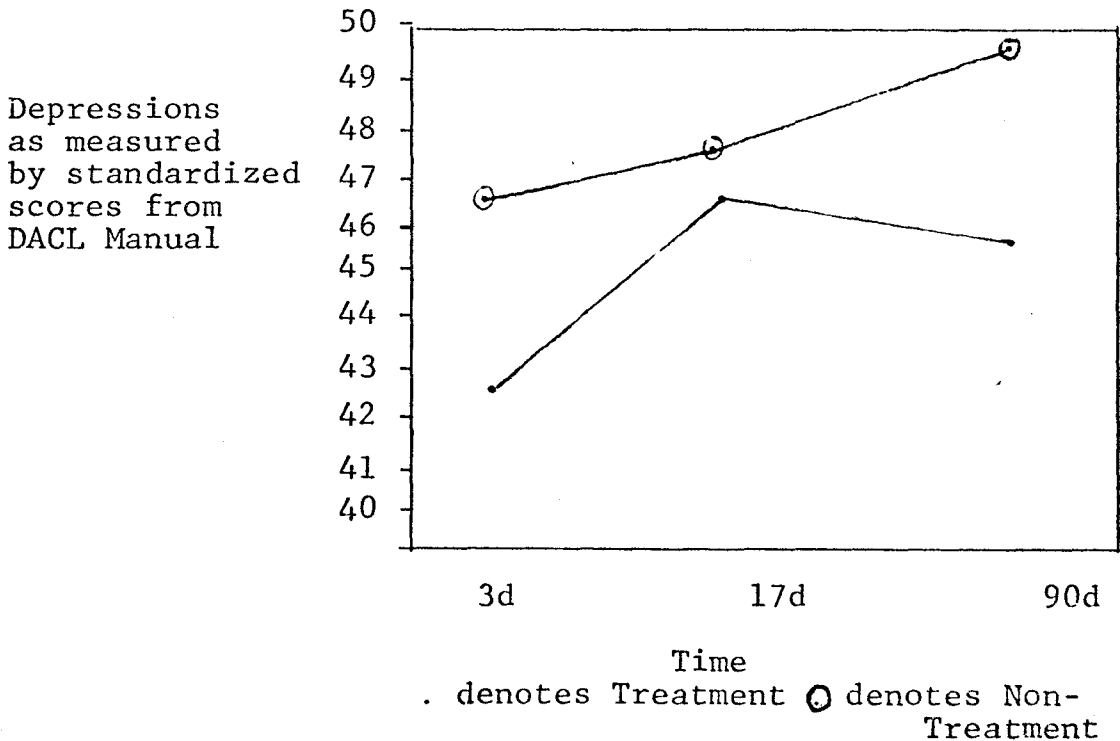
Figure 6

Denial Means as computed from raw
scores at each interview

Denial
as measured
by raw scores

. denotes Treatment   O denotes Non-
                                  treatment
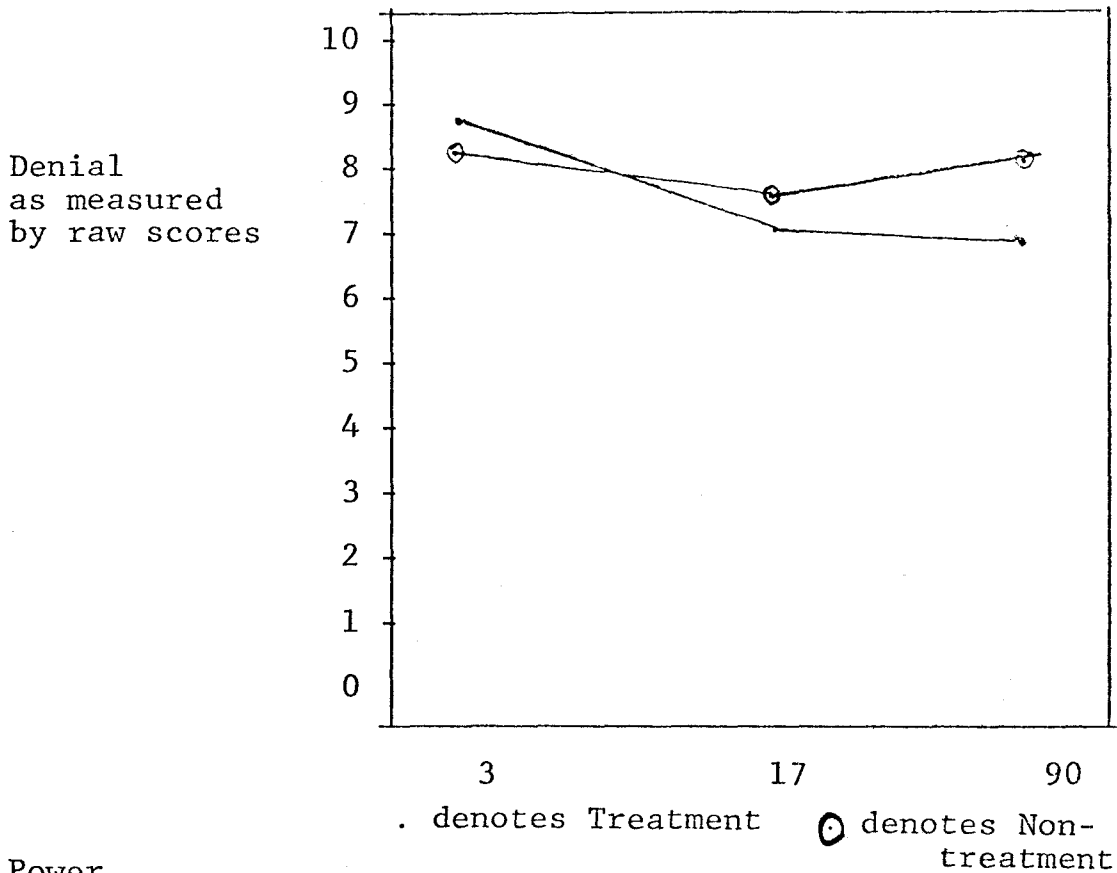
Power

Even though no significant difference between the

groups (treatment and non-treatment) was found, valuable

information may still be collected. Although the null hypo-

theses: post-infarct patients who go through rehabilitation

classes will have lower levels of both depression and denial

and there is a curvilinear relationship between depression

and time, were not proven to be true, credibility for the

null hypotheses may be found using the concept of power.

Using methods discussed in Kirk (Kirk, 1968) values of $\emptyset$

were calculated and Tang's power charts were referenced.
In order to reference these tables, it is necessary for
the experimenter to determine a minimum difference be-
tween the groups that would show practical evidence of
group differences. The resulting values of alpha, $\emptyset$,
and power are contained in Table X.

Table X

Power of the Test on the Main Effect
for Depression and Denial for Treatment
and Non-Treatment Groups

		Minimum Difference	$\emptyset$	Power
Depression	.05	10	3.03	.98
	.05	5	1.52	.50
Denial	.05	2.5	1.19	.78
	.05	2	3.56	.60

The powers of .98 and .50 at the .05 level respective-
ly for depression are sufficient to determine a departure
from the null hypothesis. The power for denial with a dif-
ference of 2.5 and 2.0 points   is   .78 and .60 respective-
ly. This also is sufficient power to determine departure
from the null hypothesis.

Conclusion

Thus, although the null hypotheses originally con-
ceived could not be rejected, some valuable information was
derived from the data. Namely, that denial and depression

can be positively correlated following a myocardial infarction, and that educative/psychotherapy classes, as they are presently designed, do not positively improve the patient's emotional response to his illness when measured on the variables of denial and depression.

The data have also revealed descriptive trends that have been previously verified in the literature review and depicted in Figures 5 and 6. However, no interpretive statement can be made since there was no statistically significant difference between the two groups.

DISCUSSION

The expectation that educative/psychotherapeutic rehabilitation classes would have an effect on the two emotional responses of denial and depression was not upheld. The treatment group showed no significant decrease in these variables when compared to the non-treatment group.

From this evidence, then, it can be inferred that, if patients not involved in the classes have close to the same levels of denial and depression as those who go through the group process, then the content and method of the classes themselves must come into question.

Although it was determined that the two treatment groups were not statistically significantly different, the possibility of medical significance exists. If the patients who attended the rehabilitation classes were found to have an improved lifestyle, increased longevity, and freedom from coronary symptoms, medical significance could be assumed. A long-term longitudinal study of patients who do and do not participate in coronary care classes is indicated to test for medical significance. At this point in the present study, evidence of medical significance has not been sub-

stantiated.

The courses in both hospitals were theoretically designed to meet both the educational and psychological needs of the patients. The content included the anatomy of the circulatory system and causes of myocardial infarction, nutrition and cholesterol, coping with stress and life-management following an MI, and supportive group interaction. The objective aspects of the course, as observed by the researcher, appeared comprehensive and the information was easily understood. The subject matter was presented both visually and orally and the subjects were encouraged to ask questions. At face value, it is difficult to criticize their methods in this aspect of the class. Since the study dealt with psychological variables, it is necessary to examine whether these needs were actually met. The staffs of both rehabilitation classes were registered nurses trained to teach the course. The St. Francis course also provided a psychologist, outside of classtime, to those patients who requested the service.

Although the opportunity exists for the group leaders to deal with group interaction, mutual support, and individual problem-sharing, perhaps the lack of training of the teaching staff in group facilitating skills and therapy prevents the expression of feelings and fears by the patients. It is possible that the presentation of the information about heart disease may prove stressful to the

"educated" patient when his immediate emotional response
is not perceived. In comparison, the lack of knowledge
of the "uneducated" patient dealing with his fears alone
is not significantly more stressful.

It is interesting to note that, by the third day of
hospitalization, most patients scored below the standard-
ized norms of a non-psychiatric population, although all
reported, in retrospect, extreme depression upon admittance
to the hospital. Since retrospective data is not consider-
ed statistically usable, these measures were discarded. It
could be surmised, then, that the patients may be entering
the course at the wrong period of their convalescence. The
concept of presenting the course while the subject has in-
patient status does provide a captive audience, but does
not change his emotional response. The literature supports
the assumption that there are personality correlates for
infarction patients, and that an adverse emotional reaction
to the infarction can inhibit recovery. Then, it could be
suggested that according to patient self-report, psycholog-
ical support services should be available shortly after
admittance, and the educative/psychotherapy classes should
include a psychologist at each session to deal with any
immediate problems that might arise.

The Pearson Product Moment test on correlations
revealed, surprisingly opposite to expected findings, that
when depression increased or decreased, so did denial in

the same direction. It was originally conceived that as
the patient accepted the fact that he has sustained a
myocardial infarction denial would be lessened. It was
hypothesized that once the patient realized that he had
endured a life-threat, that depression would ensue. While
collecting the data, the researcher was able to informally
discuss the occurrence of the MI. Although some patients
were subdued in recollection, all readily described the
event in exacting detail. This "reliving" of the exper-
ience verbally may have provided the patient the opportunity
to 1) come to grips with the situation by objectifying it,
and 2) measure his own progress against how he remembered
he felt when admitted to the hospital, and at the present
time. Since it was discovered that denial and depression
are positively correlated, the rehabilitation classes
should concentrate on the immediate confrontation of these
responses first, before dealing with the more content-
related aspects of the course. This would enable the
patient the opportunity to alleviate his stress and then
understand the etiology of his disease while planning for
the future.

While analyzing the data, certain problems in data-
collection were discovered. At the outset, it was very dif-
ficult to obtain permission to conduct this research.
Both physicians and nurses have a tendency to be protective
of their patients, and rightfully so. Therefore, the re-

sistance met resulted in a small sample of patients that fit the pre-established parameters required. Although the subjects in the sample were considered to be randomly selected, in fact they had the choice offered of completing and mailing the second and third interviews on their own, or not responding at all. This element of choice resulted in more patients from the treatment group (eleven) than from the non-treatment group (eight) responding voluntarily. The study should be repeated with more patients to increase the power of the tests and also in a more structured fashion to eliminate the possibility of a treatment x missing data interaction.

The information derived from this study encourages related research in this area.

Since the patients who were mailed interviews had a choice of whether to return them or not, perhaps those who did respond displayed a greater interest in and/or acceptance of their illness. A study could be performed which would distinguish between those patients in treatment and those who were not and the respective rates of independent responses. If it would evidence that patients involved in in-patient groups have a continuing interest after discharge, it could possibly be inferred that there is a need for the coronary classes to be continued on a voluntary basis after discharge. The coronary care unit, and later placement on a medical floor in the hospital, creates a secure and protective environment for the MI

patient. Upon returning home he must again face stressful situations and decisions. This could be extremely threatening for the patient ill-equipped to meet these challenges.

Another area where further research is indicated is to compare Kubler-Ross' stages of mourning (denial, anger, depression, acceptance) with the similar progressive stages of emotional response which the MI patient experiences. The rehabilitation groups could respond to this trend, if discovered, by organizing the classes to correspond to these transitional stages.

In summary, the educative/psychotherapeutic groups studied in this research had no apparent influence on decreasing levels of denial and depression in the myocardial infarction patient. It could be concluded, then, that the method of instruction, content of the course, and training of the nurse-facilitators must be questioned. Also, since denial and depression appear to be positively correlated, the staff of the rehabilitation classes must be responsive to these simultaneous reactions. Presently, before any more time is unproductively spent by patients involved in these rehabilitation groups, the groups themselves should be redesigned to more fully meet the patient's psycho/emotional needs.

SUMMARY

The purpose of the investigation was to ascertain whether educative/psychotherapeutic rehabilitation groups conducted in local hospitals the week following myocardial infarction (MI) decreased levels of denial and depression. The literature has indicated that both denial and depression inhibit, and possibly prevent, successful recovery in the post-infarct patient and it was hypothesized that the in-hospital rehabilitation classes would reduce levels of these psychological variables by educating the patients. The research was conducted at two hospitals utilizing twenty-nine male patients between the ages of forty-four and seventy-three years who had sustained certified Myocardial Infarctions. The patients were randomly divided into treatment (in rehabilitation class, n=15) and non-treatment (those not assigned in rehabilitation class, n=14) groups. The educative/psychotherapeutic classes at both hospitals were systematically observed utilizing the DACL...and noted to stress the same aspects of rehabilitation for the patients. The patients were observed via interviews consisting of a questionnaire, depression checklist, and denial scale. The interviews took place in person on the third and seventeenth

teenth days of hospitalization, and ninety days later via
mail. Pearson Product Moment correlation coefficients in-
dicated that denial and depression were positively corre-
lated in both groups. A two-way split plot over treatment
and time, collapsing on the variable hospital, was utilized
to test treatment effect of educative/psychotherapy groups.
Results indicated that the treatment had no demonstrable
influence on either psychological variable. These findings
could be used to evaluate some aspects of the treatment
programs' effectiveness and to consider the meaningfulness
of two constructs commonly held to be important in rehabili-
tation after myocardial infarction: denial and depression.

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APPENDIX A

Informed Consent Form

I, the undersigned, will participate in Mrs. Whitehead's
study concerning rehabilitation for patients who have
sustained a heart attack. I understand that I will be
involved in three interviews concerning my feelings about
my experience and how I feel at that moment. I permit her
to use the information derived from the interviews and
subsequent tests in her research. I have been informed
that my identity will remain anonymous.

Signature:_____

Date:_____

Dear Doctor,

    Will you please give permission for your patient:
_____ to participate in Mrs. Whitehead's
study concerning patients who have sustained an acute
myocardial infarction? The project consists of three
interviews (the first on the third day of hospitalization
after the MI has been documented, the second on the seven-
teenth day, and the third by mail ninety days after admis-
sion) which are brief and non-stressful to the patient.
The study is concerned with the psychological variables
of depression and denial following the MI, and the effect
of the in-hospital coronary classes on these variables.
The patient's identity will remain anonymous.

    Thank you.

          YES_____   NO_____

Signature:_____

Date:_____

NAME:

ADDRESS:

Birthdate:_____   Age:_____

Marital Status:_____

Children: (number and ages)_____

Grandchildren:_____

Parents: Alive_____   Deceased_____
          If deceased, cause of death_____
          Age at death_____

Education: High School graduate_____
            College graduate_____
            Some graduate level courses_____
            Masters degree_____
            Doctorate_____
            Other_____

Type of business or profession:_____
          Years at present job_____
          Hours/week at job_____
          Most recent promotion_____
          Satisfaction with present job situation_____

          Characterize usual business day choosing from
          these terms: enjoyable, smoothe, hectic, tense,
          easy, hard, busy, quiet, confusing, organized,
          too long, too short, (add some not included if
          desired_____
          _____

          Own business_____
          Actively seeking new position_____

Activities:
          Vacation weeks/year:_____
          Type of vacation:_____
          Active sports participation: golf___Raquet-
          ball___Tennis_____Handball_____Swimming_____
          Other_____
          Number of times/week_____
          Other types of activities: i.e. gardening,
          housework,_____

Favorite form of recreation:_____
Sedentary hobbies:_____
Hours of TV watching/day:_____

Health:

Heart trouble diagnosed as_____
Age at which discovered_____
Presenting complaints_____

Physician's recommendations_____
_____
Prescriptions_____
Dosage/day_____
Hospitalization_____Duration_____
Cause for Hospitalization_____
_____
See physician_____times/year
Involved in psychotherapy: presently, previously
Duration of therapy_____
Smoking:_____packs/day_____
Quit, but smoked_____years_____packs/day

Future Plans:
Retirement: presently___ Cause of retirement___
Age at retirement___ Plan to retire_____
(If retired, please fill in business questions
as they applied in the past)
Personal goals_____
_____

Additional comments:

Please circle the correct response.

Name_____

1. Was there any delay in consulting for help after onset
    of symptoms?
    a. 0-1 hour
    b. 1-5 hour
    c. 5-24 hour
    d. 24 hours or more

2. Did others help you decide medical care was needed?
    a. No
    b. Maybe
    c. Definitely

3. How do you feel today? Are any symptoms present?
    a. No
    b. Maybe
    c. Definitely

4. Was your doctor too strict in the hospital?
    a. No
    b. Maybe
    c. Definitely

5. After the onset of your symptoms, were you at any time
    scared of: (check response)

	YES	NO
Death	___	___
Another Heart attack	___	___
Invalidism	___	___
Monitor Alarm going off	___	___
Irregularities on monitor	___	___
At the peak of symptoms	___	___

Dear Mr.

      Remember that nice young lady who asked you all of those questions while you were recovering in the hospital? I am back again with the continuation of your interview. Please fill out the enclosed forms and mail them back to me in the stamped and addressed envelopes. This is very important to me, as you are an essential individual in my study.

      If you have any questions, please phone me at: 432-6788. Please do this today. I need your help.

      Thank you.

                  Very truly yours,

                  Lynn Dee Whitehead
                  1477 Avignon Ct.
                  Highland Park, Illinois 60035

APPENDIX B

Cardiac Rehabilitation Classes

Objective	Course Content	Activities
To understand how the normal heart works	I. Anatomy and Physiology of the heart. A. Structure of heart 1. Four chambers	Name them using heart diagram.
	2. Location of heart	Have pt. place his hand over his heart.
	3. Size of heart	Compare size to the size of a man's closed Fist.
	B. Circulation of blood through the heart. 1. Deoxygenated blood returning from the head and arms return to the rt. atrium through the superior vena cava, deoxygenated blood from the trunk and legs return to the rt. atrium through the inferior vena cava ----from the rt. atrium through the tricuspid valve into the rt. ventricle; from here the blood goes through the pulmonary artery and then separates into the lt. and rt. arteries and then enters the lungs where it replaces CO_2 with O_2. This oxygenated blood returns to the heart via the pulmonary veins which lead into the lt. atrium and through the mitral valve into	Trace a drop of blood through the heart and lungs.

Objective   Course Content   Activities

the lt. ventricle.
The lt. ventricle
pumps the oxygen-
ated blood into the
body via the aorta.
The 1st branches of
the aorta are the
coronary arteries
which supply the
heart with the nec-
essary blood supply
which enables the
heart to pump.

C. Conduction system   Briefly mention
of Heart. Suffice   that Potassium
to say the heart is is necessary to
able to pump because maintain this
it has its own elec- system.
trical system.

To define what a   II. Definition of a Heart
heart attack is   Attack
and its causes.   A. A sudden interrup- Draw a picture of
To explain what   tion of blood flow a coronary art-
happens to the   through the coron- ery and what hap-
heart after a   ary arteries which pens with an MI.
heart attack   results in the
occurs.   death of the tissue.
                1. Other terms which
                   mean the same as
                   heart attack.
                   a. Coronary Em-
                      bolism
                   b. Coronary Oc-
                      clusion
                   c. Myocardial
                      Infarction MI
                   d. Coronary
              B. Causes of a Heart
                Attack
                1. Embolism in a cor-
                   onary artery
                   a. Definition: a
                      mass of undis-
                      solved matter,
                      may be a com-
                      plication of
                      arteriosclerosis,
                      usually a blood clot.

2. Arteriosclerotic
   Heart Disease
   a. Definition:
      Thickening,
      hardening, and
      loss of elas-
      ticity of the
      coronary art-
      eries which re-
      sults in altered
      function of the
      heart. It is a
      normal part of
      aging.
3. Prolonged constric-
   tion of the coron-
   ary arteries
   a. May be caused by
      excessive smok-
      ing, or high
      stress situations.

III. What happens to the heart
     after a heart attack.
   A. Blockage of one of the
      coronary arteries by
      one of the above causes
      leads to death of the
      tissue. Once this has
      happened, the heart
      attempts to bring a new
      blood supply to the dead
      area by developing what
      is known as collateral
      circulation (a system
      of blood vessels paral-
      leling the coronary art-
      eries which maintain the
      supply of blood to the
      affected area. At the
      same, time white blood
      cells move into the
      damaged area of heart
      muscle and set the stage
      for healing.
   B. Factors which will affect
      the length of time needed
      for recuperation.
      1. Size of the damaged
         area.
      2. The effectiveness of
         the collateral circulation.

         3. The individual per-
          son's own rate of
          healing.

       C. It takes approximately
         6 weeks before the
         damaged area in the
         heart has healed com-
         pletely and scar tissue
         has formed.
       D. Differences between the Refer to
         symptoms of a heart   visual chart
         attack and anginal pec- comparing
         toris pain.   the two.

     IV. Risk Factors associated
      with Heart Attacks.
      A. Heart Disease-Leader
To discuss the   in the cause of health
various risk fac-   problems--over 670,000
tors associated   deaths caused by heart
with heart attacks.   attacks each year.
      B. Predisposing Factors
       1. Factors which cannot
        be controlled
        a. Heredity--incid-
         ence of heart
         disease already
         in the family.
        b. Sex--more males
         are prone to
         heart attacks
         than women; how-
         ever, this is
         rapidly changing
         due to the new
         roles of women.
         Women also seem
         to be "immune" to
         heart attacks pre-
         vious to menopause
         but after this
         time the incidence
         between men and
         women are almost
         equal.
       2. Factors which can be
        controlled

Objective	Course Content	Activities
	a. Obesity-with increased pounds, the heart has an increased workload to supply this area with necessary O_2 and nutrients.	Ask pts. how many pounds they have to lose to be at an average weight
	b. Arteriosclerosis-although this is a normal part of aging, high levels of cholesterol will lead to more deposits.	Ask pts. to give examples of foods high in cholesterol.
	c. High blood pressure-prolonged constriction of the arteries will increase the risk of attack.	
	d. Smoking-leads to prolonged constriction of the coronary arteries.	Ask how many people smoked prior to their admission. Death rates range from 50-200% higher among cigarette smokers than among non-smokers.
	e. Lack of excercist-studies show that men who lead sedentary lives run a higher risk of heart attack than those who get regular exercise. Exercise tones the muscles, stimulates the circulation, and helps to avoid overweight.	
	f. Diabetes-the body does not	

produce enough
insulin to turn
sugar and starch
into energy. As
a result, excess
sugar builds up
in the blood.
This is associ-
ated with a rise
in cholesterol
and other fats
in the blood,
and with the de-
velopment of
arteriosclerosis.

g. Stress-leads to   Talk with pts.
constriction of   concerning what
the coronary   makes them anx-
arteries.   ious. What types
of jobs do these
V. Rehabilitation after   people have.
a heart attack
A. Definition of Re-
habilitation

To discuss the   1. Gradual return   Have pt. look
importance of   to activities of   at activity
exercise after   daily living.   booklet made up
a heart attack   2. Represents stage   by St.Francis
and to give ex-   of recovery.
amples of appro-   B. Stress the fact that
priate types of   each person is an
activity   individual and that
he should ask his
physician when the
best time is to re-
turn to full func-
tion.
C. Institute of program
of increased exercise
and activity for long-
term rehabilitation.
1. Begin physical con-
ditioning with a
gradual increase of
activity levels.
This has been started
in the hospital prior
to discharge.
2. Plan a daily program
of exercise that will

Objective	Course Content	Activities
	become a perman-ent part of your life.	

3. Types of activities which are acceptable for a heart pt.

   a. Pt. may carry out self-care and routine daily activities in the house, including climbing a few stairs and light housework.

   b. Walking should be encouraged so that at the end of the second week at home, the pt. can walk comfortably one mile a day.

   c. Quiet activities are suggested dur-ing the first weeks at home. These in-clude:
     1. Card playing
     2. Games
     3. Hobbies, recrea-tions

       Ask previ-ous MI pts. what acti-vities they did when they first got home.

   d. Sexual activities may be resumed with the consent of your doctor usually with-in three weeks of your discharge from the hospital.

   e. Driving the car is also up to the dis-cretion of your doc-tor. Usually, driv-ing privileges are restored within one month of discharge.

       Ask pts. why driving might be hazardous to them.

   f. Importance of not tiring yourself out --May be managed by daily naps, taking six small meals in-stead of the usual three, appropriate

activities,
avoiding stress-
ful situations,
becoming aware
of what makes
you tired and/
or uncomfortable.
g. Avoid the follow-
   ing:
   1. Strenuous act-
      ivity such as
      heavy lifting
      and pulling
   2. Heavy meals
   3. Emotional
      stresses
h. Return to work--
   This will depend   Ask pts.
   on the type of   what type
   job you have. Pt.   of jobs they
   may return to the   have and how
   job on his doctor's   they will
   advice. Suggest   adjust to
   that the pt. start   their limit-
   by working shorten-   ed activity.
   ed hours and in-
   creasing these
   hours as tolerated.

D. Briefly discuss the type
   of activity in CCU and
   why this was instituted.
   1. The pt. in CCU is al-
      lowed minimal activi-
      ty in order for opti-
      mum healing conditions
      to take place. The pur-
      pose of minimal acti-
      vity is to decrease
      the workload of the
      heart and allow the
      collateral circula-
      tion to revitalize
      the damaged area.
      a. Bedrest
      b. Cutting up of food.
      c. Use of O_2 after meals.
      d. Range of motion exer-
         cises-passive exer-
         cises to extremities.

     e. Pulling pt. up
       in bed
     f. Use of bedpan
     g. No reading mater-
       ials, initially
     h. Restricted visit-
       ors.

E. Briefly discuss the
  type of activity on 3M
  and why this was in-
  stituted.
  1. The pt. on 3M is grad-
    ually allowed increases
    in activity depending
    on the existence of com-
    plications such as pain,
    an increase in the number
    of irregular beats, and
    water retention.
  2. Usual progression of
    activity:
    a. dangle-sitting at the
      side of the bed
    b. up in chair 2 or 3
      times a day as toler-
      ated, may also use
      commode at this time
    c. Up to the Bathroom
    d. Up in the Room and
      BRP
    e. Up and about

APPROVAL SHEET

The dissertation submitted by Lynn Dee Feldman Whitehead
has been read and approved by the following committee:

> Dr. Joy J. Rogers, Director
> Associate Professor, Educational Psychology, Loyola
>
> Dr. Jack Kavanagh
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The final copies have been examined by the director of the
dissertation and signature which appears below verifies
the fact that any necessary changes have been incorporated
and that the dissertation is now given final approval by
the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfill-
ment of the requirements for the degree of Doctor of
Philosophy.

May 22, 1978
Date

Joy Rogers
Director's Signature