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Hardiness as a predictor of postoperative behavior: A study of patients who have undergone a Total Hip Replacement

Flanagan, Leo F., Jr., Ph.D.

City University of New York, 1989

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300 N. Zeeb Rd.
Ann Arbor, MI 48106

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HARDINESS AS A PREDICTOR OF POST-OPERATIVE BEHAVIOR

A Study of Patients
Who Have Undergone A Total Hip Replacement

by

Leo F. Flanagan, Jr.

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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11 April 1989
Date

Suzanne Ouellette
Chair of Examining Committee

April 25, 1989
Date

Herbert D. Saltzstein
Executive Officer

Professor Suzanne Ouellette-Kobasa

Professor Morton Bard

Professor Howard Ehrlichman
Supervisory Committee

The City University of New York

This dissertation is dedicated to the memory of my father, Leo F. Flanagan, Sr. (1918 - 1988).

Dad found his commitment, his sense of control, and the ability to face the many challenges in his life through his faith. Of all the things he gave to me, my faith is the most important. His devotion included a promise to share his faith through a simple prayer. In Dad's memory and gratefulness for our faith, I share that prayer here:

"Most holy Apostle, St. Jude, faithful servant and friend of Jesus the name of the traitor who delivered thy beloved Master into the hands of His enemies has caused thee to be forgotten by many, but the Church honors and invokes thee universally, as the patron of hopeless cases, of things despaired of. Pray for me who am so miserable; make use I implore thee, of that particular privilege accorded to thee, to bring visible and speedy help where help is almost despaired of. Come to my assistance in this great need that I may receive the consolations and the help of heaven in all my necessities, tribulations and sufferings, particularly (here make your request) and that I may bless God with thee and all the elect forever. I promise thee, O blessed St. Jude, to be ever mindful of this great favor, and I will never cease to honor thee as my special and powerful patron and to do all in my power to encourage devotion to thee, Amen."

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CHAPTER ONE

INTRODUCTION

Since the mid-1960's we have witnessed an astronomical rise in the costs of healthcare. In 1983 these costs were rising at an annual rate of 12.6 percent, amounting to more than $322 billion, and accounting for over 11% of our gross national product, (Shaffer, 1984). In an effort to control and reduce these costs the Social Security Amendments of 1983 were enacted, establishing the Prospective Payment System (PPS) for hospital reimbursement under Medicare. States and private insurance carriers quickly adopted the PPS for their Medicaid and third party, hospitalization insurance, reimbursement plans.

Based on this system, the patient and his/her insurance carrier will be charged according to the average treatment costs for patients with a similar illness. The economic implications for hospitals and private practitioners are great. A patient who recovers faster than average will realize a profit for the provider, while a patient who recovers slower than average will result in a loss for the provider.

In instituting the PPS approach, government officials have predicted that the built-in incentive for improved efficiency would lead to stricter controls, innovation, improved quality, and ultimately better, more affordable healthcare for the consumer. In line with

this prediction, both healthcare institutions and private practitioners have scrambled to find new ways to satisfy and attract patients, shorten hospital stays, eliminate unnecessary treatment, ensure quality care, improve the efficiency of services provided and develop new marketing strategies. The focus has clearly been on changing the medical management of the patient and developing a competitive edge. A major goal of such efforts by hospitals has been to discharge each patient after a shorter hospitalization (length of stay or LOS) than the average calculated under the PPS. This results in the hospital realizing a net profit for the care of the patient.

The impact of the PPS and the radically changing healthcare environment on patients and their behavior has yet to be addressed. These changes may increase some of the multitude of economic, health, and psychological costs to patients and caregivers, inherent in the traditional healthcare system. By far the greatest of all these costs is patient noncompliance with prescribed treatment. Reviews of the literature estimate that from one-third to more than one-half of all those receiving medical treatment are not compliant with the treatment protocol (Marston, 1970; Friedman and DiMatteo, 1979). One potential effect of increasingly shorter hospitalizations on patient behavior is decreased

compliance with prescribed treatment.

Traditionally patients have taken a "passive dependent" role in relation to their medical caregivers (Starr, 1982). As will be discussed, this role may contribute to the high incidence of patient noncompliance. Hospitalization provides close medical supervision and some degree of control over the patient's compliance with prescribed treatment (e.g. medication, rest, and exercise). Therefore, shorter hospitalizations, coupled with a dependent patient role, may lead to poorer patient compliance with treatment. Given the shortening of hospital stays and an emphasis on ambulatory and home healthcare, patients may need to assume a more active stance if they are to fully benefit from treatment and if providers are to realize cost savings.

I propose that the problem of patients not fully utilizing and benefiting from medical treatment may not be best defined as one of their not "complying" with caregivers. Rather, we might look at the degree to which patients are actively engaged in their own healthcare. Specifically, this study tests the hypothesis that patients who are "hardy" or naturally active in difficult situations, will, when given the opportunity to participate in their care, recover faster and with fewer complications, as compared to patients who are less hardy. If hardy or active patients experience a speedier,

less complicated recovery, interventions aimed at changing the roles of patients and healthcare providers in support of hardy or active patient behavior should be developed. Such interventions would reduce the complicating health and economic costs arising from an inappropriate patient/provider relationship (i.e. where the patient is dependent).

Typical studies of patient involvement in medical treatment seek only to define and/or understand behavior categorized as "inappropriate" from the perspective of caregivers (i.e. noncompliance). This study makes an important contribution to the theoretical and practical understanding of positive patient behavior. I define positive patient behavior as that which increases the patient's involvement/engagement in his/her treatment and leads to fuller, and perhaps faster, recovery. Exploring patients' engagement as decision-makers in the treatment partnership is an important departure from investigating why they do not follow prescribed regimens.

This study's approach should be seen from a systems perspective. It is essential to understand how all factors contribute to patient behavior, rather than trying to demonstrate which group of factors has the greatest influence. While this study examines the role of the patient's personality style in relation to patient behavior and the effectiveness and efficiency of

healthcare, this is only the first step in understanding these issues. Future works will have to address differences in treatments, diseases, interpersonal relationships, environmental factors, and the role of the caregiver's personality style. To place my investigation in the context of a systems approach, I will review research on interpersonal relationships in healthcare in addition to research attempting to correlate individual differences with patient behavior.

BACKGROUND

The Patient/Caregiver Relationship and Roles In Medical Care

This study assumes that as a result of the major changes in healthcare, patients will be required to take a more active role in order to obtain maximum benefit from the treatment they receive. Patients' active participation in their healthcare is in conflict with the traditional patient or "sick" role.

The classic conception of the "sick role" (Talcott Parsons, 1951) holds that when people are defined as "ill" society temporarily exempts them from some or all of their usual responsibilities according to the severity of the illness. Further, sick individuals are seen as persons, no longer self-sufficient, who must be cared for by society. In exchange for being excused from their responsibilities and being cared for by others, sick people are obligated to do everything possible to get

well. This includes placing themselves under medical care, and cooperating with the caregivers.

Other models of the sick role and the patient/caregiver relationship have also been developed (e.g. the "Activity-Passivity", "Guidance-Cooperation", and "Mutual-Participation" models, Szasz and Hollender, 1956). Which particular model best describes a given case depends upon the degree to which the physician invokes his/her authority, and to a lesser extent the degree to which the patient accepts this authority. The major theoretical models of the patient/caregiver relationship have all focused on the specific relationship between the patient and physician, neglecting the role of other members of the healthcare system. The underlying assumption is that other caregivers model their behavior towards the patient after the physician's. Their authority is based upon power bestowed upon them by the physican.

In all of the major models, the physician is in a position of power and authority, while the patient assumes a passive/dependent role (Barondess, 1983; Starr, 1982). The patient's dependence is based on the physician's knowledge, competence, and ability to control the patient's behavior through various gatekeeping functions (Starr,1982). These gatekeeping functions include certifying that individuals are healthy or ill enough to be entitled to a host of services and

privileges (e.g., to enter the hospital, enter school, immigrate, qualify for disability compensation, collect Social Security Insurance, adopt a child, receive prescription drugs, qualify for income tax deductions, receive treatment from allied health professionals). Perhaps the most important of these gatekeeping functions is the authority to define care provided by, and control the patient's access to, allied health professionals (e.g. nurses, physical therapists, social workers). It is because of these abilities that the relationship of all healthcare providers to the patient is modeled after the physician/patient relationship.

One result of the power imbalance typically found in patient/caregiver relationships is that communication is largely one-way (Stiles, 1978). Caregivers communicate their requests and demands freely, while the patient's communication is usually focused on responding to queries posed by the caregiver.

Passivity and dependency on the part of the patient is so accepted that from the hospital staff's view the "ideal patient would be an inanimate object" (Goffman, 1961). In order to treat patients as objects caregivers depersonalize them by totally subjecting patients to the authority of the caregivers and the institution (Taylor, 1979).

The authority of the physician (and consequently all

caregivers) rests on expert and coercive power. When these sources of power reside predominantly in one role in a relationship they generate conflict. In the patient/caregiver relationship, the caregiver's excercising of expert and/or coercive power decreases the patient's sense of control. The patient often responds by actively or passively trying to take back control of the situation from the caregiver (Rodin & Janis, 1979). From the caregiver's perspective passive patients do what they are told, and are calm and cooperative. These patients may in fact be torn between the need for information and control, and the need to behave or cooperate. As a result patients may become passive to the point where they withhold information, and fail to follow simple treatment protocols (e.g. deep breathing exercises, walking, sitting-up, restricting food and fluid intake postoperatively). Subsequently they may be unable to make sound decisions, entering a state of "learned helplessness" (Seligman, 1975), with corresponding depression. They may also deplete their physiological reserves as a result of perceiving a constant state of threat.

Patients who actively attempt to gain control of the situation are seen by staff as being uncooperative, suspicious, and demanding more attention then their physical disease warrants. The active patient may engage in acts of mutiny (e.g. refusing medication, food,

or direction), and/or be in a constant state of physiological arousal (due to the conflictual relationships with staff). The latter may result in aggravating conditions such as hypertension. Caregivers often respond to the active patient by simply ignoring them, administering higher doses of medication to make them easier to "manage", and/or prematurely discharging them (Taylor, 1979).

From this discussion we can see that the current definition of patient compliance may not helpful in increasing our understanding of patient behavior. A patient is defined as compliant based on whether or not he/she: takes the medication; engages in the exercises; or follows the diet prescribed. As discussed above, a patient could be complying with a prescribed regimen as a result of a number of different motivating factors and interpersonal dynamics.

We can also appreciate that, regardless of an individual patient's or caregiver's personality style, there are tremendous influences within the healthcare system which encourage patients and caregivers to exhibit a particular set of behaviors. Therefore, though this study focuses on the patient's personality style to begin understanding his/her behavior, we must be mindful of the other factors present in the system.

The Costs and Benefits Associated With The

Patient/Caregiver Relationship

Much research indicates that the traditional patient/caregiver roles contribute to negative relationships which increase a multitude of economic, health, and psychological costs to patients, caregivers, and the healthcare system. For the patient these costs can be incurred even before seeking treatment for a complaint. For instance, a negative relationship with the physician significantly increases the likelihood that patients will delay seeking treatment after the first warning sign of cancer (Freidenberg, et al, 1980-81).

The costs of a negative patient/caregiver relationship increase as treatment progresses. Poor communication interferes with the physician's ability to make accurate diagnoses and assessments of patients' response to treatment (Merkel, 1984; Dirks, Schrea, & Robinson, 1982). Negative consequences ensue when the surgeon or anesthesiologist does not fully discuss the surgical procedure and postoperative experience with the patient, preoperatively. These consequences include poorer postoperative ambulation, significantly higher use of analgesics and narcotics, and longer hospital stays, by as many as seven days (Egbert, et al, 1964; Taylor, 1979). Negative effects continue to accrue up to and following discharge. Even pre-discharge programs designed to train patients in homecare skills do not reliably establish good patient/caregiver communication

(McPhee, et al, 1983). Many patients leave the hospital unclear as to how to care for themselves. This increases the risk of prolonged recovery, secondary diseases, and readmission.

The greatest economic cost to caregivers is the tremendous rise in malpractice suits. Many lawsuits stem from poor relationships where the physician is insecure with and fearful of anger from patients (Blum,1957; 1960; DiMatteo, 1979) or where the patient perceives that physicians are not concerned with his/her problems (Mechanic, 1966).

Patients' search for a positive patient/caregiver relationship or "doctor-shopping" may be costly to both parties. One study found that 48% of upper- and 37% of lower-income families had changed physicians within the past year. "Doctor-shopping" was related to a lack of confidence in the physician, doctors' unwillingness to talk with patients, hostile feelings toward the physician, and the physician's personal qualities (Kasteler, et al, 1976).

For both patients and caregivers the greatest of all costs associated with a poor relationship is patient noncompliance with prescribed treatment. It is estimated that from one-third to more than one-half of all those receiving medical treatment are not compliant with the treatment protocol (Marston, 1970; Friedman and

DiMatteo, 1979). Noncompliance prolongs recovery, increases the risk of complications, increases economic costs, interferes with the ability to diagnose and treat, and increases the number of patients in the healthcare system.

In sum, the traditional relationships in healthcare influence both physician and patient behaviors so that significant costs are incurred by all members of the system. In turn these costs become part of a cyclical process influencing the personality style, perception, behavior, and relationships of all the participants. The costs of the traditional relationship encourage us to find a more beneficial way for patients and caregivers to interact. Again, in looking at patient personality style in order to understand how we might decrease one of the highest costs, "noncompliance", we do so with an understanding that it is only one of the contributing factors.

Compliance

A number of factors (e.g. patient demographic characteristics, personality traits, type of illness, complexity of treatment, situation) have been studied in relation to compliance.

Studies of patient demographic characteristics and compliance have not found a consistently significant relationship between patient behavior and race, sex, intelligence, education, socio-economic or marital

status. Only extremes of age have been found to reliably correlate with lower compliance (Becker & Maiman, 1975; Davis, 1968; Marston, 1970).

The body of research on personality characteristics and patient behavior has also been largely unsuccessful in adding to our understanding of compliance. Studies of such personality factors as dependency, illness dependency, authoritarianism, and anomia have not found a consistently significant relationship to compliance (Davis, 1968; Marston, 1970; Kasl, 1983). Individual studies have found certain personality variables to be related to the behavior of patients with specific illnesses and in specific settings. For instance, based on MMPI profiles, patients who dropped out of a cardiac rehabilitation program were more depressed, anxious, socially introverted, and concerned about their health than those who completed the program (Blumenthal, et al, 1982). However, these studies are wrought with methodological faults such as small sample size and measurement of personality factors only after catastrophic health events. One review concluded that "patient noncompliance has become the best documented, but least understood, health-related behavior," (Becker & Maiman, 1975).

Research on the relationship between Locus of Control (LOC) and health and illness behavior has been

the single exception to an otherwise fruitless area of study. In addition to the relationship between the LOC of chronic patients and adherence to treatment regimens (cf. Strickland, 1978), LOC and two other areas of health behavior have been explored. These include predicting preventative health behavior on the part of healthy, nonpatient subjects (cf. Wallston & Wallston, 1981), and the notion of pre-morbid personality as a function of LOC beliefs (cf. Manuck, et al, 1978; DeGood, 1978; Levenson, 1981). Findings in all three areas indicate that neither an internal nor an external orientation is generally more adaptive. Adaptiveness of an LOC orientation is dependent upon its interaction with other variables (cf. Strickland, 1978). For instance, research on pre-morbid personalities indicates that extreme LOC beliefs may form a high risk personality only in interaction with other personality or behavior patterns (e.g. the Type A Behavior Pattern - Manuck, et al, 1978) or the environment (DeGood,1978).

There has been greater success using LOC scales to predict the treatment behavior of patients with chronic diseases than preventive health behaviors in disease free populations. This suggests the importance of controlling for the value of health in addition to the person's belief in control. Logically the value of health is more salient to the chronically ill than to the healthy. Two important reviews of LOC and preventive health

behaviors found the clearest relationships in studies which controlled for both LOC and the value of health for the subject (Strickland, 1978; Wallston & Wallston, 1981). These findings point to the necessity of studying other relevant variables in the system to fully understand the personality - health/illness behavior relationships.

The research focusing on the patient/caregiver relationship has reported findings which can more easily lead to interventions to reduce the "compliance problem". More information and clearer communication about both the disease and its treatment, coupled with a warm interpersonal rapport and shared control between the patient and the caregiver greatly increases the utilization of treatments (Alpert, 1964; Francis, Korsch, and Morris, 1969; Hulka, et al, 1975; DiMatteo, 1979; Friedman & DiMatteo, 1979; Simms & Long, 1979; Taylor, 1979). However, interventions to establish patient/caregiver relationships with these characteristics are still relatively rare.

Where systematic programs have been instituted to develop positive patient/caregiver relationships from preadmission to post discharge, the health and economic benefits have been substantial. Patients treated in a supportive environment where communication and discussion are encouraged have been found to have shorter hospital

stays, adapt better to chronic conditions or disabilities, be more responsible in self-care, and suffer less complications. These include patients who have undergone kidney transplants (Chambers, 1982-83), open-heart surgery (Hospitals, 1979; Rockwell & Rockwell-Pepitone, 1979), mastectomies (Lewis & Bloom, 1978-79; Vachon, et al, 1981-82), and amputations (Rogers, et al, 1977-78). Similar results have been found with diabetic (Weiner & Skipper, 1978-79), and severe burn patients (Vanderplate, 1982-83).

Our failure to routinely address the problem of noncompliance by establishing positive patient/caregiver relationships may lie in the way we approach it. The term "compliance" assumes that the caregiver is always correct and has the authority to command the patient. We see something wrong with the patient who does not follow "doctor's orders" (Friedman and DiMatteo, 1979). Caregivers have almost total control over the choice and formulation of a treatment plan, while the patient is solely and totally responsible for carrying it out (Stone, 1979). Thus, the notion of compliance argues against a relationship characterized by warmth, clear communication, and shared control.

The Stress-Illness Relationship And The Implications For Patient Behavior

There exists an extensive literature on the relationship between stress and illness. The majority

of the research and theoretical discussions have focused on illness as a dependent variable in relation to stressors.

Two extensive bodies of literature have developed attempting to explain how stressors ("life events") produce deleterious effects. One body focuses on the stress-physical disease relationship and the other on the stress-psychiatric dysfunction relationship.

Investigations of the stress-physical disease relationship have generally found significant correlations between the two, (e.g. Krantz, et al, 1974; Garrity, et al, 1978; and Byrne & Whyte, 1980). Similarly, researchers exploring the relationship between stressors and psychiatric dysfunction have found that an unusually large number of stressors have been found to consistently precede onset (Dohrenwend, 1973; Mueller, et al, 1977; Grant, et al, 1978; Webb, et al, 1978; Andrews, 1981; Benjamin, 1981; and Tausig, 1982).

The most intriguing finding coming from both these areas of investigation is that most people do not become severely disabled or subject to disease even when they have been exposed to any number of severe stressors. The majority of investigations of the stress-illness relationships have found correlations below .30 (Hudgens,1974; Kobasa, 1979; Kobasa, et al, 1981; Kobasa, et al, 1982).

In contrast to studies of illness as a dependent variable, there are a number of studies of illness, hospitalization, and surgery as stressors which are more relevant to the issue of patient compliance. Janis (1958) authored the classic work Psychological Stress: Psychoanalytic and Behavioral Studies of Surgical Patients from which two important conclusions can be drawn. First, patients who were unable to effectively cope with stressors earlier in life will most likely not cope well with present illness, hospitalization, or surgery. Second, those individuals who express a moderate degree of fear prior to surgery will do best psychologically and behaviorally, post-operatively.

Sutherland and his colleagues conducted a number of classic studies of cancer and surgical treatment of the disease as stressors (Sutherland, et al, 1952; Bard & Sutherland, 1955; Sutherland & Orbach,1978; Bard & Sutherland, 1978). They reported the importance of several social and personality variables as mediators of the impact of cancer and surgery. These mediators seemed to influence the development of positive vs. negative emotional states, the degree of post-operative functioning/adaptation, and speed and extent of physiological recovery.

Some of their more important findings indicated how important a role social support and the patient's interpersonal relationships play in their adaptation.

For instance, for the patient undergoing a colostomy or a radical mastectomy, the best predictor of a good post-operative marital relationship is a good premorbid relationship. Specifically, the pre-operative sexual relationship is a good predictor of a spouse's ability to give body care to the cancer victim.

The social interpretation and acceptability of an individual's post-operative affect and behavior will effect the patient/caregiver relationship and determine its impact. For example, depressive reactions following mastectomy are more frequent when the hospital staff is not warm and supportive. Not only is social support vital, but the time when it is provided in relation to the initiation of the stressor is a crucial determinant of outcome.

Other findings show the importance of personal beliefs to surgical outcome. A radical mastectomy is most devastating when the patient's self-esteem is primarily based on physical attractiveness. The restrictions in the areas of work and sex reported by colostomy patients are usually far beyond physical limitations, and actually stem from emotionally charged beliefs.

In sum, while a consistent relationship has been shown between the occurrence of stressors and the subsequent development of physical disease, mental

dysfunction, and emotional distress, this relationship is a modest one. Most individuals do not suffer psychologically or physically as a result of being subjected to stressors. Further, certain types of interpersonal relationships, behaviors, perceptions, and personality factors characteristic of the subject and those around him/her seem to enable persons to cope and adapt to stressors. In short, people's responses to a stressor are dependent not only on their own characteristics, but on the system within which they reside. We can conclude, from this, that changes in the caregiving system may enhance the patient's ability to respond to stressors, including illness and surgery.

In an effort to add to our understanding of how personality plays a role in people's response to stressors, a personality style has been articulated which integrates several theories.

The Hardy Personality Style

We can see from the above discussion that research on the affect of stressors on human beings has traditionally focused on explaining its deleterious effects. Investigations in this area and the coping literature have also treated people as unproductively avoiding or passively enduring stressors (Bard, 1985). Consequently strategies for "dealing" with stressors have centered on avoiding or limiting exposure to them. For individuals forced to enter into a stressful situation,

i.e. the modern hospital, this perspective is very discouraging. Specifically, patients electing to undergo a surgical procedure may see no opportunity for positive action in response to the stressors of hospitalization and surgery. They must passively accept the experience and "hope for the best".

Fortunately an alternative position exists. A substantial amount of psychological theory has focused on the human tendency to create and thrive during periods of change. Building on these schools of thought, Kobasa (1979) sought to describe the person who welcomes, and thrives during, periods of stress. The cornerstone of her theory is existential psychology. Existentialism sees the person as living in a constantly changing environment with the never ending task of using new emotions, thoughts, and actions to grow through life (Kobasa & Maddi, 1977).

Kobasa (1979) defined the hardy personality style as the characteristic ways of thinking, feeling, and acting in the world which result in personal growth rather than debilitation. The basis of the hardy personality style is a perceptual framework through which an individual interprets the world around him/her. This perceptual schema leads to growth oriented cognition, emotion, and behavior. It is composed of three integrated components: 1)commitment; 2)challenge; and 3)control.

The first component, commitment, is a sense of value, meaningfulness, and loyalty towards oneself and one's purpose in life. Cognitively it is a pervasive curiosity and desire for knowledge. Behaviorally it is expressed by deeply involving yourself in the activities, relationships, and communities relevant to you (Kobasa, et al, 1982). Constructs similar to this component have been posed as mediators of the impact of stress. For instance, it is similar to Antonovsky's (1979) "sense of coherence" and the existential concept of "authenticity" (Kobasa & Maddi, 1977).

Challenge mitigates the stressful effects of events by providing an optimistic perceptual screen. The basis of the challenge component is the belief that change is inevitable in life and should be welcomed. From a challenge perspective opportunity only comes through change (Kobasa, et al, 1981; Kobasa, et al, 1982). Challenge fosters a willingness to leave behind the status quo to develop and grow with a new set of circumstances. Those who have challenge in their personality style will look upon a confusing series of events as a puzzle to be solved rather than a storm to be weathered. Challenge leads to behaviors such as problem-solving and searching for new experiences.

Control is a belief in one's ability to influence events. Since hardy individuals believe behavior will be effective, they take action (Kobasa, et al, 1981).

These individuals, therefore, do in fact influence events and take some control of any situation. Kobasa's control is very similar to Rotter's "belief in internal control" in the Locus of Control construct (Rotter, 1966). Internal control is the belief that one controls one's destiny in life; the reinforcements and consequences one receives being a direct result of one's actions.

Hardiness is the theoretical development of Selye's statement that it is "how you take it" (Selye, 1976, page 74) that determines whether a positive or negative outcome results from a stressor. Hardy persons tend to see stressors as changes, providing opportunities for growth towards attaining desired goals. Hardy persons further believe they can control "stressful" situations. It is because of this perspective that they thrive in, rather than succumb to, new circumstances.

Direct support for the validity of the hardiness theory was first found in a retrospective and later in a prospective study (Kobasa, 1979 and Kobasa, Maddi, & Kahn, 1982 respectively) of hundreds of middle and senior managers working for a large utility. The individuals in both studies were subject to the stressors produced by the company's divestiture from a nation-wide utility and its entry into the competitive marketplace. In the retrospective study, the managers who scored high on personality hardiness reported low-

illness scores under conditions of high stress. Those scoring low on hardiness were found to have high-illness scores under conditions of high stress. The two groups were found to be similar in terms of job level, age, socio-economic status, and religion.

The prospective study (Kobasa, Maddi, & Kahn, 1982) found that illness could be predicted by life event scores and hardiness. The latter acted to decrease illness, while the former worked to increase illness. Of particular interest is the fact that these two variables interacted with each other. The result of this interaction is that hardiness is more powerful in reducing illness during periods of high-stress.

Studies of attorneys and gynecology patients have shown that hardiness increases the stress resistance of groups other than male, business managers, (Kobasa, 1982). In addition, similar studies of nurses and medical residents are presently underway to further establish the generalizability of these findings (Kobasa, 1985). One limitation of the hardiness literature to date is that it has typically treated illness as a dependent variable. One contribution of this study is that it treats illness as an independent variable, with hardiness moderating behavioral responses.

That the efficacy of the hardiness construct in the study of the stress-illness relationship has been supported is not surprising. As previously mentioned,

the control component of hardiness is based on the Locus of Control (LOC) construct (cf. Rotter,1966) which has been found to correlate with patient behavior (see above).

The hardy personality style clearly has two advantages over LOC and other unidimensional personality constructs. It accounts for three related factors at the same time. In addition, the commitment, control, and challenge factors address the way in which individuals see themselves in relation to their environment. This is especially important from a systems perspective. It naturally allows us to link the individual's personality style with system factors (e.g. interpersonal relationships, significant other's personality style, task characteristics, and type of stressor) in formulating predictions. Finally, hardiness is described as a personality style rather than a stable personality trait. This is because it is conceived of as, and has been shown to be, subject to change (Kobasa, 1985; Maddi & Kobasa, 1984). Therefore, findings concerning the appropriateness of hardiness in certain situations can lead to interventions to increase hardiness. Previous studies of personality traits and health behavior often do not contribute to practical solutions to the issues investigated.

Hardiness has not been proposed as the sole source of stress resistance. It is seen as only one of the group of cognitive and emotional resistors in Antonovsky's (1979) theoretical model of six categories of resistors (Kobasa, 1983). Since hardiness is a perceptual framework which leads persons to act in the environment, an interaction between hardiness and the resistors in the other categories is expected.

The interaction between hardiness and only two other categories of resistors have been studied. These are the physical and interpersonal-relation categories. Constitutional strength has been found to decrease illness and to be independent of both hardiness and the occurrence of stressful life events (Kobasa, 1982).

Reviews (Wortman, 1984; Wortman & Dunkel-Schetter, 1979) of social support as a moderator of the relationships between illness and stress and vice-a-versa, report evidence contradicting the notion that social support is always good (Cobb, 1976). While the majority of studies do report a beneficial effect of social support, the relationship is by no means clear cut (Wortman, 1984; Wortman & Dunkel-Schetter, 1979). In fact in certain circumstances particular types of support may be detrimental. For instance, medical advice from friends may be perceived as unhelpful, and infringing on the physician's role. The type of network offering support seems to influence its effect. Support from

high density social networks may hamper one's ability to gather and process new information. Small, dense networks may reduce one's coping abilities as a result of limiting norms. The type of support offered also plays a role. For example, optimism expressed by others' in response to one's catastrophic illness may lead to feelings of isolation. Certain individuals may not be able to adequately offer support to others. Surprisingly, there is some evidence that those who are most empathetic are least able to show support (Wortman, 1984; Wortman & Dunkel-Schetter ,1979). While a great deal of research has taken place, little has been offered in terms of explaining the mechanism(s) by which social support exerts its influence. Hardiness research may be able to clarify this issue by shedding some light on how individuals process support.

A model has been proposed which explains how hardiness may influence the degree and way in which social supports are utilized to moderate the impact of stressors. It appears as follows:

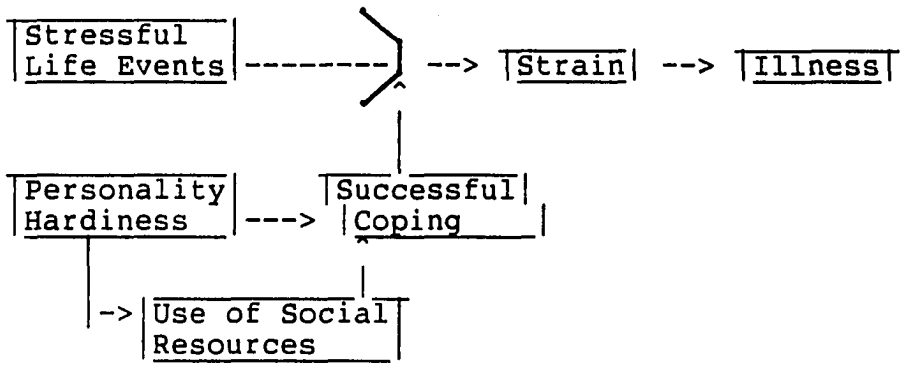


Figure 1.
Hardiness, Social Resources, and The Stress-Resistance Process
(Kobasa & Puccetti, 1983)

A study of 204 business managers (Kobasa & Puccetti, 1983) looked at the interaction between hardiness and three kinds of social supports in moderating the effects of stressors. The social supports were boss support, family support, and social assets. Social assets included occupation, parents' occupations, marital status, education, and membership in community groups as measures of one's status in society.

Executives who showed high hardiness also presented low illness scores. None of the social supports had a similar main effect on illness scores. Social assets did not interact with hardiness to produce any significant effect on illness. However, when a subject scored high on hardiness and perceived support from a superior the interaction further reduced the illness

score.

The analysis of the interaction between hardiness and family support yielded even more interesting results. For subjects low in hardiness, perceived family support lead to increased levels of reported illness. Family support acted to increase resistance to stressors only when hardiness was high.

In an earlier study (Kobasa, 1981), lawyers' levels of strain symptomatology were found to increase the greater their level of social support (defined as the number of persons they discussed work related stressors with). Social support was found to correlate with the practice of regressive coping behaviors. These behaviors include drinking, smoking, withdrawing, acting apathetically, and expressing anger in response to stressful events.

These studies indicate that how people use or process social support may differ depending on their hardiness level. Persons low on hardiness may not be committed to their goals or activities, may tend to see changes as insoluable problems, and may see themselves as having little control over their life. In short, their perception of the environment may be highly pessimistic. Given the choice of fight or flight they may chose the latter. So, when offered unconditional support from friends or family, persons low on hardiness may involve

themselves in interpersonal relationships in a dependent way to passively accept stressors and their consequences (Kobasa & Puccetti, 1983). Further, since they are not committed to what they are involved in, including relationships, they may not be concerned with the toll their dependency might take on others .

Hardy individuals should respond to stressors by involving themselves in relationships as part of their problem-solving or challenge orientation. As a result of the control component they should predict success in using relationships to benefit from stressful situations. It is important to note that hardy persons value and are committed to what they are involved in. Accordingly, they should have a sense of responsibility to those with whom they have relationships. They should then want to avoid any negative effects of stressors so as not to burden those they are close to with their situation. In short, they should be committed to remaining a viable part of the community (Kobasa & Puccetti, 1983).

THE HARDY PERSONALITY STYLE AND PATIENT BEHAVIOR

It is my belief that the study of hardiness will lead to an important understanding of the variation in patients' behavior. It should be particularly helpful in explaining patients interaction with caregivers, their behavioral responses to treatment (i.e. compliance), and consequently the outcomes of treatment. My current concern is to discern the motivating factors which

determine inpatient behavior.

Previously discussed research on hospitalizaton and surgery as stressors points to the importance of considering all components of the healthcare system in predicting illness behavior. While the focus of this study is on patient personality style, I do not mean to negate the importance of other factors. Since hardiness is subject to change through social influence (cf. Maddi & Kobasa, 1984), I expect that some caregivers will elicit more hardy behavior than others. Interaction between caregivers' and patients' hardiness levels is expected. Consideration of such issues is outside the scope of this study and is left for future efforts.

As it predicted illness in response to stressors in the business world (Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Kobasa & Puccetti, 1983; Maddi & Kobasa, 1984), hardiness should predict response to the stressors of disease and medical treatment. A modified and expanded version of the model (Kobasa & Puccetti, 1983) previously discussed forms the basis for my predictions (see figure 2). My model details two alternate pathways in response to the impact of disease. The individual's level of hardiness determines which pathway he/she will follow.

According to my model, the hardy individual is committed to life activities and therefore will seek to minimize or eliminate any disruption, in this case

disease and medical treatment. In addition, as a function of the challenge component he/she will interpret disease as a problem to be solved. This will lead the person to assess the need for, and alternative types of, treatment. Social and healthcare resources will be utilized to provide information regarding treatment choices (see figure 2, C1). For instance, friends and family will be asked for referrals to physicians, clinics, and hospitals. They will also be asked if they have ever suffered from a similar disease and what their experiences were like. Physicians, allied professionals and healthcare organizations will be asked for their recommendations and available services. Second opinions will be sought. Third-party insurers will be asked how much coverage will be provided for each alternative.

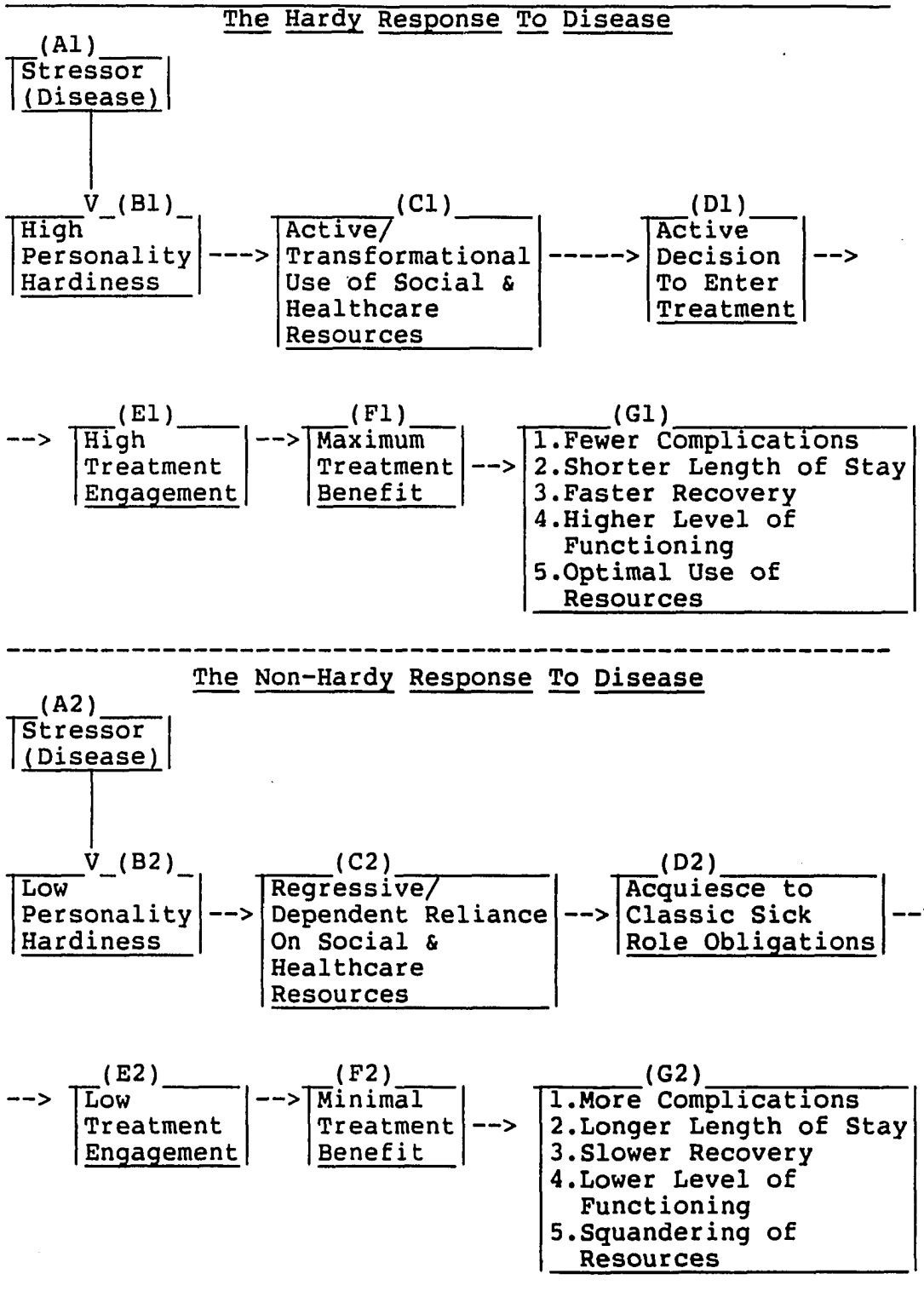


Figure 2.
The Hardy and Non-Hardy Responses to Disease

This is a process of active and transformational use of social and healthcare resources. While the existence of this type of process has not been directly tested, it fits with the findings of an interaction between hardiness and social support (cf. Kobasa & Puccetti, 1983, reviewed above) and anecdotal evidence collected by researchers and psychotherapists (Maddi & Kobasa, 1984). Demographic characteristics may influence the amount and/or type of resources available for use in this process. Therefore, research should control for sex, age, marital status, race, insurance coverage, and income level.

My model assumes that the individual's assessment of the disease and alternative responses will objectively find professional medical treatment as the most beneficial response to the disease stressor. I assume this because medical treatment should be the most certain way of obtaining a quick and effective cure and return to normal activities. For the hardy individual, the most beneficial alternative is the one which will allow continued involvement in the life activities to which he/she is committed. In this particular study, this alternative includes hospitalization and surgery.

Having assessed the best alternative, the hardy person will actively decide to enter treatment (see figure 2, D1). In addition to the routine scheduling of appointments and such, the hardy patient will select

caregivers based on the above assessment and personal preferences. He/she will also adapt his/her lifestyle to account for the demands of undergoing treatment. For instance, faced with a hospital stay arrangements will be made for bills to be paid, the home to be watched, children cared for, and professional responsibilities delegated. Once these preparations are made treatment will begin.

At this point a patient's illness behavior is traditionally evaluated in terms of compliance. This is simply the level at which an individual follows the treatment recommendations of a healthcare provider. It does not consider whether the person values, understands, or has made decisions regarding treatment. It also does not consider the person's relationship to the healthcare system (Leventhal, 1983). I propose a new construct, health engagement, against which illness behavior can be measured. Health engagement is the degree to which individuals value, and attempt to retain control of, their health status through active involvement in the healthcare system. There are two dimensions of this construct, preventive health engagement and treatment health engagement. Relevant to this study, treatment health engagement is the level at which an individual values, makes decisions regarding, and is actively involved in the curative or palliative measures taken in

response to disease.

The advantage of this construct is that it describes adaptation rather than adjustment to social expectations, i.e., obedience to medical authorities. It is possible for an individual to be very high on compliance, while being very low in terms of treatment health engagement. This is the case where the person is not committed to his/her treatment, but follows recommendations because the sanctions imposed for noncompliance are perceived as too costly. Conversely, an individual could exhibit a low rate of compliance, while expressing a high level of treatment health engagement. This occurs when an individual decides that treatment recommendations are not appropriate to follow. He/she retains control of the situation by refusing to comply and pursuing alternatives.

Returning to the model, the hardy individual will enter a phase of high treatment engagement (see figure 2, E1) characterized by dedicating his/her efforts towards curing the disease, and exercising control over his/her treatment. It is important to point out that the hardy individual actively addresses challenges. As a result hardiness will lead to maximum benefit from treatment in four ways (see figure 2, F1).

First, being committed to curing the disease, believing he/she can influence the outcome of treatment, and having actively selected the treatment, the hardy

individual will carry out prescribed activities to the fullest. For instance, post-operative rest and exercise schedules will be followed diligently. When offered the option of moving forward or resting the hardy person will choose action. The hardy patient will say "yes" to questions such as "Are you ready to try walking down the hall today?".

Second, additional stressors not associated with treatment will be kept to a minimum. The hardy individual will have already prepared the world for his/her temporary absence, as described above. Committed to treatment and recovery, hardy individuals will not accept new demands such as the office asking for an opinion over the phone.

Third, anecdotal evidence (Maddi & Kobasa, 1984) suggests that hardy individuals affect others in a way that produces additional positive support for their efforts from others. For example, as a result of their relationship a nurse or physical therapist might find an extra few moments to spend with the hardy patient encouraging and coaching his/her postoperative exercise.

Finally, as active participants in their treatment, hardy patients will overtly oppose and discuss any treatments they do not agree with. Time and medical resources will not be wasted by passive/aggressive patient behavior. Hardy patients will engage in more

self-care, so resources will not be expended supporting patient dependency.

As a result of receiving maximum benefit from treatment the outcome for the hardy patient will be extremely positive. There will be fewer complications. This will be a result of more responsible self-care as well as clear communication between patient and caregivers. The hardy patient's active pursuit of health and high personal expectations will lead to a faster achievement of rehabilitation goals. A shorter length of stay will result. After discharge, being committed to and feeling in control of his/her recovery the patient will continue to care for him/herself responsibly. Even unsupervised, hardy individuals will not accept minimal progress or recovery of function, they will be committed to overcoming limitations. Finding ways to improve performance will result in their achieving a higher level of function. Since hardy persons see the challenge of life as matching the problems in the environment with the resources available to solve them, they will ensure optimal use of healthcare resources. As a result an overall faster recovery will be achieved.

The response of non or low hardy people to disease and treatment will be much different. They will not be invested in staying involved in their daily activities or relationships. Disease will not be seen as a temporary

disruption of a life plan, but as an uncontrollable fate. Their lack of commitment and control, coupled with their pessimistic perception of problems as overwhelming will result in a regressive/dependent reliance on social and healthcare resources (see figure 2, C2). They will offer a helpless picture to which people will respond by taking control. As opposed to the hardy individual's active evaluation of recommendations, the low hardy person will accept information at face value. A decison-making process where alternatives are evaluated will not be undertaken.

Where the hardy will actively decide to move into treatment, the low hardy will eventually acquiesce to society's judgement that they are not fulfilling their obligations and must cooperate with treatment (see figure 2, D2). Passively entering treatment no preparations are made with regard to the rest of life's demands and responsibilities.

Not having committed themselves to curing their disease, low hardy persons will evidence low treatment engagement. Dependent, they may comply with treatment protocols, but will not exceed minimal expectations. Their behavior may regress to the point where they do not participate in treatment. In such cases, they will still maintain a compliant facade by offering excuses acceptable to the caregivers. They will develop

relationships with caregivers which support regressive coping such as anger and apathy (Kobasa & Puccetti, 1983). The hallmark of these relationships will be a high number of complaints and requests for the caregivers to "make me feel better". In sum, low hardy patients are acted upon by caregivers. They will not act as partners in their own treatments, nor be committed to returning to their usual activities.

As a result, low hardy patients receive minimal benefit from medical treatment. They will not reliably exercise, rest, or take medications, unless monitored. Given the choice, they will let others do for them and not take up new challenges. Time will be spent encouraging them to do the minimum in their own behalf. For the low hardy patient motivation to "get better" will come from the environment, not from within. In addition, caregivers will begin to believe that the patient knows his/her own potential, or are beyond their ability to motivate him/her, and so they will lower professional expectations. Hence more treatments will be required to accomplish goals.

The overall result for low hardy patients will be a costly one (see figure 2, G2). Given that they will leave their care to others, low hardy persons will not be self-observant. They will fail to notice signs and symptoms, that their medication is late, or dressing soiled. This will increase the liklihood of medical

complications during the course of treatment. More treatments to accomplish minimal goals plus more complications will equal a longer length of stay. Failure to assume responsibility for post-discharge care will lead to a slower overall recovery. Lack of commitment to their life and activities will lead to an acceptance of a lower level of functioning.

HYPOTHESES

As a first step in testing the proposed model this study will examine the general hypothesis that surgical patients who are hardy will be more engaged in their treatment and use fewer medical resources from hospital admission to discharge. The specific hypotheses to be tested in this research are as follows.

Hi-hardy patients when compared to lo-hardy patients will:

1. More actively engage in post-operative physical therapy
2. Demonstrate a higher level of physical functioning prior to discharge
3. Manifest fewer post-operative medical complications
4. Spend fewer days in the hospital
5. Express fewer verbal complaints.

CHAPTER TWO

METHOD OF PROCEDURES

OVERVIEW

This study tests the proposed model by investigating the relationship between hardiness and post-operative behavior and outcome in a distinct group of surgical patients. The study sample was drawn from the population of individuals electing to undergo a total hip arthoplastic replacement (THR) procedure as a result of having degenerative joint disease of the hip. Surgery in all cases was performed at a single orthopaedic hospital (hereafter, the hospital will be referred to as Hospital X). The study was sponsored by a rheumatologist and co-sponsored by an orthopaedic surgeon; both are attending physicians at Hospital X. Data collection was structured to be, and was, minimally disruptive to both patients and caregivers. The bulk of the data collected was culled from the patients' medical records, with only one patient interview required for study purposes.

THE MEASURES

Hardiness Measure

Hardiness was measured by administering the verbal form of the Personal Views scale (Kobasa, et al, 1985). The scale consists of 45 items in a four point Likert format which were administered with eleven experimental items (see Appendix A). Five of the experimental items were also presented in the four point Likert format; the

remaining six experimental items were constructed with a five point Likert format. The verbal form of the Personal Views scale includes three subscales one for each of the three theoretical components of the hardiness construct: control; commitment; and challenge. Each subscale consists of 15 items.

All items were adapted for verbal administration from the long form of the Personal Views scale (The Hardiness Institute, 1983). The individual items included in this instrument were derived through factor analysis from five scales previously used to assess hardiness (Kobasa, 1985). These included the alienation from self, alienation from work, and powerlessness scales of the Alienation Test (Maddi, Kobasa, & Hoover, 1979), the security scale of the California Life Goals Evaluation Schedule (Hahn, 1966), and the Internal versus External Locus of Control Scale (Rotter, Seeman, & Liverant, 1962).

Qualitative Questions

A series of 17 open-ended questions was included in the interview protocol to enrich the basis upon which the quantitative results of this study could be interpreted (see Appendix D). These questions concerned issues related to the patient's first recognition of a problem with his/her hip, how and why the decision was made to undergo surgery, prior surgical experiences, expectations

concerning the outcome of the surgery, preparations for surgery, and self-perceptions.

Assessment of Post-Operative Patient Behavior and Level of Physical Functioning.

Physical therapists treating THR patients routinely record behavioral observations of each patient. Therapists assess both level of physical functioning attained and/or quantity performed for each treatment exercise or activity. These observations are recorded for each of the following behaviors: transferring out of bed; ambulation with a walkerette; ambulation with Lofstrand crutches; hi-chair sitting; and stair climbing.

Level of functioning for each behavior (with the exception of hi-chair sitting) was rated on a four point scale (0 - 3). On this scale 0 indicated that the patient required no assistance to complete the behavior and was completely independent in this area of functioning. Patients who required the maximum amount of assistance to complete a behavior received a rating of 3. Level of functioning for hi-chair sitting was assessed by recording the number of minutes a patient was able to continuously sit in the hi-chair. In collaboration with the Chief Physical Therapist who served as consultant to this study, the investigator developed an equivalency chart (see Appendix E) to translate minutes of continuous sitting to an estimation of physical functioning on a four point scale similar to that used for the other

behaviors, (i.e. 0 - 3).

Quantity of activity performed for ambulation with the walkerette and/or the crutches was recorded in terms of the number of linear feet ambulated. Patients ambulated in the corridor on their floor during treatment. All patient floors in Hospital X share an identical lay-out. This allowed the training of physical therapists to identify standard markers in the hallway to accurately measure distance ambulated. For instance, from room 611 to the nurses station is 25 feet, to room 620, 50 feet, to the linen room, 75 feet, and so on.

Therapists were trained to assess level of functioning using the 4 point scale and to measure distance ambulated using hallway markers as part of their regular orientation to practicing in the hospital. They were therefore experienced in these matters prior to the onset of the study.

The post-operative physical therapy protocol is structured so that more difficult or complicated behaviors are added to the patient's repertoire as competency is gained in easier ones. Patients vary in terms of the rate at which they add new behaviors. For this reason, the post-operative day that each new activity in the treatment protocol was attempted was recorded.

Post-operative Complaints

A count of the number of times each patient voiced a post-operative complaint in any one of twelve categories was kept. These categories were defined based on the results of the pilot study (see below). The categories were: operative pain; other pain (not related to the surgical insult); nausea; vomiting; loss of appetite; constipation; stomach complaint (other than one of the preceding four types of complaint); dizziness; headache; fatigue; skin complaint (e.g. rash, itch, dry); and complaint of emotional discomfort (depression, sadness, anxiety, anger). Separate counts for each category were kept for complaints offered to physicians versus those offered to non-physician caregivers. The physician counts included complaints noted not only by the attending surgeon but by all physicians caring for the patient. These included residents, interns, psychiatrists, and internists. The non-physician count included complaints noted by all those other than physicians who would enter a note in the patient's chart. These included nurses, physical therapists, occupational therapists, social workers, and nutritionists.

The counts were taken by reading the patient charts after they were discharged.

Demographic And Descriptive Data

Number and type of post-operative complications, length of hospitalization, secondary diagnoses (if any),

and all demographic information was obtained from the patient's medical record. Demographic data included age, ethnicity, marital status, insurance coverage, occupation, religion, and education. Secondary diagnoses and post-operative complications were categorized using the Medicare DRG classification system, based on the International Classification of Diseases - Ninth Revision. Length of hospitalization was counted from the operative day until day of discharge.

THE POPULATION

The Disease

As previously noted the individuals in the population under investigation suffer from degenerative joint disease (DJD). This is a form of chronic arthritis found in the middle-aged and elderly. Fifty percent of all those 50 years and older show some roentogenographic signs of the disease (Aegerter & Kirkpatrick, 1975; Brashear & Raney, 1978). As opposed to rheumatoid arthritis, DJD most often affects only one joint (usually weight-bearing), and is characterized by degenerative changes in articular cartilage and bony overgrowth of the joint margins. There is usually little inflammation present.

Etiologically, cases of DJD may be classified as primary, where no underlying cause is apparent, or as secondary, where an antecedent disease or injury is

believed to have precipitated the process. The most common form of the disease is the result of a continued demand for excessive function with a decreasingly efficient blood supply. The body responds by growing new bone in a faulty attempt at repair, causing spurs and "lipping", or overgrowth (Aegerter and Kirkpatrick, 1975).

The disease is progressive and eventually results in cartilage losing the ability to withstand mechanical stressors due to splitting, fibrillation, thinning, and gross degeneration; the bone becoming denuded, eburnated, thickened, and deformed. Once alterations have occurred they are permanent (Aegerter & Kirkpatrick, 1975; Brashear & Raney, 1978; and Dunleavy, 1985).

DJD limited to the hip joint is common (Brashear & Raney, 1978; Dunleavy, 1985), and is a representative form of the disease in terms of its signs, symptoms, and course. Afflicted individuals first notice stiffness of the hip in the absence of pain. As the disease progresses signs and symptoms increase in number, regularity, and severity. In the later stages of the disease, periods of severe pain and disability become recurrent and protracted.

The actual progression of the disease process is extremely variable with pain becoming incapacitating over a great many years, or in less than a single year. It is rarely totally disabling unless affecting the hip

(Aegerter & Kirkpatrick, 1975; Brashear & Raney, 1978).

The Decision To Undergo Surgery

While this disease eventually becomes severely debilitating, physicians encourage patients to endure it as long as possible before performing a total hip replacement. This is because the synthetic components of the prosthetic joint are prone to wear and break after 20-30 years of use. Surgeons are concerned that a total hip replacement performed at age 40 (typically a time of stable mental and physical health) may have to be repeated at age 70 (when a patient's general health is likely to have begun to deteriorate). Therefore, patients are encouraged to accept a conservative approach to treatment for as long as possible to minimize the need for repeated surgery. Conservative treatment usually consists of one or a combination of analgesics, anti-inflammatory agents, exercise and/or physical therapy.

Surgical intervention is indicated when the patient reports that, despite appropriate nonsurgical treatments, the pain and discomfort have reached intolerable levels, and are disabling to the individual (Aegerter & Kirkpatrick, 1975; Brashear & Raney, 1978; Dunleavy, 1985). The decision as to when to resort to surgery is therefore influenced by the person's occupation (i.e., physical labor vs. sedentary work), life-style (i.e. active vs. passive), and subjective perceptions.

Surgical options include excision of the membrane lining the joint (synovectomy), partial replacement of the joint structure (i.e. cup or mold interposition, or femoral replacement), total hip arthroplasty (replacement), or the most radical procedure arthrodesis (total removal of the hip joint without prosthetic replacement) (Goldstein & Dickerson, 1981; Walker, 1977; Brashear & Raney, 1978; and Dunleavy, 1985).

Total Hip Arthoplasty

The most effective of the surgical alternatives is the total hip arthoplasty or replacement. Total hip replacement is always performed on an elective basis. Therefore, the patient is stable and a good surgical risk, and the patient and surgeon have agreed to the operation. The total hip procedure is an arthoplastic procedure in which the ends of both bones comprising the hip joint are excised and replaced with a prosthetic joint. It is generally performed under spinal anesthesia.

While only perfected in the last two decades, this procedure has been performed on tens of thousands of patients. It is the most successful surgical option in terms of reducing both pain and stiffness (Brashear & Raney, 1978; Dunleavy, 1985). It is in fact perhaps the most successful of all anatomical replacements (Goldstein & Dickerson, 1981).

The Total Hip Treatment Protocol

The patient is admitted to an inpatient surgical unit one day prior to the scheduled operation, for testing and evaluation. During this pre-operative period the patient is subjected to admission and nursing interviews, a physical examination, x-rays, an EKG, and extensive laboratory tests.

Immediately prior to surgery, the patient is prepared for surgery, sedated, and transported to the operating room.

Post-operatively the patient recovers from sedation in the recovery room. Both legs are restrained by an abduction splint and a retention catheter is in place. The patient is returned to his/her room within several hours. The effects of the spinal anesthesia are not fully dissipated until 24-48 hours post-operatively.

The most constant relationship the patient has is with the physical therapist. As can be seen from the treatment protocol (Appendix B) the physical therapist works with the patient from the pre-operative day to the day of discharge. In fact in some facilities this relationship will be continued on an outpatient basis (Dunleavy, 1985). In addition, the physical therapist will be the only caregiver genuinely requesting that the patient take an active role in his/her treatment and recovery.

On average, the patient is discharged from the hospital 14.4 days after hospital admission, or 12.4 days after surgery (Admissions Director, 1986). This is followed by a period of outpatient physical therapy and follow-up examinations with the surgeon.

Rationale For Selecting The Population

This population was selected with the following considerations in mind. First, a disorder and treatment requiring hospitalization was preferred to control for environment and to facilitate data collection. The hospitalization would also have to be of sufficient length to observe behavior over time. As noted above, postoperative recovery from this procedure requires an average postoperative hospitalization of 12.4 days. This is one of the longest inpatient postoperative periods in an era of increasingly short "length of stays".

Second, in order to limit complicating factors (e.g., effect of the disease on the patient's mental status or life expectancy) a localized disease, without systemic involvement, was preferred. As described above, DJD of the hip is a localized disease process. In addition, the hip is anatomically the simplest major joint in the human body. Its' involvement with potentially complicating tissue (e.g., ligaments, muscle, connective, and vascular) as well as its' genetic

variation are the most limited of any joint in the body.

Third, the hardiness construct and our model predict how individuals will choose to deal with stressors. Therefore, a disease process where decisions made by the patient play a central role was sought. The total hip replacement is always an elective procedure, which physicians try to forestall as long as possible. Therefore, patients make an active decision to undergo the procedure.

Fourth, this surgical procedure is highly successful and leaves patients in a very similar condition postoperatively, which further limits the possibility of confounding factors. Anatomically the source of pain for the study population will be "standardized" by the surgical procedure. Specifically, the hip joint will be totally removed from each patient. This will eliminate the physiological variation in pain due to inter-patient differences in the deterioration of the hip joint. Post-operatively the physiological sources of pain will be limited to the surgical insult. The source of pain will have changed from a chronic to an acute one. Acute pain is self-limiting in nature and expected to disappear in at most a few weeks. While psychological factors influence the perception of acute pain, it is not primarily caused by environmental factors or psychopathology (Halpern, 1984).

Finally,, THRs are performed on a population of

individuals representing all socio-economic and cultural groups within the United States (Aegerter & Kirkpatrick, 1975; Dunleavy, 1985).

THE SAMPLE

The study sample consists of 52 patients admitted to medical/surgical inpatient units of a major, urban, orthopaedic teaching hospital (Hospital X.) Subjects underwent elective surgery for total hip arthroplasty or replacement (THR) as treatment for degenerative joint disease. Patients undergoing a total hip replacement as a result of a traumatic injury or with another primary diagnosis were excluded from the sample, as were those with a history of psychiatric illness.

Hospital X was selected as the study site because it is an orthopaedic, teaching hospital. Therefore, an extremely high number of THRs (approximately 500 - 600) are performed there each year. This greatly facilitated sample selection and reduced the overall time required to complete the study (had it been done at a large general hospital) by an estimated 9 - 12 months.

Sampling Procedure

Initial Sample Selection.

The investigator's two physician co-sponsor's presented the study to the attending orthopaedic surgical staff and requested their approval and support. Specifically, the surgeons were asked to assist in the

selection and recruitment of THR candidates for participation in the study. The surgeons unanimously supported the study. They did request that the investigator, himself, select and recruit appropriate surgical patients, rather than involve the surgeons in the selection of individual patients. It being understood that only patients undergoing THRs on an elective basis, without prior psychiatric history would be included in the study. All surgeons gave their approval to include all their patients in the study that the investigator selected as appropriate and who freely volunteered to participate.

Elective surgical procedures at Hospital X are scheduled as much as a year in advance. A month prior to any given date the majority of elective procedures are already on the admissions calendar. The Admissions Director of Hospital X provided the investigator with a special listing of all admissions for THR's scheduled during the sample selection and patient interviewing phase of the study (October 15, 1986 through December 20, 1986). Every two weeks thereafter an updated listing was provided.

Time limitations precluded the investigator from requesting consecutively admitted THR patients to participate in the study. Therefore, the lists of scheduled admissions were used to identify days when three or more appropriate patients were scheduled for

admission. Admissions for all elective surgeries are scheduled for Sunday through Thursday of each week (including holidays). Admissions are scheduled based on the availability of operating rooms. There appeared to be no systematic variation in the scheduling of THR admissions across days of the week.

On each day when three or more THR admissions were scheduled the investigator went to Hospital X to recruit and interview patients. (There were four exceptions to this which were days when the investigator was unable to free himself from other commitments.) On each day, the investigator stopped at the Admitting Office to obtain a copy of the Daily Admissions Sheet. This sheet was cross-checked against the special listing of scheduled THR admissions previously obtained. Each patient's name, medical record number, diagnosis, surgical procedure, physician, and age was cross-checked. Where discrepancies were found the Admitting Clerk on duty was asked to verify the information on the Admitting Department's computer system. In addition, patients who had cancelled or postponed their surgeries and those who had scheduled their surgery since the last special list was run were identified.

In five instances patients were incorrectly listed on the special list as THR admissions. In twelve instances patients had cancelled or postponed their

surgery. Approximately 20% of the time admissions had been scheduled since the last special list was run.

The medical record of each patient selected through this cross-checking process was reviewed by the investigator on the patient floor to which the patient was admitted. This was the final check to ensure that the patient met the criteria for inclusion in the study. Specifically, individual medical records were checked for the appropriate diagnosis and procedure (DJD of the hip and THR) and absence of a prior psychiatric history. On two occassions this final check revealed patients that were incorrectly listed on both the special list and the Daily Admissions Sheet as THR patients. In both cases they were Total Knee Replacement (TKR) patients appearing as THRs due to a typographical error. No patients with prior psychiatric histories were found.

When a patient was 80+ years of age an additional check was made by contacting the patient's primary nurse and asking for his/her assessment of the patient's alertness and overall ability to comfortably participate in this study. On three occassions the primary nurse suggested that the patient not be recruited. Reasons given were general confusion (2) and anxiety (1).

A total of 66 patients were selected for recruitment through this screening process.

Recruitment of Subjects.

All patients who met the criteria for inclusion in the study were personally visited by the investigator within 12 hours of admission. This was necessary since patients were scheduled to spend only one pre-operative day (day of admission) in the hospital.

After knocking and being invited to enter the patient's room the investigator introduced himself and provided a brief explanation of the study. The patient's participation was then solicited. Generally, these opening remarks were as follows:

Good Afternoon! My name is Leo Flanagan. I'm a researcher working with Dr. (Sponsoring Rheumatologist). You are (patient's name) correct? (Affirmative Response.) You're scheduled to have a Total Hip Replacement tomorrow, right? (Affirmative Response.)

Dr. (Sponsoring Rheumatologist) and I are conducting a study to try and understand what helps people do better after undergoing surgery. It's our hope that the information we collect will help people who undergo Total Hip Replacements and other types of surgery. We hope we'll be able to advise doctors and nurses on how to prepare and support patients before and after surgery. We also think we'll be able to make some recommendations on coping with surgery to patients themselves.

Dr. (Name of Attending Surgeon) has given us permission to ask you to participate in the study.

Your participation is totally voluntary. Whether or not you participate will in no way affect or change the treatment you receive.

We are simply asking patients who agree to participate to spend approximately 45 minutes being interviewed by myself prior to undergoing surgery. The interview would consist of my reading a series of questions and you responding to each by picking one of four choices. Then, I would ask you a few brief questions about how you decided to have the surgery and what the difficulty with your hip has been like for you.

Patients who agreed to participate were asked to read and sign a consent form (Appendix C). All patients were offered the option of having the investigator read the consent to them. Approximately 25% of the participants stated that reading the consent was not necessary and that they would simply sign it. In each of these cases the investigator read his copy of the consent to the patient and then allowed the patient to sign their copies. Each patient signed a copy of the consent for hospital records and retained a copy signed by the investigator for his/her own records.

Sixty patients, of the sixty-six recruited, participated in the study. Six did not participate for the following reasons: wanted the consent form reviewed by her attorney daughter (1); spoke only Spanish (1); refused no reason (1); had to discontinue interview because of surgical preparation (1); and anxiety (2).

DATA COLLECTION

Pilot Study

To ensure that the sample selection and data collection plans were feasible a small pilot study was carried out. Nine THR patients were recruited with seven volunteering to participate. One of the two who did not participate was extremely anxious and asked the investigator to return several times. The fourth time the investigator returned the patient had been sedated.

The other patient was first contacted by the investigator at approximately 8:15 P.M. This was too late for her to begin the interview as the nursing staff on this patient's floor began surgical preparations at 8:30 P.M.

Prior to the beginning of the pilot data collection the investigator met separately with both the Director of Rehabilitation Services and the Chief Physical Therapist. Both expressed support for this research. However they both felt that the physical therapy staff could not realistically be expected to collect any information in addition to what they routinely noted at the end of a treatment session. Thus, predictions based on the number of repetitions of certain exercises (e.g. straight leg raises, isometric quad and gluteal setting exercises, and isometric abduction exercises) performed by patients were eliminated from the research design. Nor could physical therapists assess the range of motion of the hip on a daily basis using a goniometer.

The Chief Physical Therapist did agree to inform the physical therapists of the study of THR patients prior to the beginning of the pilot phase. This was done at a regular staff meeting attended by all the physical therapists. At this meeting the Chief informed the staff of the importance of accurate notes for the study as well as for provision of quality treatment. The method and scale for assessing level of functioning and the use of hall markers to measure distance ambulated (see

Assessment of Post-Operative Patient Behavior above) were both thoroughly reviewed. Staff physical therapists were not informed as to the specific hypotheses of the study.

The pilot study also provided an opportunity for the investigator to develop a working relationship with the Assistant Director of Medical Records who provided the medical records for data collection after the patients were discharged.

The pilot study was an important phase in the research as it allowed for several improvements in scheduling, the interview protocol, and the collection of data from the patients' medical records. Specifically, the 17 open-ended questions (see Qualitative Questions above) were reworded and refined as a result of the pilot study. Several were too lengthy for verbal administration in their original form. A few others were reported by patients to be ambiguous.

Patients also found it difficult to recall the four response choices during the administration of the verbal form of the Personal Views scale. To remedy this problem a sheet showing the response choices in extra-large type was provided to each patient to refer to when making his/her responses (see Appendix D). This technique had been successfully used by another investigator administering the verbal form to a population of

obstetrical patients (Feldman, 1986).

The twelve categories of Post-operative Complaints (see above) were developed based on a review of medical records of the patients in the pilot study. These twelve categories were of sufficient breadth to include all complaints offered by the final sample. The pilot review of patient medical records also demonstrated that caregivers, particularly physical therapists, reliably entered patient care notes in the medical records following consistent standards and formats.

During the pilot study it was determined that patients could most easily and least disruptively be recruited and interviewed between 12:30 P.M. and 8:00 P.M.

Interview

Once a patient had volunteered to participate the procedure described below was followed.

First, the patient was asked if he/she would prefer to be interviewed in his/her room or in the solarium. Ninety per cent of the patients choose to be interviewed in their rooms. Second, if there were any visitors present the investigator asked if he could come back when they had gone. This request was made, rather than asking the visitors to leave, in order to disrupt the patient's preoperative stay as little as possible. In most cases this resulted in only a ten or fifteen minute delay, or the investigator returned after interviewing another

patient. If a caregiver (physician or nurse) entered during the recruitment or interview the process was briefly halted. The investigator then introduced himself to the caregiver (if necessary) and offered to come back to continue the interview. In only one case, out of 17, did the caregiver accept this offer. In all other cases the caregiver allowed the investigator to remain while a few brief questions were asked (usually by a physician) or while vital signs were checked (usually by a nurse). While the role of the investigator had been carefully explained, patients accepted him as a member of the caregiving team and did not in any way appear uncomfortable with his presence during these brief caregiver visits.

The interview protocol, which was developed a priori, field tested and refined during the pilot study, was then followed (see Appendix D). The protocol was designed to provide the structure for the administration of the verbal form of the Personal Views scale, followed by a relaxed conversation of approximately 45 minutes duration. The conversation included the 17 open-ended questions discussed above and was to yield codable data to enable qualitative interpretations of quantitative data, (i.e. differences in and relationships among hardiness scores, level of physical functioning, length of stay, and demographic characteristics). At the same

time, every attempt was made to keep the atmosphere relaxed and relatively informal so as not to heightened the patient's anxiety during the preoperative period.

The administration of the verbal form of the Personal Views scale went smoothly and was largely unremarkable. Occasionally a patient would ask something along the lines of "What are you getting at?" or "Am I giving the right answers?". Several patients also noted that items within the scale are in a number of instances repetitious. A few patients mentioned that they couldn't see how these items could possibly be related to their surgery.

Patients often followed a response to one of the open-ended questions with a question to the investigator. This occurred most frequently after question 4 "Can you tell me in your own words what is wrong with your hip?" Patients who questioned the investigator after this question wanted to know if their understanding was correct. The investigator's response was that it was generally correct (which it always was) but they should ask their surgeon if they wanted a clearer or more detailed understanding. Some patients were puzzled that the investigator found it necessary to ask question 6 "Why did you decide to have the hip replacement?" Most thought the need for the operation was self-evident. When asked question 17 "Do you have any questions for me about this study?", very few

patients made inquiries. Those that did simply questioned whether the investigator believed the research might really benefit others in the future.

The investigator closed the interview by thanking the patient and wishing him/her a speedy recovery.

Immediately after leaving the patient's room, the investigator completed the "Post-Interview Notes" (Appendix D). This was a brief outline on which the investigator noted the patient's general appearance, whether any visitors were present prior to the interview, observable behaviors (finger tapping, fidgeting, etc.), affect, any background information that had been mentioned, and anything else of interest that had occurred during the time spent with the patient.

Review And Collection Of Data From Patient Medical Records

The investigator reviewed the medical record of each patient to collect data concerning the patient's post-operative complaints, behavior, level of physical functioning, and demographic and descriptive characteristics (see descriptions above).

The intense effort required during the recruitment and interviewing phase of this research precluded reviewing any patient medical records before these activities were completed. The phase of this study involving the review and collection of data from patient

medical records took place between January 16, 1987 and October 15, 1987. In accordance with the agreement reached with the Assistant Director of Medical Records during the pilot study, each week the investigator submitted a list of approximately ten patient names to the medical records clerk assigned to the study. Three to five business days later the clerk would have gathered which ever of the patient medical records requested that were presently in the Department's files. Usually, only three to six of the requested records were available. A record could be unavailable for any one of a number of reasons including: it was on "hold" waiting for a caregiver to complete or sign notes; it was being audited; the patient was scheduled for a follow-up visit and the record had been sent to the attending surgeon's office or the clinic; the record was being reviewed as part of another research project; the record had been requested by another caregiver or hospital providing follow-up care or other treatment to the patient; the attending surgeon had requested that the record be maintained in his office; or the record was temporarily misplaced.

By October 15, 1987 the records of four of the patients who had participated in the study could not be located. Of the remaining 56 records, four could not be reviewed for data collection purposes. Of these, two had insufficient treatment notes entered by the physical

therapists, and two contained some patient notes which were labeled with another patient's medical record number and name. In all probability, the clerk placing blank notepaper in these last two charts had simply used the wrong patient card (similar to a credit card in appearance) to label the notepaper. However, since this could not be proven to be the case these two patients were removed from the final sample. This left a final sample of 52 patients.

Each patient's medical record was reviewed by the investigator. A data collection sheet (developed during the pilot study) was used to code and organize data culled from the patient records.

Collection Of Demographic And Descriptive Data

The following information was collected from the standard face sheet (actually 2 pages in length) at the beginning of each record: age, ethnicity, religion, marital status, insurance coverage, occupation, primary and secondary diagnoses, post-operative complications, and length of stay. The first six items were completed by the Admitting Staff based upon information provided by the patient. The remaining three items were completed by the Director or Assistant Director of Medical Records. Diagnoses and post-operative complications were determined and coded based upon a review of the physician's assessment and diagnosis, patient care notes,

and the Medicare DRG classification system.

Each of the items recorded from the face sheet was cross-checked against information in other parts of the chart (e.g. medical history, social service notes, physician's admitting orders, physician's discharge summary, nursing discharge summary).

Collection of Post-Operative Patient Behavior and Level of Physical Functioning Data

The physical therapists' treatment notes were reviewed (beginning with the first post-operative day) to obtain data concerning post-operative patient behavior and level of physical functioning. If a treatment session did not occur on a post-operative day the reason for this was noted and coded accordingly. Selected treatment behaviors (as described above) were progressively introduced into the treatments by the physical therapists, in accordance with the treatment protocol (Appendix B). As the physical therapists notes indicated the addition of behaviors to the treatment session, the level of functioning and/or quantity performed for each was noted and coded by the investigator. As described previously, physical therapists rated level of functioning on a four point scale (0 - 3). On occassion therapists would use the adjective corresponding to a numerical point on the scale (e.g. "independent" for 0, "minimal assistance" for 1) rather than the number itself. In these instances the

investigator recorded the appropriate number on the data collection sheet. If a physical therapist requested that a patient perform a particular behavior and the patient refused this was coded a "4" for "Did not attempt/Refused".

For quantity of behavior performed, only the physical therapists notes were relied upon rather than including similar information which may also have been recorded by the primary nurses. For instance, the primary nurses would often note the number of times a patient was out of bed, went to the rest room, and/or ambulated down the hall. In the last instance, an estimate of the distance ambulated was also often included. This information was omitted as it was not reported using a consistent format and was based on patient self-reports and random observations by the nurse. Thus, data on post-operative patient behavior and level of functioning was collected only in relation to what took place in the physical therapy session.

The one exception to this was "hi-chair sitting". Once the physical therapist had shown the patient how to enter and leave the chair, this behavior was often omitted from the actual treatment session. This one behavior was regularly and consistently reported by nurses. Often the nurses reported hi-chair sitting occurring on more than one occassion during a single day. To assess level of functioning, the hi-chair sitting

(reported by either the physical therapist or nurse) of longest duration on a given day was recorded and coded (see Appendix G).

Collection Of Post-Operative Complaint Data

Each patient's medical record was reviewed to identify the number of times the patient offered a post-operative complaint or concern regarding his/her health, treatment, or emotional feelings to any member of the caregiving team. Complaints were coded into one of twelve categories that had been identified and defined during the pilot study (see above). For the purposes of this study the caregiving team included: attending surgeon; attending or consulting internist; residents and interns; any other physician who had occassion to treat or assess the patient during the post-operative period; registered nurses; physical therapists; social workers; nutritionists; and occupational therapists. All of these professionals are required by a number of laws, regulations, and policies to enter a note in a patient's medical record whenever he/she offers a complaint in any one of the twelve categories of interest.

Discretionary care (e.g. back rubs, skin care, and medications ordered "prn") not specifically requested by the patient as a remedy for a complaint was not taken as an indication of a complaint. Only notations that memorialized a patient's verbal complaint were coded as

complaints. If the same or a similar complaint was offered to several caregivers, the comment to each individual caregiver was recorded as a separate complaint. Frequently, a caregiver upon hearing a complaint from a patient would request another caregiver to assess or care for the patient. For instance, if a patient complained to his/her nurse of chest pain the nurse would request the attending internist to assess the patient. A complaint would be recorded based on the attending internists assessment notes, only if the notes specifically mentioned that the patient offered the complaint to the internist.

As described above, in each of the twelve categories separate counts were kept for complaints offered to physician caregivers versus non-physician caregivers. Due to the difficulties inherent in establishing a reliable and valid system for doing so, no attempt was made to record the magnitude of the complaints patients offered. Therefore, patient complaints of mild, moderate and severe pain or other discomfort were all recorded with equal weight. This is of course a significant limitation on the study.

Medical Record Interpretation

The investigator was able to read and interpret the medical records fairly independently due to his more than seven years prior experience reviewing and recording in patient medical records. This experience includes: one

year's experience as an intern at a large state hospital; two year's as Director of Emergency Health Services for a large municipality with responsibility for auditing the medical records of patients receiving emergency paramedical treatment; two years as clinical and administrative coordinator of an adolescent day treatment facility; and two years as clinical and administrative director of an emergency psychiatric intervention service.

Overall, the quality of the patients medical records was extraordinarily high. However, there were still instances where information was somewhat ambiguous. In most cases ambiguity was the result of poor handwriting or unfamiliar abbreviations. For instance "SLR" was used by one physical therapist to represent "Straight Leg Raise". This is a very simple exercise usually not commented on separately from other exercises in the treatment notes. In instances where assistance was required to interpret a medical record note the expertise of a number of health professionals was relied upon. This included the Chief Physical Therapist of another large urban hospital. This individual had more than five years of clinical experience prior to the conceptualization of the study. He is a faculty member in a graduate program in physical therapy and an officer in his state's chapter of the American Physical Therapy

Association. He is also conducting research in his own field. He provided invaluable assistance in selecting the appropriate population to study and in identifying concerns and issues throughout its conduct. A second physical therapist also provided insights into the post-operative physical therapy of THR patients during the design of the study as well as consultation on medical record interpretation during the data collection phase. She has three years experience in an acute care hospital and two years experience in private practice. A registered nurse provided information and guidance on pre and post-operative nursing care as well as the reliabilty and interpretation of nursing notes. She has some six years experience in providing medical/surgical care in acute care hospitals and two years experience providing postoperative home-care.

The attending rheumatologist who sponsored the study at Hospital X reviewed the theoretical underpinnings, hypotheses and research prior to both the pilot phase and the actual conduct of the research. He provided invaluable insight and support throughout the process. He is an Associate Professor of Medicine at a major medical school, in private practice, and an experienced researcher in addition to being an attending physician at Hospital X.

Data Compilation And Analysis

All data were entered in raw form from the data collection sheets into a computerized database. All data entry was done personally by the investigator. Five types of data records were developed and used to construct the data base for each patient. These were: Type 1 - Demographic & Descriptive Data; Type 2 - Diagnoses; Type 3 - Post-Operative Complications; Type 4 - Post-Operative Patient Behavior; and Type 5 - Responses To The Personal Views Scales. Each line of data included the patient's medical record number for identification purposes.

Data compilation and analysis was performed using SPSSX run on the VAX/VMS Version V4.4 computer system at the Graduate School and University Center of The City University of New York. The data analysis plan and flow-chart were developed by the investigator with the advice of his advisor and dissertation committee. The SPSSX programs were written by the investigator with technical assistance provided by two computer programmers/consultants. Each of the SPSSX sub-programs as well as the final complete program were verified on a test data set for five patients in the pilot study. The data set was checked for completeness and accuracy by both the investigator and the computer programmers/consultants both visually and by running test programs.

CHAPTER THREE

DATA ANALYSIS METHODS AND RESULTS

Demographic and Descriptive Data for the Sample

Demographic data were collected from the medical records of the patients participating in the study sample. The age of subjects ranged from 28 to 82 years of age with a mean of 64.86, a mode of 68.00, and a median of 66.50. The 28 year-old was an unusual admission in that the next youngest member of the sample was 46 years of age. The sample was fairly evenly split across sex with 24 male subjects and 28 female subjects. Subjects reported their religious affiliations as follows: Jewish = 26; Protestant = 8; Roman Catholic = 16; and Agnostic or None = 2. Reported marital statuses were: Married = 39; Divorced = 5; Never Married = 3; and Widow = 5. All of the subjects included in the sample reported their race as Caucasian.

The occupations of subjects and their spouses were classified according to ten categories. The breakdown of subject and spouse occupations is reported in Table III - 1.

Occupation	# Of Subjects	# Of Spouses
Executive	8	6
Professional	20	12
Technical	2	0
Self-Employed	2	1
Homemaker	9	14
Semi-skilled	2	1
Farmer	1	1
Secretary	8	0
Unknown	0	14

Table III - 1:
Subjects' And Spouses' Occupations

In terms of education, subjects reported the highest degree received. All subjects had completed high school with thirty (30) subjects reporting their high school diploma as the highest degree received. Eighteen (18) reported a B.S. or B.A. as the highest degree completed. Four (4) subjects held graduate degrees.

All subjects included in the study sample had active health care insurance coverage. This is a clear indication that the study sample is not representative of the patient population which receives medical care at major urban hospitals and medical centers. It is well documented that this population contains a substantial number of individuals who are working but have no health care insurance coverage or who are indigent and not

currently receiving public assistance or Medicaid coverage. Table III - 2 summarizes the distribution of both public and private insurance carriers providing coverage to the members of the study sample.

Insurance Type/Carrier	# Of Subjects
Medicaid & Medicare	1
Blue Cross/Blue Shield (BC/BS)	5
Other Private Carrier	6
Medicare Plus BC/BS	18
Medicare Plus Other Private	6
Medicare Plus BC/BS Plus Other Private	4
BC/BS Plus Other Private	12

Table III - 2:
Distribution Of Insurance Types/Carriers

The subjects total hip replacements (THRs) were performed by a total of ten (10) orthopaedic surgeons who are attending physicians at Hospital X. The range of the number of operations performed by the surgeons was from one (1) to sixteen (16). Two surgeons who performed 15 and 16 surgeries respectively accounted for a total of 59.6% of the Total Hip Replacements.

The number of prior surgical procedures subjects reported over their life-times ranged from zero (0) to six (6) with a mean of 1.654, a mode of 0.000, and a median of 1.000. Patients reported being hospitalized from zero (0) to five (5) times over the previous 18

months with a mean of .308, a mode of 0.000, and a median of 0.000.

Subjects reported the first noticeable onset of the degeneration of their hips as being from one (1) to thirty (30) years prior to the decision to undergo surgery with a mean of 7.087, a mode of 10.00, and a median of 5.500 years. The descriptive statistics for subjects' hardiness scores were compared to those for a group of several hundred subjects from two studies conducted in Chicago. One study was of business executives and the other of bus drivers (Ouellette/Kobasa, 1989). These comparisons are presented in Table III - 3 below.

Descriptive Statistic	Study Sample	Chicago Sample
Mean	100.327	72.49
Median	103.000	N/A
Mode	104.000	N/A
Minimum	57.000	N/A
Maximum	119.000	N/A
Range	62.000	N/A
Std. Dev.	11.616	12.27

Table III - 3:
Comparison Of Descriptive Statistics For Hardiness Scores From Study Sample To Chicago Sample

As can be seen from a review of Table III, the mean hardiness score for the present sample is some 27.837

points higher than that for the comparison group. This is yet another strong indication that the subject population is atypical.

Data Analytic Methods And Results Of Hypothesis Testing

As outlined in Chapter One, five specific hypotheses are tested in this research.

Hi-hardy patients when compared to lo-hardy patients will:

1. More actively engage in post-operative physical therapy;
2. Demonstrate a higher level of physical functioning prior to discharge;
3. Manifest fewer post-operative medical complications;
4. Spend fewer days in the hospital;
5. Express fewer verbal complaints.

The dependent variables used to test hypotheses 1, 2, and 5 (above) were selected from a review of the relevant literatures, discussions with physicians, physical therapists, and nurses who regularly treat patients who have undergone THRs, and the pilot study reported in Chapter II. As the data analyses and results are reviewed, we will see that many of the dependent variables did not present enough variability (at least in the current sample) to provide for the statistical testing of the hypotheses.

The length of the post-operative stay varied widely

across the sample (minimum = 7; maximum = 36). To control for this variability the data analyses for all dependent measures recorded on a daily basis were based on the period Day 0 (operative day) through Day 7. Therefore, for each of the "daily" dependent measures analyses were conducted on the mean of a total of eight scores for each subject. These means are referred to as the "8 day means".

Hypothesis 1:

Hi-hardy patients when compared to lo-hardy patients will more actively engage in post-operative physical therapy.

The dependent variables chosen to test this hypothesis were:

1. DAW the distance ambulated with the walkerette (measured in linear feet).
2. DALC the distance ambulated with Lofstrand crutches (measured in linear feet).
3. DSTAIR the number of times the patient climbed a practice flight of stairs in the daily treatment session.

The descriptive data for these three dependent variables are reported below in Table III - 4.

Depend Var.	8 Day Mean	Median	Mode	Min.	Maximum	Range	Std. Dev
DAW --	66.67	53.75	36.25	2.50	236.25	233.75	47.23
DALC -	37.02	32.19	0.00	0.00	156.25	156.25	34.61
DSTAIR	0.30	0.00	0.00	0.00	2.00	2.00	0.45

Valid Cases = 52

Table III - 4:
Descriptive Data For Dependent Variables For Hypothesis 1.

The mode for both DALC and DSTAIR is 0.00 indicating that a substantial number of subjects did not engage in these two types of behavior (crutch walking and stair climbing) by the seventh post-operative day (POD7). The frequency distribution and histogram for DALC (see Appendix F) show that 21.15% of the sample (or 11 subjects) did not engage in crutch ambulation by POD7. Further, 55.76% of the sample (29 subjects) did not engage in stair climbing by this benchmark. By contrast 100% of the sample engaged in walker ambulation by POD7.

According to the treatment protocol at Hospital X patients were brought to the rehabilitation gym to practice stair climbing only when they were judged to be within two to three days of discharge. Therefore, patients had a very minimal amount of control over their ability to engage in this rehabilitative exercise while in the hospital. Given this and the fact that such a large number of subjects did not have the opportunity to engage in stair climbing prior to POD7, STAIRD was

discarded as a reliable dependent variable and not included in any further analysis.

Pearson Correlation Coefficients were calculated between hardiness scores and DALC and DAW. The resulting correlation coefficients revealed that hardiness did not correlate significantly with DAW as predicted ($r = .0755$, $p = .297$). Hardiness was only marginally related to DALC ($r = .2132$, $p = .065$). Further, DAW and DALC were significantly, highly correlated ($r = .7210$, $p = .000$). Therefore, only a very minimal amount of support for Hypothesis 1 was provided by the results of the correlations.

Hypothesis 2:

Hi-hardy patients when compared to lo-hardy patients will demonstrate a higher level of physical functioning prior to discharge.

The six dependent variables originally selected to test this hypothesis were:

1. DISCOD the discharge code reported on the patient's chart. The patient's discharge disposition is decided upon by the surgeon in consultation with the social worker, physical therapist, and nurse. A patient is discharged according to his/her ability to function independently, the prognosis for increased improvement, and the degree to which support is available in his/her home. Four types of discharges were recorded for patients in the study sample. From

the discharge disposition providing least to most independence and worst to best prognosis these were: home with family; home with health aide; rehabilitation center; and home under self-care.

2. OOB the physical therapist's rating (0 - 4) of the patient's level of functioning in transferring out of bed.
3. LFW the physical therapist's rating (0 - 4) of the patient's level of functioning in ambulating with the walkerette.
4. LFLC the physical therapist's rating (0 - 4) of the patient's level of functioning in ambulating with the Lofstrand crutches.
5. LFHC the assigned score of the patient's ability to tolerate sitting (i.e. level of functioning) in the high chair.
6. LFSTAIR the physical therapist's rating (0 - 4) of the patient's level of functioning in stair climbing.

The DISCOD data is categorical in nature as opposed to the incremental data (based on rating scales) for the remaining five dependent variables. The frequency distribution for DISCOD is presented in Table III - 5, below.

DISCHARGE CATEGORY	VALUE	FREQUENCY	PERCENT
Home With Family	1	2	3.8
Home With Health Aid	2	1	1.9
Rehabilitation Center	3	2	3.8
Home Self-Care	4	47	90.4
	Total	52	100.0

Table III - 5:
Frequency Distribution For Discharge Code (DISCOD)

Examining the frequency distribution for DISCOD we see that 90.4% of the subjects in the sample were discharged to "home self-care". This leads to two major considerations. First, there is insufficient variability in the subject's scores on this dependent variable to perform statistical tests of the relationship between hardiness and patient post-operative functioning. Therefore, the variable DISCOD was not included in further analysis. Second, this points (as did the data on health care insurance, above) to the conclusion that the study sample is not a true representation of the population of patients being treated in urban medical centers.

As was pointed out above in the discussion of DSTAIR, patients were not able to choose freely to engage in stair climbing prior to the physical therapist's decision to take them to the gym. Therefore, as was the case with DSTAIR, LFSTAIR was discarded from the set of

dependent variables to be analyzed. The descriptive data for the remaining set of 4 dependent variables are presented in Table III - 6, below.

Dep. Var.	8 Day Mean	Median	Mode	Min.	Max.	Range	Std Dev
OOB	2.06	2.12	2.12	0.50	3.12	2.62	.524
LFW	1.53	1.50	1.50	0.25	2.87	2.62	.664
LFLC	0.63	0.56	0.00	0.00	2.75	2.75	.617
LFHC	0.92	0.75	0.50	0.00	2.62	2.62	.656

Valid Cases = 52

Table III - 6:
Descriptive Data For Five Dependent Variables For Hypothesis 2.

Pearson Correlation Coefficients were calculated between hardiness and day 8 means for the remaining set of four dependent variables (OOB, LFW, LFLC, LFHC). Only LFHC was found to be correlated with hardiness at even a marginal level of significance ($r = -.1909$, $p = .088$). Further, contrary to my prediction, LFHC correlated negatively with hardiness.

Therefore, no evidence was found that supported Hypothesis 2.

Hypothesis 3:

Hi-hardy patients when compared to lo-hardy patients will manifest fewer post-operative complications

Only one dependent variable, the total number of complications reported during the complete post-operative stay (TOTCOMP), was used to test this hypothesis. The

descriptive data for TOTCOMP are presented in Table III - 7.

Dependent Variable	Mean	Median	Mode	Min.	Max.	Range	Std Dev
TOTCOMP	1.69	1.00	1.00	0.00	10.00	10.00	1.566

Valid Cases = 52

Table III - 7:
Descriptive Data For TOTCOMP For Hypothesis 3.

Examining the frequency distribution and histogram for TOTCOMP (see Appendix F) one finds that there is an extremely limited amount of variability in the recorded number of complications reported across subjects. In fact, 65.38% of the sample (34 subjects) were reported to have experienced one post-operative complication. In addition, only one subject was reported to experience no post-operative complications. There appeared to be some kind of systematic bias entering into the recording of patient post-operative complications (see Chapter IV for a discussion of the possible sources of this bias). Therefore, this variable was abandoned as appropriate for use in testing Hypothesis 3. As it was the only variable relevant to this hypothesis, any attempt to test it was abandoned.

Hypothesis 4:

Hi-hardy patients when compared to lo-hardy patients will spend fewer days in the hospital.

The dependent variable chosen to test this hypothesis was the length of stay post-operatively (LOSPO). This was defined as the number of days spent in the hospital following the day that the THR was performed. For all patients, the day on which the patient was discharged was counted in the LOSPO. The descriptive data for the subjects reported LOSPOs are presented in Table III - 8.

Dep. Var.	Mean	Median	Mode	Min.	Max.	Range	Std Dev
LOSPO	11.17	10.00	10.00	7.0	36.0	30.00	4.431

Valid Cases = 52

Table III - 8:
Descriptive Data For LOSPO For Hypothesis 4.

To adjust the LOSPO to reflect the length of the total hospital stay (as opposed to the post-operative stay) 2 days are added to a subject's LOSPO; one day for the day of admission and one day for the operative day. Therefore, the mean length of the total hospital stay would be 13.17 (11.17 {$\bar{X}$ LOSPO} + 2). This is 1.23 days less than the national mean stay of 14.4 days calculated for DRG 0209 - Major Joint Procedures, under which THRs fall. This is yet a third indication

(together with health care insurance coverage and discharge code) that the study sample is not representative of the population electing to undergo THRs.

The Pearson Correlation Coefficient was calculated between hardiness and LOSPO. The results indicated a very strong relationship, in the predicted direction, between hardiness and LOSPO ($r = -.3021$, $p = .015$).

One subject's LOSPO was 36.0, some 16 days higher than the next lowest LOSPO of 20. This suggests that the outlier score might be due to some source of error not attributable to the sampling technique alone, which may be distorting the correlation coefficient. A Winsorization technique was used (Winer, 1971) and the correlation coefficient recalculated, to control for this potential bias. The results showed no appreciable difference in the magnitude of the correlation or the level of significance reached.

A series of two hierarchical multiple regressions was performed to control for the effects of sex, age, and total number of diagnoses a patient had been assigned (as a gross measure of overall health). In the first regression, sex was entered into the equation first since it is well documented that the health care system treats women in significantly different ways than it does men (e.g. women are more likely to receive prescriptions for

drugs such as diazepam and are more likely to be diagnosed with certain psychiatric and physical disorders). Age was entered second as: 1) older patients in relatively poorer health have been found to have longer LOSPOs (Shaffer, 1984); and 2) age and hardiness were found to be marginally, negatively correlated ($r = -.1798$, $p = .10$). The results of the first multiple regression are presented in Table III - 9.

Variable	R Square	F	Sign. F	Beta	T	Sig T
SEX	.04508	2.36039	.1308	.212320	1.536	.1308
AGE	.06510	1.70615	.1922	.142717	1.024	.3106
HARDINESS	.14070	2.61973	.0615	-.279500	-2.055	.0454

Table III - 9:
Summary Of The Results Of The Hierarchical Multiple Regression Performed To Assess The Predictability Of LOSPO Based On Hardiness While Controlling For Sex And Age.

The results of the first hierarchical multiple regression indicate that hardiness is a significant predictor of LOSPO after the effects of sex and age are controlled. Further, the relationship between hardiness and LOSPO is negative as predicted. Neither sex nor age appear to have a significant relationship to LOSPO.

In the second multiple regression, sex was again entered first. The total number of diagnoses a patient had been assigned (TOTDX) was entered second. The more diagnoses a patient has the poorer his/her relative

health may be; this should lead to a corresponding increase in his/her LOSPO. This was supported by the significant correlation found between TOTDX and LOSPO ($r = .4987$, $p = .000$. Also, TOTDX and hardiness were found to be significantly, negatively correlated ($r = -.3298$, $p = .008$). Age was entered third, as it theoretically should have a smaller and less direct impact on LOSPO than TOTDX. The results of the second multiple regression are summarized in Table III-10 below.

Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.04508	2.36039	.1308	.212320	1.536	.1308
TOTDX	.28328	9.68348	.0003	.488096	4.035	.0002
AGE	.28379	6.33992	.0010	.023578	0.186	.8536
HARDINESS	.30372	5.12549	.0016	-.150444	-1.160	.2520

Table III - 10:
Summary Of The Results Of The Hierarchical Multiple Regression Performed To Assess The Predictability Of LOSPO Based On Hardiness While Controlling For Sex, Total Number Of Diagnoses, And Age.

The results of the second multiple regression analysis indicate that the total number of diagnoses a patient has been assigned (TOTDX) is the best predictor of LOSPO. After the total number of diagnoses has been entered, the equation predicting LOSPO is not significantly improved by taking hardiness into account. Again, sex and age do not appear to significantly add to the predictability of LOSPO.

Hypothesis 5:

Hi-hardy patients when compared to lo-hardy patients will express fewer complaints.

The dependent variable used to test Hypothesis 5 was the eight day mean of the total number of complaints offered from Day 0 through Day 7 (TOTCOM8M). This was the sum of complaints across all complaint indicators. Separate counts were kept for complaints to physicians versus non-physician caregivers for each of the twelve complaint types identified in the pilot study (see Chapter 2). Thus, there were 24 complaint indicators (12 complaint types X 2 categories of complaint recipients). The separate counts were kept in consideration of the difference in power and other attributes inherent in the physician role versus other caregiver roles (see Chapter I, above).

Two indicator variables were also calculated in order to compare complaints offered to physicians versus non-physicians. These indicator variables were:

A. NONDRS8M the eight day mean of the total number of complaints offered to non-physicians from Day 0 through Day 7 (summed across the 12 complaint types relevant to non-physicians).

B. DRS8M the eight day mean of the total number of complaints offered to physicians from Day 0 through Day 7 (summed across the 12 complaint types relevant to physicians). The descriptive data for the

dependent variable (TOTCOM8M) and the physician (DRS8M) and non-physician (NONDRS8M) complaint variables are summarized in Table III - 11.

Dependent Variable	8 Day Mean	Med.	Mode	Min.	Max.	Range	Std Dev
TOTCOM8M	2.49	2.19	2.12	0.12	7.25	7.12	1.508
DRS8M	0.24	0.12	0.00	0.00	1.12	1.12	0.281
NONDRS8M	2.24	2.00	1.87	0.00	6.25	6.25	1.367

Valid cases = 52

Table III - 11:
Descriptive Data For The Dependent Variable And Physician/Non-Physician Complaint Variables For Hypothesis 5.

The most striking aspect of the descriptive data reported in Table III - 11 is the magnitude of the difference in the number of complaints offered to non-physicians versus those offered to physicians. In terms of the mean number of total complaints offered, patients are 9.33 times more likely to inform a non-physician of a complaint than they are to inform a physician ($\bar{X}$ NONDRS8M = 2.24 vs. $\bar{X}$ DRS8M = 0.24). While varying in magnitude this relationship is consistent across the four categories of complaints included in the analysis (OC - emotional, TI - fatigue, DZ - dizziness, and OPPA - surgical pain).

A series of two-tailed t-tests were run to determine whether or not these differences in the means are statistically significant. The results of these t-tests

(see Tables H - 1 through H - 6 in Appendix H) show that the difference between the mean of complaints offered to physicians and the corresponding mean of complaints offered to non-physicians was significant for all five comparisons (see dependent variable complaint types 2 through 11 above) at a level of $p < .01$.

One problem evident in comparing the number of complaints offered to physicians versus non-physicians is the fact that, generally, more non-physicians come in contact with a patient on a daily basis than do physicians. To control for this a second set of t-tests were run with the mean number of complaints offered to non-physicians divided by three for each complaint type. The decision to divide the non-physician means by three was reached after reviewing a dozen randomly selected charts from the study sample and consulting with the Chief Physical Therapist and Registered Nurse who provided technical assistance for the research. The chart review and discussions indicated that patients have approximately two to three more opportunities to talk with non-physicians in an atmosphere that would be conducive to voicing their complaints. The results of this second set of t-tests showed that the difference in means for four of the six comparisons made, were still significant at a level of $p < .05$ (see Tables H - 7 through H - 12, Appendix H). The comparisons still proving significant were those for total number of

complaints offered to physicians versus non-physicians; emotional complaints; complaints of fatigue; and complaints of pain from the surgical procedure or healing process. Pearson Correlation Coefficients were calculated between hardiness and the dependent variable TOTCOM8M (the eight day means of all patient complaints) as well as the physician (DRS8M) and non-physician (NONDRS8M) complaint variables The results, summarized in Table III - 12, show that TOTCOM8M and DRS8M were marginally significantly correlated with hardiness. Both of these were negatively correlated as predicted. NONDRS8M was not significantly correlated with hardiness.

	NONDRS8M	DRS8M	TOTCOM8M
HARDINES	-.1616	-.2078	-.1851
	(52)	(52)	(52)
	P= .126	P= .070	P= .095

Table III - 12:
Pearson Correlation Coefficients For Hardiness With Eight Day Means Of All Patient Complaints And Complaints Offered To Physicians Versus Non-Physicians.

Using logic similar to that used when analyzing the LOSPO data, hierarchical multiple regressions were performed to control for the effects of sex, total number of diagnoses a patient has been assigned, and age on TOTCOM8M and DRS8M. Sex was entered first, again due to the documented differences in the way males and females are treated by the health care system. The total number

of diagnoses was entered next under the belief that the more ailments a patient has the more likely he/she is to offer complaints. Again, age was entered third given that older patients in relatively poorer health require longer treatment, which may indicate they require and receive closer monitoring by caregivers. The results of these two multiple regressions are summarized in Table III - 13.

Dependent Variable: TOTCOM8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.02734	1.40564	.2414	.165361	1.186	.2414
TOTDX	.05416	1.40299	.2556	.163779	1.179	.2442
AGE	.10128	1.80313	.1592	-.225795	-1.586	.1192
HARD-INESS	.12604	1.69455	.1671	-.167678	-1.154	.2544

Dependent Variable: DRS8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.06896	3.70321	.0600	.262597	1.924	.0600
TOTDX	.11302	3.12196	.0529	.209939	1.560	.1251
AGE	.13981	2.60062	.0628	-.170254	-1.223	.2274
HARDINESS	.16431	2.31019	.0716	-.166778	-1.174	.2464

Table III - 13:
Summary Of The Results Of The Hierarchical Multiple Regressions Performed To Assess The Predictability Of TOTCOM8M & DRS8M.

The results of these regressions indicate that when certain sources of variability (sex, total number of diagnoses, and hardiness) are entered into the equation, none significantly adds to the prediction of either the total number of complaints offered (TOTCOM8M), or the total number of complaints offered to physicians (DRS8M).

Based on the research in the area of the patient/caregiver relationship (see Chapter One) eight of the individual complaint types (4 categories of complaint X 2 categories of complaint recipient) were thought to be more likely, than the others, to vary as a function of hardiness level. These together with the three summary counts of patient complaints (see definitions below for TOTCOM8M, NONDRS8M, and DRS8M) brought the number of dependent (one) and indicator variables (10) included in the statistical tests to 11.

The abbreviations and definitions for these additional eight indicator variables are as follows:

- o OCDR8M the eight day mean of the total number of emotional complaints (e.g. depressed, sad, anxious) offered to physicians from Day 0 through Day 7.
- o OC8M the eight day mean of the total number of emotional complaints offered to non-physicians from Day 0 through Day 7.

- o TIDR8M the eight day mean of the total number of complaints of fatigue or tiredness offered to physicians from Day 0 through Day 7.
- o TI8M the eight day mean of the total number of complaints of fatigue or tiredness offered to non-physicians from Day 0 through Day 7.
- o DZDR8M the eight day mean of the total number of complaints of dizziness or light headedness offered to physicians from Day 0 through Day 7.
- o DZ8M the eight day mean of the total number of complaints of dizziness or light headedness offered to non-physicians from Day 0 through Day 7.
- o OPPADR8M the eight day mean of the total number of complaints of pain from the surgical procedure or the healing process offered to physicians from Day 0 through Day 7.
- o OPPA8M the eight day mean of the total number of complaints of pain from the surgical procedure or the healing process offered to non-physicians from Day 0 through Day 7.

Descriptive data for the eight indicator variables above are summarized in Table III - 14, below.

Dependent Variable	8 Day Mean	Median	Mode	Min.	Max.	Range	Std Dev
OCDR8M	0.04	0.00	0.00	0.00	0.37	0.37	0.094
OC8M	0.21	0.12	0.00	0.00	1.12	1.12	0.267
TIDR8M	0.01	0.00	0.00	0.00	0.25	0.25	0.038
TI8M	0.21	0.12	0.00	0.00	1.00	1.00	0.258
DZDR8M	0.03	0.00	0.00	0.00	0.50	0.50	0.095
DZ8M	0.11	0.00	0.00	0.00	0.75	0.75	0.182
OPPADR8M	0.04	0.00	0.00	0.00	0.37	0.37	0.089
OPPA8M	1.06	1.06	1.12	0.00	2.87	2.87	0.685

Valid Cases = 52

Table III - 14:
Descriptive Data For Complaint Indicator Variables For Hypothesis 5.

It should also be noted that these eight indicator variables are highly intercorrelated with each other as well as with the other two indicator variables (DRS8M AND NONDRS8M) and the dependent variable (TOTCOM8M). Among the 55 intercorrelations generated for these variables 33 were significant at the $p = .05$ level or less and 6 were marginally significant at the $p = .10$ or less (see Appendix G). Only one (TIDR8M) of the indicator variables is not significantly correlated with TOTCOM8M (the eight day mean of all patient complaints). This raises the issue of whether or not these indicator variables, in fact, measure meaningful different types of patient behavior. This is discussed in Chapter 4, below.

Pearson Correlation Coefficients were calculated

between hardiness and the eight day means of patient complaints for each of the above eight complaint indicator variables. The results, summarized in Table III - 15, show that only three of these indicator variables were significantly correlated with hardiness (i.e. DZDR8M, TIDR8M, and OC8M). A fourth indicator variable (TI8M) was marginally correlated with hardiness. All four of these were negative correlations as predicted.

	OPPA8M	OPPADR8M	DZ8M	DZDR8M
HARDINESS	-.0539	-.1303	-.0658	-.3856
	(52)	(52)	(52)	(52)
	P= .352	P= .179	P= .322	P= .002

	TI8M	TIDR8M	OC8M	OCDR8M
HARDINESS	-.1819	-.2633	-.3030	-.1168
	(52)	(52)	(52)	(52)
	P= .098	P= .030	P= .014	P= .205

Table III - 15:
Pearson Correlation Coefficients For Hardiness With Eight Patient Complaint Indicator Variables.

Using logic similar to that used when analyzing the LOSPO data, hierarchical multiple regressions were performed to control for the effects of sex, total number of diagnoses a patient has been assigned, and age on the four patient complaint indicator variables which correlated significantly with hardiness (i.e. DZDR8M, TI8M, TIDR8M, and OC8M). Sex was entered first, again

due to the documented differences in the way males and females are treated by the health care system. The total number of diagnoses was entered next under the belief that the more ailments a patient has the more likely he/she is to offer complaints. Again, age was entered third given that older patients in relatively poorer health require longer treatment, which may indicate they require and receive closer monitoring by caregivers. The results of the four multiple regressions are summarized in Table III - 16.

Dependent Variable: DZDR8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.00056	0.02821	.8673	-.023747	-0.168	.8673
TOTDX	.00309	0.07598	.9269	-.024377	-0.171	.8650
AGE	.00344	0.05529	.9827	-.019518	-0.130	.8969
HARDINESS	.16025	2.24230	.0786	-.421990	-2.711	.0093
Dependent Variable: TI8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.00030	0.01522	.9023	-.017444	-0.123	.9023
TOTDX	.00047	0.01146	.9886	.012785	0.090	.9290
AGE	.01207	0.19556	.8989	.112067	0.751	.4563
HARDINESS	.04393	0.53985	.7072	-.190189	-1.251	.2170
Dependent Variable: TIDR8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.00237	0.11886	.7317	.048698	0.345	.7317
TOTDX	.01113	0.27574	.7602	-.093591	-0.659	.5131
AGE	.05745	0.97521	.4122	.223873	1.536	.1311
HARDINESS	.14095	1.92790	.1214	-.307937	-2.137	.0378
Dependent Variable: OC8M						
Variable	R Square	F	Signif F	Beta	T	Sig T
SEX	.00005	0.00246	.9607	-.007008	-0.50	.9607
TOTDX-	.22051	6.93093	.0022	.469573	3.723	.0005
AGE	.27627	6.10768	.0013	-.245622	-1.923	.0604
HARDINESS	.30989	5.27629	.0014	-.195399	-1.513	.1369

Table III - 16:
Summary Of The Results Of The Hierarchical Multiple Regressions Performed To Assess The Predictability Of DZDR8M, TI8M, TIDR8M & OC8M.

The results of the multiple regressions indicate that, controlling for the effects of sex, total number of diagnoses, and age, hardiness is a significant predictor of low-magnitude for complaints to physicians of both dizziness and fatigue. While the magnitude of hardiness as a predictor is low, none of the other three variables add significantly to the prediction of these two types of complaints. The multiple regression for emotional complaints offered to non-physicians presents a different picture. Here, the total number of diagnoses is the best (though moderate in strength) predictor of complaints. Once the effect of the total number of diagnoses is accounted for, neither the patients age or hardiness level significantly improve the predictability of emotional complaints.

The results of the regression analysis for the indicator variable of patient complaints of fatigue to non-physicians (TI8M) indicate that when other sources of variance are controlled for, hardiness does not add to the prediction of complaints of fatigue.

CHAPTER FOUR

DISCUSSION, CONCLUSIONS & FUTURE DIRECTIONS

SUMMARY

We should consider the hypothesis testing itself before looking at how well hardiness predicted response to total hip replacement (THR) in hypothesis testing. Only two of the five hypotheses could be tested as originally proposed, due to the nature of the data obtained on the outcome variables. These two were the fourth and fifth, which predicted that hi-hardy patients would spend fewer days in the hospital and express fewer verbal complaints.

The remaining three hypotheses could not be tested as proposed because of the following reasons. Testing hypothesis three (that hi-hardy patients would manifest fewer post-operative complications) had to be completely abandoned because of the extremely low number of complications reported. The testing of the remaining two hypotheses, one having to do with engagement in post-operative physical therapy and the other with functioning prior to discharge, was significantly altered. Indicators of response to surgery had to be dropped in both cases. In testing engagement in therapy, only distance ambulated with the walkerette and distance ambulated with crutches could be considered. There were too few subjects sufficiently engaged in stair climbing to include this in the statistical analyses. In testing

the relationship between hardiness and level of functioning prior to discharge, two kinds of indicators were unusable. The use of type of discharge plan as an indicator of response was lost completely because essentially all subjects went home to independent self-care. The second kind of level of functioning indicator, that based on therapists' ratings, was altered to include only four of the five therapists' ratings originally selected (therapists' ratings of stair climbing were dropped).

Looking at the results of the two hypotheses tested as fully as originally planned, one sees weak and conditional support for the predictive power of hardiness. The hypothesized connection between hardiness and length of stay is supported through simple correlational analysis: the hardier the total hip patient, the fewer days spent in the hospital post-operatively. This relationship remains essentially intact as one examines it through a regression analysis which controls for the effects of sex and age upon days in hospital. However, closer scrutiny of the relationship forces one to qualify the statement about the relevance of hardiness. Although after controlling for the demographic characteristics of sex and age in regression analyses, one still sees the significance of hardiness as a predictor; adding the number of diagnoses

upon admission to the list of controls changes the picture. Controlling for number of diagnoses serves to eliminate the significance of hardiness as a predictor. In other words, hardiness contributes nothing to our ability to predict how long one will stay in hospital above and beyond that based on total number of diagnoses.

The second hypothesis tested as initially planned, that hardiness would be negatively related to complaints, was only marginally supported. The correlations between hardiness and total number of complaints and that between hardiness and number of complaints made to physicians approach but do not reach adequate levels of statistical significance in the predicted directions. There are only trends suggesting that hardier patients present fewer complaints. When hardiness is examined while controlling for age, sex, and diagnoses at admission, its influence upon complaints fails to emerge at all.

Looking at the results of the two hypotheses given at least a partial test, one finds weak if any support for the predictive power of hardiness. In testing the hypothesis that hardy patients more actively engage in treatment, one sees that only distance ambulated with Lofstrand crutches is related to hardiness ($r = .21$, $p = .065$). Hardiness is not correlated with distance ambulated with a walker. Using what remains as indicators of patients' functioning prior to discharge, i.e., physical therapists' ratings, there is no support

for the hypothesis that hardy patients demonstrate a higher level of functioning.

In short, at least as conceptualized for this study, hardiness has a qualified relationship to length of stay in hospital following surgery, a marginal relationship with complaints made during hospitalization and engagement in physical therapy, and none of the expected positive relationship with general functioning prior to discharge. I will review the limitations under which the study was conducted, before discussing the implications of these results.

LIMITATIONS OF THE STUDY

Unique Socio-Economic Characteristics Of The Sample

The sample population is not representative of the general population undergoing THRs and other surgical procedures. First, there are indications that the members of this sample had an unusual amount of social support available to them. Only 9.61% of the sample had ever been divorced, which is substantially below the national incidence of divorce in the United States. In addition, only 9.61% and 5.76% of the sample reported their marital status as widowed or divorced (respectively). Further, during the qualitative interviews 51 of 52 subjects reported that they had ample opportunity to discuss the THR with family and/or friends; and would be able to rely (to one degree or another) on them during the post-

operative period. Over half of the subjects had visitors in their rooms when I went to interview them and all but a few patients expected guests later in the day. About 20% of the subjects had family members or companions who intended to stay with them throughout visiting hours (11 A.M. through 9 P.M.) on both the pre-operative and operative days. Taken together, these facts strongly suggest that the subjects had a uniquely high degree of social support available to them on an on-going basis.

Second, the educational level of the sample also appears extraordinarily high. Every subject completed high school and 22 had college or graduate degrees. This takes on added significance when one considers that over half of the subjects were school age during the depression years when completing one's education should have been especially difficult. Related to this is my anecdotal impression that the subjects were, again with one exception, highly literate. This impression is based on the fact that only one subject had a problem understanding the consent form, questions, or instructions. In addition, while the specific purpose of the study was not disclosed to them, many made some rather insightful "guesses" as to how the results might be used. I would also regard the typical subject's vocabulary as extremely well-developed. Compare this to the recent data that suggests some 44 million Americans are functionally or marginally illiterate and you have

another strong indication of this sample's uniqueness.

While data regarding subject income were not available, other data suggests that the subjects' economic status was atypically high. First, 28 of the subjects and 18 of their spouses reported occupations that fell into either the executive or professional categories. Only 2 subjects and 1 spouse reported occupations categorized as semi-skilled. In addition, the two subjects who were categorized as self-employed indicated during their interviews that their incomes were in the "six figure" range. The subject and spouse who were categorized as farmers actually owned and ran a rather large produce farm. Half of the eight subjects who were categorized as secretaries functioned as executive secretaries. Executive secretaries in the metropolitan New York labor market typically earn $40,000 or more per year. Second, only one subject relied solely on public health insurance (i.e. Medicaid or Medicare). All other subjects had one or more forms of private health insurance coverage. Finally, a review of the interview data shows that over three-fourths of the subjects mentioned the fact that they owned their own homes, co-ops, or condominiums.

In sum, the apparently high-level of socio-economic resources typically available to the subjects who participated in this study severely limits our ability to

generalize the findings reported. As the literature cited in Chapter One suggests (e.g. Sutherland, et al, 1952; Bard & Sutherland, 1978; Wortman, 1984; and Kobasa & Puccetti, 1983) these socio-economic resources are likely to have increased their ability to cope with the stress of the THR. In turn, they may have been able to progress more rapidly during the post-operative period than the general population of patients undergoing THRs. This may account,in part, for the lack of variability found in several of the dependent variables.

Subjects' Hardiness Level

As was pointed out in Chapter Three the subjects in this study scored much higher than those in a comparison group of business executives and bus drivers. In fact, only four of the subjects in this study scored less than one standard deviation above the mean score of the comparison group (see Appendix F). While truly normative data on the Personal Views Scale is not available, this indicates that the majority of this study's subjects were "hi-hardy". Considering this, an alternative to the conclusions that hardiness does not have an impact on patient's level of functioning or treatment engagement is possible. The results may indicate that once a certain threshold has been crossed, increased hardiness does not contribute to higher functioning or treatment engagement. This might be particularly true where subjects have available a great

deal of socio-economic resources. A hardy personality style has been found to interact with socio-economic resources to improve coping (e.g. Kobasa & Puccetti, 1983).

The Healthcare System And Hospital X

A major premise of this research is that while hospitalized, hi-hardy patients can exercise a moderate degree of control over their treatment and personal behavior (e.g. accelerate their pace through the post-operative protocol; increase the distance ambulated during treatment sessions). In retrospect, I question whether or not this was a reasonable assumption. In Chapter One, I reviewed the traditional patient/caregiver relationships and roles in medical care, highlighting the fact that the healthcare system acts to limit the control of the patient and increase the control of the caregivers. In Chapter Three, I noted that several dependent variables had to be eliminated from the analyses. Two of these (DSTAIR and LFSTAIR) were discarded because the treatment protocol precluded patients from engaging in certain exercises prior to a given post-operative day.

The enactment of the Prospective Pricing System for hospital reimbursement may have created other sources of bias. This system may be seen as increasing the pressure on caregivers to control patient behavior (e.g. limit

complications and discharge prior to the established average length of stay). I did not perform the analysis of the relationship between hardiness and patient complications because 65.38% of the subjects were reported to have one complication. The PPS allows a higher reimbursement for patients who have at least one complication. I believe that it is entirely possible that the definition of "complication" has now been cast in economic rather than medical terms, as a result of these new healthcare economics.

In addition to these general considerations of the healthcare system, Hospital X is a very specialized hospital. It primarily treats patients with arthritic and orthopaedic diseases and traumas. Treatment protocols and regimens may be far more refined than at a general hospital. This may further limit the amount of control patients have since the staff is likely to be more confident and self-assurred than would be a staff that infrequently treats a patient with a THR. I would think that patients are less likely to pose questions or exert control in a situation where the caregivers are highly confident.

Given all of the above, the hypotheses considered in this study might more productively be tested in a design which includes an intervention to increase the opportunity for patients to exert control.

Measurement Issues

This study relied on the data which are normally collected and recorded by caregivers. The only alterations in the usual procedures were to inform the physical therapists that: a study was underway, accurate notes would be critical to the conduct of the study, and distance ambulated should be carefully recorded using hall markers. The methods and scales normally used in Hospital X for assessing level of functioning were also reviewed.

The data I collected were from the periods when patients were being treated by a healthcare professional. These were the times when patient behavior was under the closest supervision and control. What could not be collected was data on patient behavior when they were functioning independently in their rooms, the solariums, and the hallways. If data could be collected when patients were functioning independently I believe we would find more variability in patient behavior. This in turn would provide a more valid test of the hypotheses I have developed here.

There are a number of ways this type of data could be collected. Patients could be asked to keep daily logs. I rejected this approach in designing my study because of the well-documented problems with self-report data of this nature and because of the priority I placed on limiting disruptions during the patient's hospital

stay.

Alternatively, the technology exists to monitor patient movement in a non-obtrusive way. This can be done using integrated activity monitors. These are small, light movement recorders which can be attached to a patient's ankle with a comfortable, non-restricting velcro strap. These devices have been used successfully to study the behavior of patients who have undergone coronary-bypass surgery (Kulik and Mahler, In Press). I could not include them in this study because of their cost.

As I will discuss below, I believe the results of this study provide ample justification for undertaking research which makes somewhat greater demands on caregivers and patients in order to collect better data and includes the cost of using new technology such as the activity monitors.

IMPLICATIONS

Overall, I believe that, although modest, the results reported here support the continued investigation of the relationship between hardiness and response to disease (i.e. post-operative recovery). I also believe that they have some other important implications concerning: 1) recasting some assumptions about the physician-patient and non-physician-patient relationships; and 2) the conduct of

psychological/behavioral research in highly specialized medical centers.

Hardiness, Total Number Of Diagnoses, And Length Of Stay

I predicted that hi-hardy patients would spend fewer days in the hospital following their THRs. As reported above, I did find that hardiness and length of stay are significantly, negatively correlated ($r = -.3021$, $p = .015$). However, subsequent regression analyses found that the best predictor of length of stay is the patient's total number of diagnoses. Once the total number of diagnoses has been entered, hardiness does not significantly improve the equation predicting length of stay.

I do not believe that this is an indication that hardiness is not an important predictor of length of stay and post-operative recovery. Rather, I think this evidence should lead us to reconsider our notion of how hardiness impacts patient behavior and recovery. Consider first the work on hardiness and its moderation of the stress-illness relationship (see Chapter One). Specifically, look again at the model supported by the work of Kobasa and Puccetti (1983; see Figure 3). This model implies that hardiness moderates the degree to which stressful life events produce illness throughout one's life. Assume that "lo-hardy" subjects in this study have been characteristically so, throughout their lives. Then based on the Kobasa and Puccetti model we

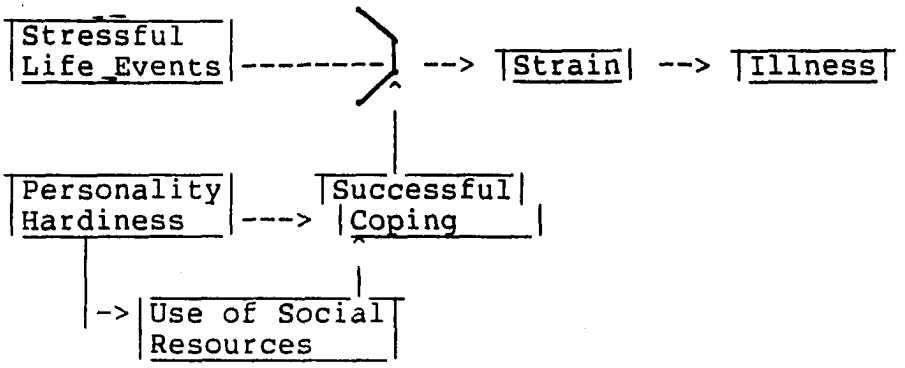


Figure 3.
Hardiness, Social Resources, and The Stress-Resistance Process
(Kobasa & Puccetti, 1983)

would expect them to be hospitalized for a THR with more ailments (diagnoses) than relatively "hi-hardy" patients. It is accepted doctrine that patients with more diagnoses will have a more difficult time recovering from a specific illness or surgical procedure. Based on this I conclude that hardiness may indeed have an impact on patient behavior and post-operative recovery but the effects of this are felt long before the hospitalization or surgery takes place. (This has led me to reconsider my model, as discussed below.)

If this is the case then interventions to increase patient hardiness may have limited usefulness in the short-term. Patients would have to be hardier for a period long enough to improve their overall health (i.e. reduce the number of ailments they suffer from) in order

to improve their recovery from any single health event. Should this prove to be true, "hardiness training" would still be an important intervention to include in the treatment of patients undergoing procedures such as the THR. Once a THR has been performed maintaining/improving the patient's total health becomes essential. This is particularly true where the patient is young enough at the time of the THR for it to be likely that the joint will have to be replaced a second time during the patient's lifetime (see Chapter One).

An important ethical and economic issue also emerges here. What are the responsibilities of caregivers and institutions to provide treatment interventions that do not substantially improve recovery from the present ailment but may have long-term benefit to the persons involved? This is a particularly important question when the healthcare providers in our nation are now compensated, in large part, under a system (PPS) that rewards only efficient, short-term treatment. A system that discourages any activity which might increase the length of a patient's hospitalization inhibits caregivers from giving more comprehensive care which might lead to better long-term health for the patient as well as decreased medical costs.

Hardiness And Patient Communication Of Complaints

I predicted that hi-hardy patients would express fewer complaints. The results of the analyses provide some support for this hypothesis. I found a marginally significant relationship between hardiness and the eight day mean of all patient complaints (TOTCOM8M). It was in the predicted negative direction ($r = -.1851$, $p = .095$). The modest strength of this relationship indicates, as expected, that many other variables (e.g., the caregiver's personality, caregiver-patient interaction, etc.) influence the frequency with which patients offer complaints.

As reported above, I also ran a series of correlations between hardiness and ten indicator variables which were individual types or sub-categories of complaints. Three of these yielded significant results in the predicted direction. Hardiness was found to be negatively related to complaints of dizziness and fatigue to physicians and emotional complaints to non-physicians. Hardiness continued to be the best predictor of patient complaints of dizziness and fatigue (to physicians) when the effects of sex, total number of diagnoses, and age were controlled for in regression analyses. Regression analysis revealed that hardiness did not contribute to the prediction of emotional compliants (to non-physicians) when the total number of

diagnoses was accounted for in the analysis. I interpret the last finding using the same logic I applied to the results of the regression analyses of hardiness, age, sex, and total diagnoses as predictors of length of stay. That is, the effect of total diagnoses masked the effects of hardiness which impacted the patient long before this particular hospitalization.

Taken together, I believe these results indicate that when patients express different kinds of complaints they may actually be exhibiting distinct kinds of behavior. They are complaining with a different intent and different expectation or in response to different cues from the recipient of the complaint. These individual differences explain why post-operative pain was the only category of complaint where not even a marginally significant relationship was found for complaints to physicians or non-physicians.

Complaints of post-operative pain are likely the only specific type of complaint that are regularly cued by caregivers. Based on my experience and the concurrence of the registered nurse and physical therapists advising me, caregivers specifically begin asking patients if they have, or how much they have, post-operative pain immediately after surgery. This is perhaps the only complaint that all caregivers inquire about. They also inquire about it throughout most of the hospitalization. This cueing may neutralize any

differences in the amount of post-operative pain complaints that might otherwise appear in relation to hardiness.

Looking at the three significant relationships that were found, I would pose the following speculations. Lo-hardy patients may offer more complaints of fatigue and dizziness to physicians than to non-physicians because of the following differences in expectations and cues. Hi-hardy patients expect to be fatigued since they are working at rehabilitating themselves. They in fact may welcome fatigue and mild dizziness as signs that they are indeed actively trying to progress. The lo-hardy patient in taking on the traditional sick role (see Chapter One) sees fatigue and dizziness as signs that they are being overly taxed. In addition, complaints of fatigue and dizziness are very much in keeping with the passive, dependent nature of patients in the traditional sick role.

Lo-hardy patients would be more likely to offer complaints of these types to the physician because of the cues physicians present to a greater extent than do non-physician caregivers. When non-physician caregivers are with a patient they are, usually, actively trying to get the patient to engage in some type of behavior (e.g. exercise, hygiene, eating, etc.). Their role is to encourage patients to overcome fatigue and discomfort in

order to perform. In this sense non-physicians may be seen as less receptive to complaints of dizziness and fatigue than physicians. Post-operatively, physicians usually visit patients to check their status through a conversation and perhaps a brief examination. They do not typically cue the patient to exert themselves. Physician requests of the patient are generally limited to asking a patient to demonstrate how well he/she can flex a joint, take a few steps, etc. Such requests would usually not be made on a daily basis. Therefore, I suggest that physicians cue patients to express how they are doing in a way which is much more accepting of complaints of fatigue and dizziness.

If one accepts the reasoning that the total number of diagnoses masks a significant relationship between hardiness and emotional complaints to non-physicians, I would explain that relationship in the following way. Physicians may be perceived as, or send cues that they are, less receptive to complaints of an emotional nature. Again, this fits with my review of the traditional conceptualizations and findings on the physician-patient relationship (see Chapter One). Non-physician caregivers (e.g. nurses and physical therapists) may be more receptive to emotional complaints as they take a more wholistic view of the patient and treatment. In addition, complaints of an emotional nature may not be seen, by the non-physician, as an impediment to getting

the patient to engage in treatment. Contrast this to how complaints of fatigue and dizziness might be seen as part of the patient's resistance to engaging in treatment. The reasoning that different kinds of complaints are an expression of distinctly different behaviors might also help explain the significant difference in the frequency of complaints to physicians versus non-physicians. I see two possible explanations for this difference in complaint behavior. First, and perhaps more obvious, is the notion that patients complain more to non-physicians than physicians, because the former are perceived as less powerful (i.e. less threatening) and more receptive to patient communication. Alternatively, the converse could be true.

Non-physicians enter a patient's room with a specific task or set of tasks to accomplish. They have multiple patients to treat during the day and with whom they must accomplish these tasks. This instrumental orientation may lead the patient to perceive the non-physician as more difficult to engage in conversation. Therefore, the patient may send more cues (i.e. complaints) that he/she wants to engage in communication. Compare this to the typical post-operative physician visit. The physician's primary tasks that aren't "conversation focused" (i.e. reviewing the patient's chart and writing new orders) are performed outside of

the patient's room. When with the patient the physician seeks to generate conversation (albeit often brief) as a means of assessing the patient. Therefore, the patient may offer less cues (complaints) signaling a desire to engage in conversation; because they are not needed.

It also seems plausible that hi-hardy and lo-hardy patients might interpret the environment, roles, and cues differently. Therefore, both of the above patterns of behavior could be taking place. Hi-hardy patients might offer more complaints to non-physicians as they attempt to increase engagement with those they may perceive as the primary caregivers. Lo-hardy patients might offer more complaints to non-physicians because they see them as less threatening and more receptive.

While the results of my analyses of the frequency of patient complaints leads to some interesting notions, the current study does not permit me to be more than speculative. Research of a much different and more comprehensive nature is required to develop and test these notions. A major issue with the current research is that it looked at only a small fragment of the patient-caregiver interaction. Glancing back at the descriptive data for the complaint variables (Table III - 9) shows how small a piece of the communication was really captured. For instance, the mode for the eight day mean of eight of the eleven complaint types was 0.00. Complaints are simply not a frequent enough form of

communication (at least as normally reported in patient charts) from which to draw a full understanding of patient-caregiver communication and the moderating effects of variables such as hardiness.

Future work should include techniques such as transactional analysis, SYMLOG (Bales, Cohen, & Williamson, 1979) , and in-depth interviews with both patients and caregivers concerning the intent behind and context of their communications.

Implications Of Testing The Model Of Hardiness And Response To Disease Using A Unique Population

The unique characteristics of the sample population give greatest credence to my conclusions and speculations. Consider the research on the moderating effects of hardiness and social supports on the stress-illness relationship (see Chapter One) as well as the proposed models (Kobasa & Puccetti, 1983, Figure 3; Flanagan, Figure 4, below). If I had set out to select a sample population which had all of the characteristics which could possibly limit the effects of hardiness level on post-operative recovery, I would have come up with a sample very much like the one I used here. The subjects in this sample had substantially more social and economic resources than the general population. The variability in hardiness levels was limited to within a range above that which had been termed high in previous studies.

The subjects were treated in a very specialized facility. In addition, at the time of this study, Hospital X was seeking to improve the level of psycho-social care and research provided. In short, I found that even in a group of hi-hardy patients, with tremendous social and economic supports, the variation in hardiness may well have accounted for a considerable portion of the variation in length of stay. Again, even with this unique population I also found some results which lend insight into how patient-caregiver communication varies as a function of hardiness. This suggests to me that the effects of hardiness on post-operative behavior and recovery would have been significant and clear cut if tested on a truly representative population.

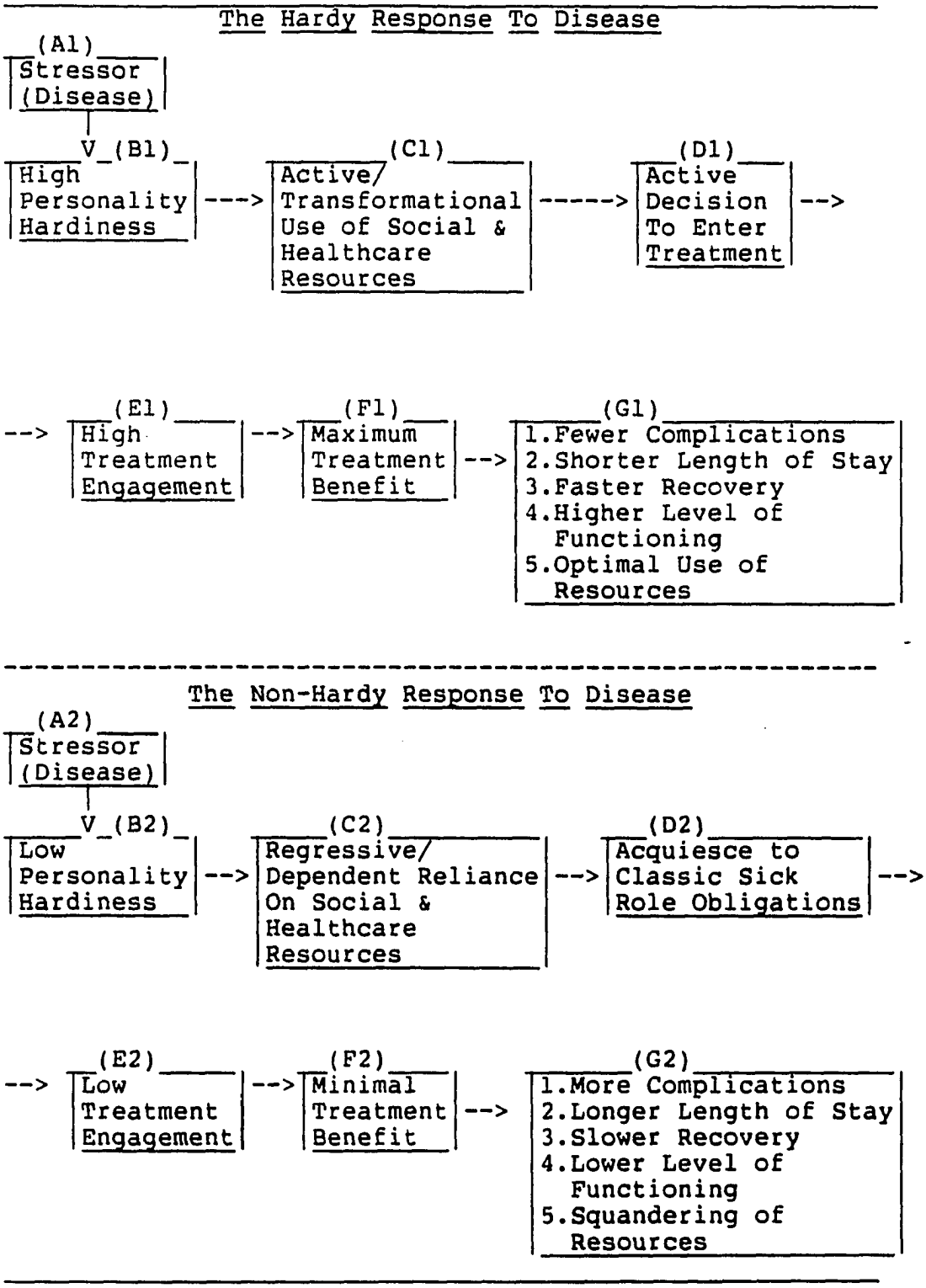


Figure 4.
The Hardy and Non-Hardy Responses to Disease

I would also suggest that this study lends some insight into the appropriateness of specialized versus general hospitals for different kinds of research. Specialized hospitals which typically treat patients of unusually high socio-economic status (i.e. Hospital X) may present the optimum environment for clinical investigations of a physiological/surgical nature. In effect these studies performed in such an environment would control for the effects of variations in socio-economic and possibly some personality variables.

Conversely, specialized hospitals with patients of unusually high socio-economic status may be a poor choice for the study of social and psychological theories. These unique patient populations have so many social and economic resources available, that the effects of any particular variable (e.g. hardiness) may be hidden. For instance, my original model (Figure 4) proposes that high hardiness moderates the degree to which social and healthcare resources are utilized in response to disease. If these resources are available in exceptionally high amounts than even poor utilization may lead to highly positive outcomes.

I elected to conduct this study at Hospital X because as a hospital specializing in orthopaedic diseases it performed a large number of THRs annually, the surgical procedures are conducted with greater expertise and consistency, and the staff was highly

supportive of my work. While this choice greatly expedited the conduct of the study, it also severely limits my ability to generalize my findings. The characteristics of Hospital X and the sample population may also account for the minimal support the data provided for my hypotheses.

Reconsidering The Models Of Hardy And Non-Hardy Responses To Disease

In view of the results of this research I would add one additional component to each of the models of hardiness and response to disease. This component would consist of the residual advantages (hi-hardy) or disadvantages from prior effects of the individuals hardiness level (see *1 and *2, Figure 5). These residual influences would moderate the hardy individual's ability to actively use social and healthcare resources (C1, Figure 5). In the case of the lo-hardy individual, these influences would moderate the degree to which he/she exhibits regressive/dependent reliance on social & healthcare resources (C2, Figure 5). This is consistent with the finding that total number of diagnoses is a better predictor of length of stay (positive relationship) than is hardiness (negative relationship). I attributed the former relationship to a higher incidence of diagnoses among lo-hardy patients which in turn masked the relationship between hardiness and length of stay.

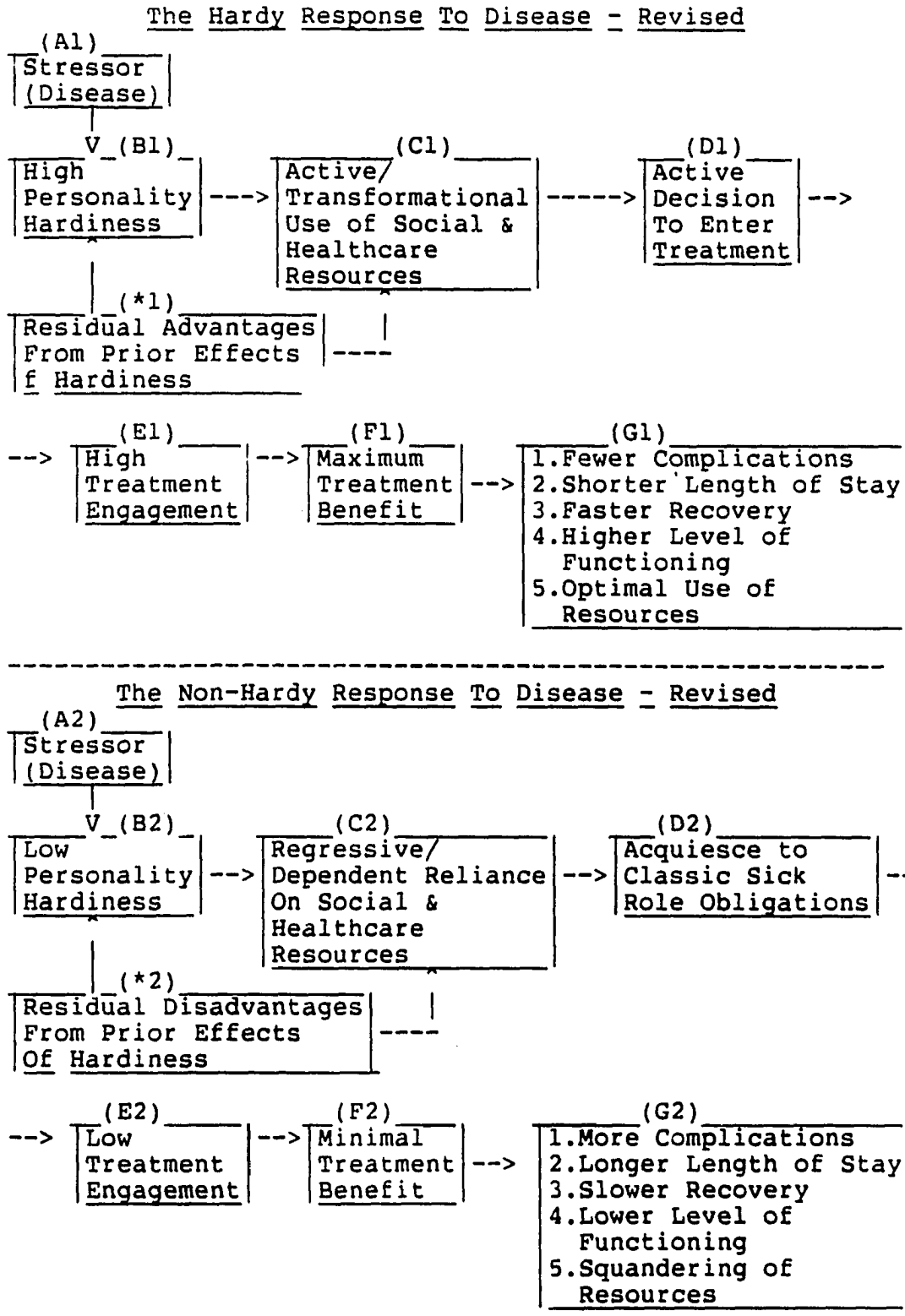


Figure 5.
The Hardy and Non-Hardy Responses to Disease - Revised

Under the revised model, hi-hardiness keeps one in a higher state of general health (i.e. fewer diagnoses) and therefore indirectly augments one's ability to cope with the onset and treatment of disease. Further, this effect actually comes into play long before a given disease or treatment (i.e. THR) begins. Better health is a residual advantage from long-term hi-hardiness. Conversely, lo-hardiness leads to a lower state of general health (i.e. more diagnoses) and therefore indirectly increases the likelihood that one will adopt a regressive/dependent reliance on social & healthcare resources (i.e. cope ineffectively). Again, this effect may be felt long before the actual beginning of the illness or treatment. Poorer health is, therefore, a residual disadvantage from long-term lo-hardiness.

In addition to moderating coping and the use of social and healthcare resources, the residual advantages or disadvantages would moderate the individual's current level of hardiness. For example, suppose an individual has consistently engaged in "hardy behavior" in response to a number of stressors. However, these stressors are so overwhelming that no response can significantly moderate their impact. Over time, this pattern of stressor, hardy response, and negative result could cause one's hardiness level to drop. This might just be the course of events experienced by a young, inner-city, minority adolescent. He/she may have been socialized

during childhood years to be hardy but now finds adequate socio-economic resources (e.g., housing, education, healthcare, and employment) out of reach.

It is important to emphasize that my model seeks only to predict the response to certain types of diseases. Specifically, these are diseases which are chronic but not life-threatening in nature. Further, the disease must be one where entering medical treatment is objectively the most efficient and beneficial course for the patient to take at some point. My model also assumes that the disease is not precipitated by psychological or psycho-physiological factors (although they may affect the disease course and level of symptoms after onset).

If my model were to apply to diseases in general, it would have to include additional components and interactions. For instance, "residual influences" would also be seen as modifying the onset of stressors/diseases. To apply to life-threatening or terminal illnesses the hardy response would have to include the possibility of the individual actively deciding not to enter treatment. Such a decision might be made in order to avoid the pain, physical debilitation, and loss of dignity that usually accompanies traumatic yet often unsuccessful treatments for diseases such as the cancers.

CONCLUSION AND FUTURE DIRECTIONS

In conclusion, one of the five hypotheses derived from my models of the hardy and lo-hardy responses to disease was supported with qualifications by the results of this research. A second hypothesis was marginally supported with the results presenting some interesting implications for our understanding of patient/caregiver interaction. The data also support the importance of looking at the unique characteristics of the population under study (i.e. unusually high socio-economic resources and extremely high hardines scores) as well as the treating hospital (i.e. private, orthopaedic) which may have biased the results in such a way as to mask the effects of hardiness on the dependent variables studied. This research lead to the improvement of the models of hardiness and disease by including a component composed of the residual effects of hardiness as a moderator in situations prior to the specific disease/treatment under study. This is a significant contribution, as it should lead researchers investigating the relationship between hardiness and disease to take a more longitudinal perspective accounting for prior life experiences and coping.

The suggestion was made that research on social and psychological theories should, preferrably, not be performed in specialized healthcare facilities. Such facilities often treat a unique population which may bias

results and limit the generalization of findings.

Finally, we saw very clearly that patients complain more frequently to non-physician caregivers than to physicians. The implications of this are less clear. Clarity and understanding may be forthcoming if we start to consider individual types of complaints as being specific behaviors; with different stimulus and intent. This is suggested by the results of my analysis of hardiness and the frequency of different complaint types.

Future efforts should be improved in the following ways. First, the sample population should be drawn from a single large general hospital or from several facilities to assure that the sample is truly representative of the general patient population. Second, my models suggest that hardy patients will be more highly engaged in treatment than low-hardy patients, if given the opportunity. Given the nature of modern treatment and patient-caregiver relationships, future efforts should be focused around an intervention to increase the opportunity for patients to engage in treatment.

Third, the measurement techniques used should be more comprehensive in nature. I believe the results of this research justify the greater burden that this will place on patients and caregivers. Data culled from the usual patient records and a brief patient interview is simply not rich enough to test hypotheses and develop

theory around such a complex issue as patient behavior. In addition, future research should clearly be of a more longitudinal nature. While the post-operative stay following a THR is relatively brief, the recovery period is actually up to six months long, or longer. It is possible that the beneficial effects of hardiness may not be felt until later in the recuperative process.

APPENDICES

APPENDIX B

TOTAL HIP PROTOCOL

DEPARTMENT OF REHABILITATION MEDICINE
PHYSICAL THERAPY
AND
OCCUPATIONAL THERAPY

PRE-OP PT -Gross functional evaluation including ROM and muscle strength

-Coughing and deep breathing exercises

-Ankle exercises

-Isometric quad and gluteal setting exercises

-Instruct in post-op transfers

POD 1&2 PT -Deep breathing and coughing exercises

-Continue ankle exercises

-Review total hip precautions

-Head of bed can be raised to 60 degrees

POD 3&4 (or when Hemovac has been removed) PT

-Begin quad and gluteal sitting exercises

-Begin isometric abduction exercises (if trochanter has NOT been removed)

-Encourage exercises on non-operated leg.

-Review total hip precautions

-Head of bed can be raised to 75 degrees

POD 5 PT -Out of bed to standing

-Ambulation with walkerette, weight bearing as tolerated (if trochanter has been removed then partial weight bearing)

-Continue all exercises

-Order raised toilet seat from unit clerk.

-Review total hip precautions

-Head of bed can be raised to 75 degrees

POD 6 PT -Continue ambulation with walkerette

-Continue exercises

-Begin active knee flexion exercises in standing position

-Review total hip precautions

-Head of bed can be raised to 75 degrees

POD 7-9 PT -Continue ambulation with walkerette

-Begin sitting in high chair with hip flexion to 75 degrees

-Make sure that raised toilet seat has been placed in patient's room and instruct patient in its use

-Continue exercises

-Review total hip precautions

OT -Evaluate patient in terms of A.D.L. and equipment needs

POD 10&11PT -Continue ambulation with walkerette

-Continue active knee flexion exercises in standing position

-Begin active hip flexion and hip abduction exercises in standing position at the foot of the bed (only if the trochanter has NOT been removed)

-Review total hip precautions

POD 12-DC PT-Progress patient from walkerette to cane (if

trochanter has been removed, progress patient from walkerette to crutches)

-Continue all exercises

-Patient may begin sitting with hip flexed to 90 degrees

-Review total hip precautions

NOTE 1.Patients are usually discharged 2.5-3.0 weeks after surgery.

2.When patient is alert enough to understand and follow directions the non-operated leg may be removed from the abduction splint during the day.

3.When the patient begins ambulation, a pillow should be placed between the patients legs at all times when lying in bed. The abduction splint MUST be used during sleeping periods throughout the day, at night and when being turned in bed for nursing care.

4.A pillow should be used between the patient's legs at all times when lying in bed six weeks post-op.

5.Patients often ask many questions in reference to activities that cam be pursued after discharge, such as playing golf, swimming, etc. Patients should be instructed to ask their surgeons these questions during their first follow-up visit, which usually occurs 6 weeks after discharge.

APPENDIX C

PATIENT INFORMED CONSENT FORM

On the following two pages is the patient consent form used in this study with all information identifying Hospital X deleted. The form is reproduced here on two separate pages, when used in the study it was on a single sheet of paper, printed front and back.

CONSENT FORM FOR PARTICIPATION IN RESEARCH OR OTHER INVESTIGATION

1. **Nature of Study**

I have been informed of the following new study, procedure, development, demonstration, drug, or other investigation (hereafter referred to as the "research or investigation") which is summarized below; such summary includes a statement of the purposes of the research or investigation and identification of any procedures which are experimental:

The purpose of this study is to increase our understanding of how people cope with disease and medical treatment. The information you provide may help us to improve the quality of medical treatment for the benefit of others. Participation in this study is entirely voluntary. Whether or not you agree to participate will in no way affect the treatment you receive. If you agree to participate in the study we will ask the following. First, we will ask you to sign this consent form. Next a member of our research team will meet with you sometime before your operation. He/she will ask you to respond to the questions he/she reads from a brief questionnaire. Then he/she will spend a short time interviewing you. During the interview you will be asked a few questions concerning your problem with your hip, your decision to have surgery your experience as a patient, and your plans for the future. This conversatio will take between 45 minutes and an hour. Finally, we are asking your per mission to collect information from your medical record concerning your hospitalization and treatment.

2. **Potential Risks**

I have been informed of the following known hazards, effects, discomforts and foreseeable risks as regards physical, psychological, sociological, or other harm which may reasonably be expected to occur as a result of participation in this research or investigation:

We see no risk to you in participating in this study. The study does not involve any changes in the usual treatment provided to patients. All your medical records and research questionnaires are strictly confidential. Your name and other personal information will be known only to the research staff.

3. **Potential Benefits**

I have been informed of the following benefits reasonably to be expected to result from the research or investigation:

The purpose of this study is to increase our understanding of how people cope with disease and medical treatment. This may enable us to help future patients cope better with their illness and more effectively benefit from medical treatment. At the present time, no representation can be made that your participation will be directly beneficial to you.

4. Alternative Procedures
I have been informed of the following appropriate alternative procedures which might be advantageous to me:

The purposes of this study require that patients be interviewed and surveyed. No other research procedures can provide us with the necessary information. Once again, your participation in this study will in no way alter or affect the treatment you will receive.

I have been given the opportunity for full discussion of my participation with the investigator, and understand that it cannot be claimed that my participation will directly benefit me.

I voluntarily consent to participate in the above research or investigation with full knowledge of the possible effects or hazards involved, and with the further understanding that not all effects of the research or investigation are known.

I understand that I am free to withdraw my consent and to discontinue my participation in the research or investigation at any time without prejudice to me. I also understand that I am entitled to make any inquiries regarding any aspects of my participation which I do not understand. In addition, I understand that I will be informed of any new development that might affect my willingness to continue my participation in the research or investigation.

I understand that all reasonable efforts will be undertaken to maintain the confidentiality of my identity.

I am aware that The will not provide me with monetary compensation in the event that the research or investigation summarized in paragraph I above ("Nature of Study") results in physical injury to me, but that immediate medical care and treatment will be made available to me for which I will be financially responsible. I am also aware that I may obtain from the Hospital's Executive Director or Associate Executive Director additional information concerning the Hospital's policy on providing medical treatment in the event of such physical injury.

I understand that I will receive a copy of this consent form.

Signature of Individual or Guardian	Present Date
Address	Record Number

Statement of Investigator

I have offered to the individual whose signature appears above an opportunity for further explanation of his/her participation in the research or investigation.

Signature of Investigator	Present Date

APPENDIX D

INTERVIEW PROTOCOL

On the following 15 pages is a copy of the interview protocol used during the conduct of this study. Included are the following components:

- Face Sheet
- Post-Interview Notes
- The Verbal Hardiness Scale
- Interview Questions (qualitative)
- Large type response sheet

FACE SHEET

SUBJECT NO._____

PATIENT:_____

ADMISSION DATE:_____MEDICAL RECORD #:_____

ROOM #:_____DATE INTERVIEWED:_____

TIME INTERVIEWED:_____LENGTH OF INTERVIEW:_____

PHYSICIAN:_____AGE:_____D.O.B.:_____

PATIENT ADDRESS:_____

CITY:_____STATE:_____ZIP:_____

HARDINESS SCORES

RAW-SCORES		STANDARDIZED SCORES
COMMITTMENT:_____	DIVIDE BY 48	COMMITTMENT:_____
CHALLENGE:_____	DIVIDE BY 51	CHALLENGE:_____
CONTROL:_____	DIVIDE BY 51	CONTROL:_____
TOTAL:_____		SUM OF RATIOS:_____

SUM X 100 DIVIDED BY 3 = TOTAL STANDARDIZED:_____

TOTAL LENGTH OF STAY:_____ P.O.D. ONLY:_____

PRIMARY ADMITTING DX:_____

REVISED DX:_____DATE:_____

SECONDARY DX:_____DATE:_____

SECONDARY DX:_____DATE:_____

SECONDARY DX:_____DATE:_____

SECONDARY DX:_____DATE:_____

SURGICAL COMPLICATIONS NOTED:_____

NO. OF P/T TX@:_____
SUMMARY OF P/T NOTES:

PATIENT:
ADMISSION DATE:
MEDICAL RECORD #:

POST-INTERVIEW NOTES

GENERAL APPEARANCE:

FAMILY PRESENT? _____YES _____NO
Who?

OBSERVABLE BEHAVIORS:

AFFECT/MOOD:

BACKGROUND INFO:

OTHER NOTES:

PATIENT:_____

ADMISSION DATE:_____MEDICAL RECORD #:_____

HARDINESS AS A PREDICTOR OF INPATIENT TREATMENT & OUTCOME
INTERVIEW QUESTIONS

1. When did you first become aware that you had something wrong with your hip?

---

2. What was the first thing you noticed?

---

3. How soon after that did you first contact your physician?

---

4. Can you tell me in your own words what is wrong with your hip?

---

5. What's been the worst part of having this trouble with your hip?

---

6. Why did you decide to have the hip replacement?

---

7. Who did you discuss the operation with?

7A. Now that you are in the hospital is there anyone else you wish you had discussed the operation with? Who? Why?

---

8. What are you looking forverd to after you recover from the operation?

---

9. How long do you think it will be before you are fully recovered?

---

10. Have you ever had surgery before?

_____YES _____NO

For what?

---

11. What do remember about those other operations?

---

12. If you could give advice to someone else with a similar problem with their hip, what would it be?

---

13. What personal preparations did you make before you came into the hospital?

13A. Now that you are in the hospital is there anything you wish you had taken care of before you were admitted?

---

14. When did you schedule your operation?

---

15. Why did you schedule it for tomorrow?

---

16. What kind of person would you describe yourself as?

---

17. Do you have any questions for me, about this study?

THANK YOU VERY MUCH FOR PARTICIPATION!

0 = Not At All

1 = A Little

2 = Quite A Bit

3 = Completely

APPENDIX E

EQUIVALENCY CHART FOR HI-CHAIR SITTING LEVEL OF FUNCTIONING

Amount Of Time Spent In Hi-Chair (As Reported In Patient's Chart)	Code
60+ Minutes	0
30 - 59 Minutes	1
15 - 29 Minutes	2
1 - 14 Minutes	3
0 Minutes (Unable to sit)	0

APPENDIX F

FREQUENCY DISTRIBUTIONS

HARDINES: HARDINESS SCORES

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
57.00	1	1.9	1.9	1.9
72.00	1	1.9	1.9	3.8
79.00	1	1.9	1.9	5.8
80.00	1	1.9	1.9	7.7
86.00	2	3.8	3.8	11.5
87.00	1	1.9	1.9	13.5
89.00	2	3.8	3.8	17.3
93.00	1	1.9	1.9	19.2
95.00	2	3.8	3.8	23.1
96.00	4	7.7	7.7	30.8
98.00	2	3.8	3.8	34.6
99.00	1	1.9	1.9	36.5
100.00	2	3.8	3.8	40.4
101.00	1	1.9	1.9	42.3
102.00	2	3.8	3.8	46.2
103.00	4	7.7	7.7	53.8
104.00	5	9.6	9.6	63.5
105.00	3	5.8	5.8	69.2
106.00	1	1.9	1.9	71.2
107.00	3	5.8	5.8	76.9
108.00	2	3.8	3.8	80.8
109.00	1	1.9	1.9	82.7
110.00	2	3.8	3.8	86.5
112.00	1	1.9	1.9	88.5
113.00	2	3.8	3.8	92.3
115.00	1	1.9	1.9	94.2
117.00	2	3.8	3.8	98.1
119.00	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

HARDINES: HARDINESS SCORES (Continued)

COUNT	MIDPOINT	ONE SYMBOL EQUALS APPROXIMATELY .40 OCCURRENCES
1	58	***
0	61	
0	64	
0	67	
0	70	
1	73	***
0	76	
2	79	*****
0	82	
2	85	*****
3	88	********
0	91	
3	94	********
6	97	**********
4	100	**********
11	103	**********
7	106	**********
5	109	**********
3	112	********
1	115	***
3	118	********

I....+....I....+....I....+....I....+....I
0 4 8 12 16
HISTOGRAM FREQUENCY

MEAN	100.327	STD ERR	1.611	MEDIAN	103.000
MODE	104.000	STD DEV	11.616	VARIANCE	134.930
KURTOSIS	3.033	S E KURT	.650	SKEWNESS	-1.362
S E SKEW	.330	RANGE	62.000	MINIMUM	57.000
MAXIMUM	119.000	SUM	5217.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	98.000	66.67	105.000

VALID CASES	52	MISSING CASES	0

AGE: AGE

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
29	1	1.9	1.9	1.9
47	2	3.8	3.8	5.8
48	1	1.9	1.9	7.7
53	1	1.9	1.9	9.6
54	1	1.9	1.9	11.5
56	2	3.8	3.8	15.4
57	1	1.9	1.9	17.3
58	3	5.8	5.8	23.1
59	2	3.8	3.8	26.9
60	1	1.9	1.9	28.8
61	3	5.8	5.8	34.6
62	3	5.8	5.8	40.4
63	1	1.9	1.9	42.3
64	1	1.9	1.9	44.2
65	2	3.8	3.8	48.1
66	1	1.9	1.9	50.0
67	1	1.9	1.9	51.9
68	6	11.5	11.5	63.5
69	2	3.8	3.8	67.3
70	4	7.7	7.7	75.0
71	1	1.9	1.9	76.9
73	1	1.9	1.9	78.8
74	2	3.8	3.8	82.7
75	2	3.8	3.8	86.5
76	2	3.8	3.8	90.4
77	1	1.9	1.9	92.3
78	1	1.9	1.9	94.2
79	2	3.8	3.8	98.1
82	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

AGE: AGE (Continued)

COUNT MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES

```
     0         25
     1         28  *****
     0         31
     0         34
     0         37
     0         40
     0         43
     2         46  **********
     1         49  *****
     1         52  *****
     3         55  ***************
     6         58  ********************************
     7         61  ***********************************
     4         64  ********************
     8         67  ****************************************
     7         70  ***********************************
     3         73  ***************
     5         76  *************************
     3         79  ***************
     1         82  *****
     0         85
                I....+....I....+....I....+....I....+....I
                0         2         4         6         8
                      HISTOGRAM FREQUENCY
```

MEAN	64.865	STD ERR	1.364	MEDIAN	66.500
MODE	68.000	STD DEV	9.838	VARIANCE	96.785
KURTOSIS	2.214	S E KURT	.650	SKEWNESS	-.989
S E SKEW	.330	RANGE	53.000	MINIMUM	29.000
MAXIMUM	82.000	SUM	3373.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	61.000	66.67	69.333

VALID CASES	52	MISSING CASES	0

SEX: SEX

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
MALE	0	24	46.2	46.2	46.2
FEMALE	1	28	53.8	53.8	100.0
	TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .6 OCCURRENCES

```
   24    .00  ****************************************
   28   1.00  ****************************************************
             I.........I.........I.........I.........I.........I
             0         6        12        18        24        30
                       HISTOGRAM FREQUENCY
```

MEAN	.538	STD ERR	.070	MEDIAN	1.000
MODE	1.000	STD DEV	.503	VARIANCE	.253
KURTOSIS	-2.055	S E KURT	.650	SKEWNESS	-.159
S E SKEW	.330	RANGE	1.000	MINIMUM	.000
MAXIMUM	1.000	SUM	28.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	1.000

VALID CASES 52 MISSING CASES 0

RELIG: RELIGION

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
JEWISH	0	26	50.0	50.0	50.0
PROTESTANT	1	8	15.4	15.4	65.4
ROMAN CATHOLIC	2	16	30.8	30.8	96.2
AGNOSTIC OR NONE	3	2	3.8	3.8	100.0
	TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .6 OCCURRENCES

```
   26   .00  ******************************************
    8  1.00  *************
   16  2.00  ***************************
    2  3.00  ***
           I.........I.........I.........I.........I.........I
           0         6        12        18        24        30
                   HISTOGRAM FREQUENCY
```

MEAN	.885	STD ERR	.136	MEDIAN	.500
MODE	.000	STD DEV	.983	VARIANCE	.967
KURTOSIS	-1.280	S E KURT	.650	SKEWNESS	.497
S E SKEW	.330	RANGE	3.000	MINIMUM	.000
MAXIMUM	3.000	SUM	46.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	2.000

VALID CASES 52 MISSING CASES 0

MS: MARITAL STATUS

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
MARRIED	0	39	75.0	75.0	75.0
DIVORCED	1	5	9.6	9.6	84.6
NEVER MARRIED	2	3	5.8	5.8	90.4
WIDOW	3	5	9.6	9.6	100.0
	TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .8 OCCURRENCES

```
   39   .00  **************************************************
    5  1.00  ******
    3  2.00  ****
    5  3.00  ******
          I.........I.........I.........I.........I.........I
          0         8        16        24        32        40
                   HISTOGRAM FREQUENCY
```

MEAN	.500	STD ERR	.136	MEDIAN	.000
MODE	.000	STD DEV	.980	VARIANCE	.961
KURTOSIS	1.911	S E KURT	.650	SKEWNESS	1.819
S E SKEW	.330	RANGE	3.000	MINIMUM	.000
MAXIMUM	3.000	SUM	26.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES	52	MISSING CASES	0

RACE: RACE

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
WHITE	0	52	100.0	100.0	100.0
	TOTAL	52	100.0	100.0	

COUNT MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY 1.2 OCCURRENCES

```
   52  0  ******************************************
        I....+....I....+....I....+....I....+....I....+....I
        0         12         24         36         48         60
                  HISTOGRAM FREQUENCY
```

MEAN	.000	STD ERR	.000	MEDIAN	.000
MODE	.000	STD DEV	.000	VARIANCE	.000
RANGE	.000	MINIMUM	.000	MAXIMUM	.000
SUM	.000				

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES 52 MISSING CASES 0

OCC: OCCUPATION

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
EXECUTIVE	0	8	15.4	15.4	15.4
PROFESSIONAL	1	20	38.5	38.5	53.8
HOMEMAKER	2	9	17.3	17.3	71.2
SELF-EMPLOYED	3	2	3.8	3.8	75.0
TECHNICAL	4	2	3.8	3.8	78.8
SEMI-SKILLED	5	2	3.8	3.8	82.7
FARMER	6	1	1.9	1.9	84.6
SECRETARY	7	8	15.4	15.4	100.0
	TOTAL	52	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES
8	.00	**********
20	1.00	**********
9	2.00	**********
2	3.00	*****
2	4.00	*****
2	5.00	*****
1	6.00	***
8	7.00	**********

I.....I.....I.....I.....I.....I
0 4 8 12 16 20
HISTOGRAM FREQUENCY

MEAN	2.385	STD ERR	.330	MEDIAN	1.000
MODE	1.000	STD DEV	2.378	VARIANCE	5.653
KURTOSIS	-.258	S E KURT	.650	SKEWNESS	1.087
S E SKEW	.330	RANGE	7.000	MINIMUM	.000
MAXIMUM	7.000	SUM	124.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.000	66.67	2.000

VALID CASES 52 MISSING CASES 0

SPOCC: SPOUSES OCCUPATION

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
EXECUTIVE	0	6	11.5	11.5	11.5
PROFESSIONAL	1	12	23.1	23.1	34.6
HOMEMAKER	2	14	26.9	26.9	61.5
SELF-EMPLOYED	3	1	1.9	1.9	63.5
SEMI-SKILLED	5	1	1.9	1.9	65.4
FARMER	6	1	1.9	1.9	67.3
NO SPOUSE	8	3	5.8	5.8	73.1
UNKNOWN	9	14	26.9	26.9	100.0
	TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

```
   6   .00  ***************
  12  1.00  ******************************
  14  2.00  ***********************************
   1  3.00  ***
   0  4.00
   1  5.00  ***
   1  6.00  ***
   0  7.00
   3  8.00  ********
  14  9.00  ***********************************
          I.........I.........I.........I.........I
          0         4         8        12        16
                HISTOGRAM FREQUENCY
```

MEAN	3.923	STD ERR	.500	MEDIAN	2.000
MODE	2.000	STD DEV	3.607	VARIANCE	13.014
KURTOSIS	-1.539	S E KURT	.650	SKEWNESS	.557
S E SKEW	.330	RANGE	9.000	MINIMUM	.000
MAXIMUM	9.000	SUM	204.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.000	66.67	6.667

VALID CASES 52 MISSING CASES 0

INS: INSURANCE

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
BLUE CROSS BLUE SHIE	1	5	9.6	9.6	9.6
MEDICARE MEDICAID	2	1	1.9	1.9	11.5
OTHER PRIVATE	3	6	11.5	11.5	23.1
BCBS PLUS MEDI	5	18	34.6	34.6	57.7
BCBS PLUS MEDI PLUS	6	4	7.7	7.7	65.4
BCBS PLUS PRIV	7	12	23.1	23.1	88.5
MEDI PLUS PRIV	8	6	11.5	11.5	100.0
	TOTAL	52	100.0	100.0	

```
COUNT VALUE    ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

    5  1.00  ************
    1  2.00  ***
    6  3.00  ***************
    0  4.00
   18  5.00  *********************************************
    4  6.00  **********
   12  7.00  ******************************
    6  8.00  ***************
          I.........I.........I.........I.........I.........I
          0         4         8        12        16        20
                    HISTOGRAM FREQUENCY
```

MEAN	5.212	STD ERR	.286	MEDIAN	5.000
MODE	5.000	STD DEV	2.061	VARIANCE	4.248
KURTOSIS	-.362	S E KURT	.650	SKEWNESS	-.631
S E SKEW	.330	RANGE	7.000	MINIMUM	1.000
MAXIMUM	8.000	SUM	271.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	5.000	66.67	7.000

VALID CASES	52	MISSING CASES	0

DR: PHYSICIAN CODE

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
DR. A	23	1	1.9	1.9	1.9
DR. B	35	1	1.9	1.9	3.8
DR. C	43	15	28.8	28.8	32.7
DR. D	47	2	3.8	3.8	36.5
DR. E	49	16	30.8	30.8	67.3
DR. F	55	4	7.7	7.7	75.0
DR. G	62	5	9.6	9.6	84.6
DR. H	71	6	11.5	11.5	96.2
DR. I	79	1	1.9	1.9	98.1
DR. J	97	1	1.9	1.9	100.0
	TOTAL	52	100.0	100.0	

```
COUNT   MIDPOINT  ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

    0     20
    1     24  ***
    0     28
    0     32
    1     36  ***
    0     40
   15     44  ************************************
   18     48  *********************************************
    0     52
    4     56  **********
    0     60
    5     64  *************
    0     68
    6     72  ***************
    0     76
    1     80  ***
    0     84
    0     88
    0     92
    1     96  ***
    0    100
         I....+....I....+....I....+....I....+....I....+....I....+....I
         0         4         8        12        16        20
                   HISTOGRAM FREQUENCY
```

DR: PHYSICIAN CODE (Continued)

MEAN	52.173	STD ERR	1.736	MEDIAN	49.000
MODE	49.000	STD DEV	12.519	VARIANCE	156.734
KURTOSIS	2.451	S E KURT	.650	SKEWNESS	1.164
S E SKEW	.330	RANGE	74.000	MINIMUM	23.000
MAXIMUM	97.000	SUM	2713.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	45.667	66.67	51.000

VALID CASES	52	MISSING CASES	0

PRIHOS: PRIOR HOSPITALIZATIONS

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
0	41	78.8	78.8	78.8
1	9	17.3	17.3	96.2
2	1	1.9	1.9	98.1
5	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY 1 OCCURRENCE

```
 41   .00  ******************************************
  9  1.00  *********
  1  2.00  *
  0  3.00
  0  4.00
  1  5.00  *
          I.........I.........I.........I.........I.........I
          0         10        20        30        40        50
                    HISTOGRAM FREQUENCY
```

MEAN	.308	STD ERR	.112	MEDIAN	.000
MODE	.000	STD DEV	.805	VARIANCE	.649
KURTOSIS	22.793	S E KURT	.650	SKEWNESS	4.293
S E SKEW	.330	RANGE	5.000	MINIMUM	.000
MAXIMUM	5.000	SUM	16.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES 52 MISSING CASES 0

PRISUR: PRIOR SURGERIES

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
0	19	36.5	36.5	36.5
1	8	15.4	15.4	51.9
2	10	19.2	19.2	71.2
3	7	13.5	13.5	84.6
4	4	7.7	7.7	92.3
5	3	5.8	5.8	98.1
6	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

```
 19   .00  **************************************************
  8  1.00  ********************
 10  2.00  *************************
  7  3.00  ******************
  4  4.00  **********
  3  5.00  ********
  1  6.00  ***
       I.........I.........I.........I.........I.........I
       0         4         8        12        16        20
                 HISTOGRAM FREQUENCY
```

MEAN	1.654	STD ERR	.233	MEDIAN	1.000
MODE	.000	STD DEV	1.679	VARIANCE	2.819
KURTOSIS	-.352	S E KURT	.650	SKEWNESS	.756
S E SKEW	.330	RANGE	6.000	MINIMUM	.000
MAXIMUM	6.000	SUM	86.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	2.000

VALID CASES 52 MISSING CASES 0

ED: EDUCATION LEVEL

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
HIGH SCHOOL	0	30	57.7	57.7	57.7
COLLEGE	1	18	34.6	34.6	92.3
GRAD SCHOOL	2	4	7.7	7.7	100.0
	TOTAL	52	100.0	100.0	

```
COUNT VALUE    ONE SYMBOL EQUALS APPROXIMATELY .6 OCCURRENCES

   30   .00  **************************************************
   18  1.00  ******************************
    4  2.00  *******
           I.........I.........I.........I.........I.........I
           0         6        12        18        24        30
                 HISTOGRAM FREQUENCY
```

MEAN	.500	STD ERR	.089	MEDIAN	.000
MODE	.000	STD DEV	.642	VARIANCE	.412
KURTOSIS	-.160	S E KURT	.650	SKEWNESS	.926
S E SKEW	.330	RANGE	2.000	MINIMUM	.000
MAXIMUM	2.000	SUM	26.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	1.000

VALID CASES 52 MISSING CASES 0

DISCOD: DISCHARGE CODE

VALUE LABEL	VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
HOME WITH FAMILY	1	2	3.8	3.8	3.8
HOME WITH HEALTH AID	2	1	1.9	1.9	5.8
REHAB CENTER	3	2	3.8	3.8	9.6
HOME SELF CARE	4	47	90.4	90.4	100.0
	TOTAL	52	100.0	100.0	

```
COUNT VALUE  ONE SYMBOL EQUALS APPROXIMATELY 1 OCCURRENCE

    2  1.00  **
    1  2.00  *
    2  3.00  **
   47  4.00  ***********************************************

          I.........I.........I.........I.........I.........I
          0        10        20        30        40        50
                   HISTOGRAM FREQUENCY
```

MEAN	3.808	STD ERR	.091	MEDIAN	4.000
MODE	4.000	STD DEV	.658	VARIANCE	.433
KURTOSIS	12.809	S E KURT	.650	SKEWNESS	-3.644
S E SKEW	.330	RANGE	3.000	MINIMUM	1.000
MAXIMUM	4.000	SUM	198.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	4.000	66.67	4.000

VALID CASES	52	MISSING CASES	0

YRON: YEARS SINCE ONSET

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
1	2	3.8	3.8	3.8
1	2	3.8	3.8	7.7
1	4	7.7	7.7	15.4
2	3	5.8	5.8	21.2
2	5	9.6	9.6	30.8
3	5	9.6	9.6	40.4
4	1	1.9	1.9	42.3
4	1	1.9	1.9	44.2
5	3	5.8	5.8	50.0
6	2	3.8	3.8	53.8
7	1	1.9	1.9	55.8
7	3	5.8	5.8	61.5
8	1	1.9	1.9	63.5
9	1	1.9	1.9	65.4
10	6	11.5	11.5	76.9
11	1	1.9	1.9	78.8
12	2	3.8	3.8	82.7
13	2	3.8	3.8	86.5
14	2	3.8	3.8	90.4
15	2	3.8	3.8	94.2
18	1	1.9	1.9	96.2
27	1	1.9	1.9	98.1
30	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

YRON: YEARS SINCE ONSET (Continued)

COUNT	MIDPOINT	ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES
2	.0	*****
14	1.5	**********
6	3.0	**********
4	4.5	**********
3	6.0	********
4	7.5	**********
1	9.0	***
7	10.5	**********
2	12.0	*****
4	13.5	**********
2	15.0	*****
0	16.5	
1	18.0	***
0	19.5	
0	21.0	
0	22.5	
0	24.0	
0	25.5	
1	27.0	***
0	28.5	
1	30.0	***

I....+....I....+....I....+....I....+....I
0 4 8 12 16
HISTOGRAM FREQUENCY

MEAN	7.087	STD ERR	.892	MEDIAN	5.500
MODE	10.000	STD DEV	6.432	VARIANCE	41.367
KURTOSIS	3.057	S E KURT	.650	SKEWNESS	1.543
S E SKEW	.330	RANGE	29.500	MINIMUM	.500
MAXIMUM	30.000	SUM	368.500		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	3.000	66.67	10.000

VALID CASES	52	MISSING CASES	0

TOTDX: TOTAL # OF DIAGNOSES

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
1	4	7.7	7.7	7.7
2	13	25.0	25.0	32.7
3	13	25.0	25.0	57.7
4	7	13.5	13.5	71.2
5	10	19.2	19.2	90.4
6	3	5.8	5.8	96.2
7	1	1.9	1.9	98.1
9	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

```
 4    1.00  **********
13    2.00  **********************************
13    3.00  **********************************
 7    4.00  ******************
10    5.00  *************************
 3    6.00  ********
 1    7.00  ***
 0    8.00
 1    9.00  ***
           I.........I.........I.........I.........I.........I
           0         4         8        12        16        20
                     HISTOGRAM FREQUENCY
```

MEAN	3.481	STD ERR	.232	MEDIAN	3.000
MODE	2.000	STD DEV	1.674	VARIANCE	2.804
KURTOSIS	.942	S E KURT	.650	SKEWNESS	.830
S E SKEW	.330	RANGE	8.000	MINIMUM	1.000
MAXIMUM	9.000	SUM	181.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	2.667	66.67	4.000

VALID CASES 52 MISSING CASES 0

TOTCOMP: TOTAL # OF COMPLICATIONS

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
0	1	1.9	1.9	1.9
1	34	65.4	65.4	67.3
2	9	17.3	17.3	84.6
3	4	7.7	7.7	92.3
4	2	3.8	3.8	96.2
6	1	1.9	1.9	98.1
10	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .8 OCCURRENCES
1	.00	*
34	1.00	**
9	2.00	************
4	3.00	*****
2	4.00	***
0	5.00	
1	6.00	*
0	7.00	
0	8.00	
0	9.00	
1	10.00	*

I.....I.....I.....I.....I.....I
0 8 16 24 32 40
HISTOGRAM FREQUENCY

MEAN	1.692	STD ERR	.217	MEDIAN	1.000
MODE	1.000	STD DEV	1.566	VARIANCE	2.452
KURTOSIS	15.856	S E KURT	.650	SKEWNESS	3.563
S E SKEW	.330	RANGE	10.000	MINIMUM	.000
MAXIMUM	10.000	SUM	88.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.000	66.67	1.333

VALID CASES	52	MISSING CASES	0

LOSPO: LENGTH OF STAY POST-OPERATIVE

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
6	1	1.9	1.9	1.9
7	3	5.8	5.8	7.7
8	4	7.7	7.7	15.4
9	7	13.5	13.5	28.8
10	16	30.8	30.8	59.6
11	7	13.5	13.5	73.1
12	4	7.7	7.7	80.8
13	3	5.8	5.8	86.5
14	2	3.8	3.8	90.4
16	1	1.9	1.9	92.3
17	1	1.9	1.9	94.2
18	1	1.9	1.9	96.2
20	1	1.9	1.9	98.1
36	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT	MIDPOINT	ONE SYMBOL EQUALS APPROXIMATELY .5 OCCURRENCES
1	6.0	**
7	7.5	**********
7	9.0	**********
23	10.5	**********
4	12.0	********
5	13.5	**********
0	15.0	
2	16.5	****
1	18.0	**
1	19.5	**
0	21.0	
0	22.5	
0	24.0	
0	25.5	
0	27.0	
0	28.5	
0	30.0	
0	31.5	
0	33.0	
0	34.5	
1	36.0	**

I....+....I....+....I....+....I....+....I....+....I....+....I
0 5 10 15 20 25
HISTOGRAM FREQUENCY

LOSPO: LENGTH OF STAY POST-OPERATIVE (Continued)

MEAN	11.173	STD ERR	.615	MEDIAN	10.000
MODE	10.000	STD DEV	4.431	VARIANCE	19.636
KURTOSIS	19.253	S E KURT	.650	SKEWNESS	3.774
S E SKEW	.330	RANGE	30.000	MINIMUM	6.000
MAXIMUM	36.000	SUM	581.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	10.000	66.67	11.000

VALID CASES	52	MISSING CASES	0

OOB8M: OUT OF BED 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.50	1	1.9	1.9	1.9
1.00	1	1.9	1.9	3.8
1.13	1	1.9	1.9	5.8
1.25	1	1.9	1.9	7.7
1.38	3	5.8	5.8	13.5
1.50	1	1.9	1.9	15.4
1.63	5	9.6	9.6	25.0
1.75	1	1.9	1.9	26.9
1.88	5	9.6	9.6	36.5
2.00	3	5.8	5.8	42.3
2.13	8	15.4	15.4	57.7
2.25	3	5.8	5.8	63.5
2.38	7	13.5	13.5	76.9
2.50	5	9.6	9.6	86.5
2.63	3	5.8	5.8	92.3
2.75	2	3.8	3.8	96.2
3.13	2	3.8	3.8	100.0
TOTAL	52	100.0	100.0	

COUNT MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES

```
 0     .30
 1     .45  *****
 0     .60
 0     .75
 0     .90
 1    1.05  *****
 2    1.20  **********
 3    1.35  ***************
 1    1.50  *****
 5    1.65  *************************
 6    1.80  ******************************
 3    1.95  ***************
 8    2.10  ****************************************
 3    2.25  ***************
 7    2.40  ***********************************
 5    2.55  *************************
 5    2.70  *************************
 0    2.85
 0    3.00
 2    3.15  **********
 0    3.30
      I....+....I....+....I....+....I....+....I....+....I....+....I
      0         2         4         6         8        10
                HISTOGRAM FREQUENCY
```

OOB8M: OUT OF BED 8 DAY MEAN (Continued)

MEAN	2.063	STD ERR	.073	MEDIAN	2.125
MODE	2.125	STD DEV	.524	VARIANCE	.275
KURTOSIS	.601	S E KURT	.650	SKEWNESS	-.534
S E SKEW	.330	RANGE	2.625	MINIMUM	.500
MAXIMUM	3.125	SUM	107.250		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.875	66.67	2.375

VALID CASES	52	MISSING CASES	0

PWBF8M: WALKER FUNCTION 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.25	2	3.8	3.8	3.8
.38	1	1.9	1.9	5.8
.50	1	1.9	1.9	7.7
.63	2	3.8	3.8	11.5
.75	2	3.8	3.8	15.4
.88	2	3.8	3.8	19.2
1.00	1	1.9	1.9	21.2
1.13	4	7.7	7.7	28.8
1.25	5	9.6	9.6	38.5
1.38	2	3.8	3.8	42.3
1.50	6	11.5	11.5	53.8
1.63	3	5.8	5.8	59.6
1.75	6	11.5	11.5	71.2
1.88	2	3.8	3.8	75.0
2.00	2	3.8	3.8	78.8
2.13	3	5.8	5.8	84.6
2.25	1	1.9	1.9	86.5
2.38	1	1.9	1.9	88.5
2.50	1	1.9	1.9	90.4
2.63	1	1.9	1.9	92.3
2.75	3	5.8	5.8	98.1
2.88	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

PWBF8M: WALKER FUNCTION 8 DAY MEAN

```
COUNT   MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES

     0     .05
     2     .20  **********
     1     .35  *****
     1     .50  *****
     2     .65  **********
     4     .80  ********************
     1     .95  *****
     4    1.10  ********************
     5    1.25  *************************
     2    1.40  **********
     9    1.55  *********************************************
     6    1.70  ******************************
     2    1.85  **********
     2    2.00  **********
     3    2.15  ***************
     1    2.30  *****
     2    2.45  **********
     1    2.60  *****
     3    2.75  ***************
     1    2.90  *****
     0    3.05
          I....+....I....+....I....+....I....+....I....+....I....+....I
          0         2         4         6         8        10
                    HISTOGRAM FREQUENCY
```

MEAN	1.534	STD ERR	.092	MEDIAN	1.500
MODE	1.500	STD DEV	.664	VARIANCE	.441
KURTOSIS	-.407	S E KURT	.650	SKEWNESS	.103
S E SKEW	.330	RANGE	2.625	MINIMUM	.250
MAXIMUM	2.875	SUM	79.750		

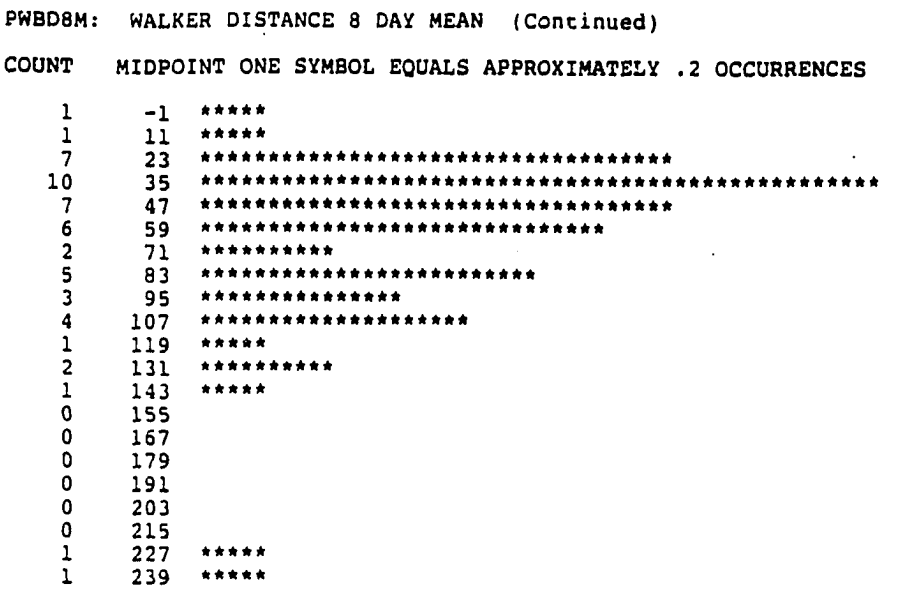
PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.250	66.67	1.750

VALID CASES	52	MISSING CASES	0

PWBD8M: WALKER DISTANCE 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
2.50	1	1.9	1.9	1.9
15.50	1	1.9	1.9	3.8
17.13	1	1.9	1.9	5.8
18.75	1	1.9	1.9	7.7
21.25	1	1.9	1.9	9.6
25.00	2	3.8	3.8	13.5
25.63	1	1.9	1.9	15.4
26.25	1	1.9	1.9	17.3
31.25	1	1.9	1.9	19.2
33.13	1	1.9	1.9	21.2
34.38	1	1.9	1.9	23.1
36.25	3	5.8	5.8	28.8
36.88	1	1.9	1.9	30.8
37.50	2	3.8	3.8	34.6
38.13	1	1.9	1.9	36.5
41.25	1	1.9	1.9	38.5
45.00	1	1.9	1.9	40.4
45.63	1	1.9	1.9	42.3
46.25	1	1.9	1.9	44.2
47.50	1	1.9	1.9	46.2
48.75	1	1.9	1.9	48.1
50.00	1	1.9	1.9	50.0
57.50	3	5.8	5.8	55.8
60.00	1	1.9	1.9	57.7
61.25	1	1.9	1.9	59.6
64.38	1	1.9	1.9	61.5
72.50	1	1.9	1.9	63.5
76.25	1	1.9	1.9	65.4
81.25	1	1.9	1.9	67.3
84.38	1	1.9	1.9	69.2
85.00	2	3.8	3.8	73.1
86.25	1	1.9	1.9	75.0
90.00	1	1.9	1.9	76.9
90.63	1	1.9	1.9	78.8
96.25	1	1.9	1.9	80.8
101.25	2	3.8	3.8	84.6
106.25	1	1.9	1.9	86.5
109.38	1	1.9	1.9	88.5
121.88	1	1.9	1.9	90.4
125.00	1	1.9	1.9	92.3
128.13	1	1.9	1.9	94.2
145.63	1	1.9	1.9	96.2
227.50	1	1.9	1.9	98.1
236.25	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

PWBD8M: WALKER DISTANCE 8 DAY MEAN (Continued)



MEAN	66.673	STD ERR	6.550	MEDIAN	53.750
MODE	36.250	STD DEV	47.234	VARIANCE	2231.071
KURTOSIS	4.092	S E KURT	.650	SKEWNESS	1.754
S E SKEW	.330	RANGE	233.750	MINIMUM	2.500
MAXIMUM	236.250	SUM	3467.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	37.500	66.67	82.292

VALID CASES	52	MISSING CASES	0

LOFF8M: CRUTCH FUNCTION 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	9	17.3	17.3	17.3
.13	5	9.6	9.6	26.9
.25	6	11.5	11.5	38.5
.38	3	5.8	5.8	44.2
.50	3	5.8	5.8	50.0
.63	6	11.5	11.5	61.5
.75	6	11.5	11.5	73.1
.88	3	5.8	5.8	78.8
1.00	3	5.8	5.8	84.6
1.13	1	1.9	1.9	86.5
1.25	1	1.9	1.9	88.5
1.50	2	3.8	3.8	92.3
1.88	2	3.8	3.8	96.2
2.38	1	1.9	1.9	98.1
2.75	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES

```
 0   -.15
 9    .00  *********************************************
 5    .15  *************************
 9    .30  *********************************************
 3    .45  ***************
 6    .60  ********************************
 6    .75  ********************************
 3    .90  ***************
 3   1.05  ***************
 2   1.20  **********
 0   1.35
 2   1.50  **********
 0   1.65
 2   1.80  **********
 0   1.95
 0   2.10
 0   2.25
 1   2.40  *****
 0   2.55
 1   2.70  *****
 0   2.85
          I....+....I....+....I....+....I....+....I....+....I....+....I
          0         2         4         6         8        10
                   HISTOGRAM FREQUENCY
```

LOFF8M: CRUTCH FUNCTION 8 DAY MEAN (Continued)

MEAN	.632	STD ERR	.086	MEDIAN	.563
MODE	.000	STD DEV	.617	VARIANCE	.381
KURTOSIS	2.509	S E KURT	.650	SKEWNESS	1.491
S E SKEW	.330	RANGE	2.750	MINIMUM	.000
MAXIMUM	2.750	SUM	32.875		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.250	66.67	.750

VALID CASES	52	MISSING CASES	0

LOFD8M: CRUTCH DISTANCE 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	10	19.2	19.2	19.2
1.88	1	1.9	1.9	21.2
4.38	1	1.9	1.9	23.1
5.00	1	1.9	1.9	25.0
6.25	2	3.8	3.8	28.8
15.00	1	1.9	1.9	30.8
15.63	1	1.9	1.9	32.7
18.75	2	3.8	3.8	36.5
25.00	4	7.7	7.7	44.2
27.50	1	1.9	1.9	46.2
31.25	2	3.8	3.8	50.0
33.13	1	1.9	1.9	51.9
33.75	1	1.9	1.9	53.8
34.38	1	1.9	1.9	55.8
35.63	1	1.9	1.9	57.7
37.50	4	7.7	7.7	65.4
43.75	3	5.8	5.8	71.2
50.00	1	1.9	1.9	73.1
57.50	1	1.9	1.9	75.0
62.50	1	1.9	1.9	76.9
65.63	2	3.8	3.8	80.8
68.75	1	1.9	1.9	82.7
75.00	4	7.7	7.7	90.4
93.75	1	1.9	1.9	92.3
100.00	2	3.8	3.8	96.2
105.00	1	1.9	1.9	98.1
156.25	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

LOFD8M: CRUTCH DISTANCE 8 DAY MEAN (Continued)

COUNT	MIDPOINT	ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES
11	-2	**********
4	6	**********
2	14	*****
6	22	**********
5	30	**********
6	38	**********
3	46	********
2	54	*****
3	62	********
1	70	***
4	78	**********
0	86	
1	94	***
3	102	********
0	110	
0	118	
0	126	
0	134	
0	142	
0	150	
1	158	***

```
I....+....I....+....I....+....I....+....I
0         4         8        12        16
```

HISTOGRAM FREQUENCY

MEAN	37.019	STD ERR	4.799	MEDIAN	32.188
MODE	.000	STD DEV	34.607	VARIANCE	1197.650
KURTOSIS	1.453	S E KURT	.650	SKEWNESS	1.132
S E SKEW	.330	RANGE	156.250	MINIMUM	.000
MAXIMUM	156.250	SUM	1925.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	17.708	66.67	43.750

VALID CASES	52	MISSING CASES	0

HCHAIR8M: HI-CHAIR 8 DAY MEAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	3	5.8	5.8	5.8
.13	1	1.9	1.9	7.7
.25	3	5.8	5.8	13.5
.38	5	9.6	9.6	23.1
.50	10	19.2	19.2	42.3
.63	1	1.9	1.9	44.2
.75	4	7.7	7.7	51.9
.88	2	3.8	3.8	55.8
1.00	5	9.6	9.6	65.4
1.13	2	3.8	3.8	69.2
1.25	4	7.7	7.7	76.9
1.38	2	3.8	3.8	80.8
1.50	2	3.8	3.8	84.6
1.63	1	1.9	1.9	86.5
1.75	2	3.8	3.8	90.4
2.00	1	1.9	1.9	92.3
2.25	1	1.9	1.9	94.2
2.38	1	1.9	1.9	96.2
2.50	1	1.9	1.9	98.1
2.63	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

HCHAIR8M: HI-CHAIR 8 DAY MEAN

```
COUNT   MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

    0    -.20
    3    -.05  ********
    1     .10  ***
    3     .25  ********
    5     .40  *************
   11     .55  ******************************
    4     .70  **********
    2     .85  *****
    5    1.00  *************
    2    1.15  *****
    6    1.30  ***************
    2    1.45  *****
    1    1.60  ***
    2    1.75  *****
    0    1.90
    1    2.05  ***
    1    2.20  ***
    1    2.35  ***
    1    2.50  ***
    1    2.65  ***
    0    2.80
         I....+....I....+....I....+....I....+....I....+....I
         0         4         8        12        16        20
                   HISTOGRAM FREQUENCY
```

MEAN	.923	STD ERR	.091	MEDIAN	.750
MODE	.500	STD DEV	.656	VARIANCE	.430
KURTOSIS	.268	S E KURT	.650	SKEWNESS	.898
S E SKEW	.330	RANGE	2.625	MINIMUM	.000
MAXIMUM	2.625	SUM	48.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.500	66.67	1.125

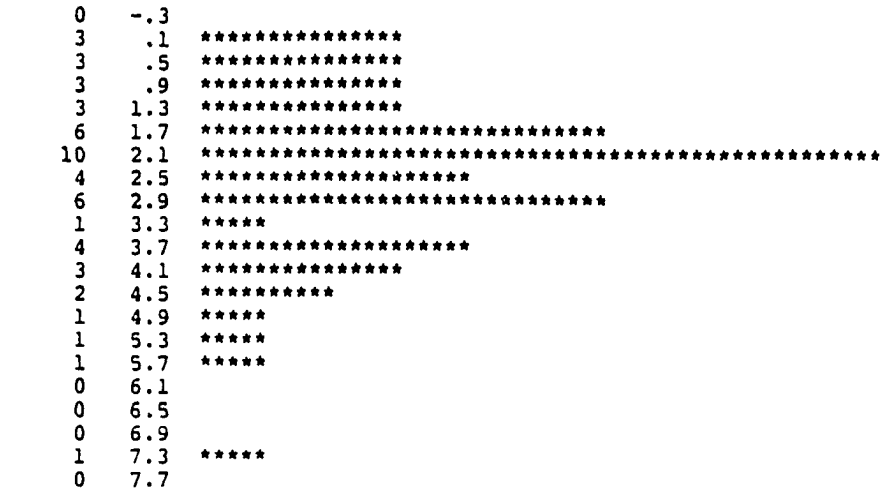
VALID CASES	52	MISSING CASES	0

TOTCOM8M: DAY 8 MEAN # OF ALL COMPLAINTS

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.13	1	1.9	1.9	1.9
.25	2	3.8	3.8	5.8
.50	1	1.9	1.9	7.7
.63	2	3.8	3.8	11.5
.75	2	3.8	3.8	15.4
.88	1	1.9	1.9	17.3
1.13	2	3.8	3.8	21.2
1.38	1	1.9	1.9	23.1
1.50	3	5.8	5.8	28.8
1.75	2	3.8	3.8	32.7
1.88	1	1.9	1.9	34.6
2.00	3	5.8	5.8	40.4
2.13	5	9.6	9.6	50.0
2.25	2	3.8	3.8	53.8
2.50	2	3.8	3.8	57.7
2.63	2	3.8	3.8	61.5
2.75	3	5.8	5.8	67.3
2.88	1	1.9	1.9	69.2
3.00	2	3.8	3.8	73.1
3.25	1	1.9	1.9	75.0
3.50	1	1.9	1.9	76.9
3.63	1	1.9	1.9	78.8
3.88	2	3.8	3.8	82.7
4.00	1	1.9	1.9	84.6
4.13	2	3.8	3.8	88.5
4.38	1	1.9	1.9	90.4
4.63	1	1.9	1.9	92.3
4.88	1	1.9	1.9	94.2
5.25	1	1.9	1.9	96.2
5.75	1	1.9	1.9	98.1
7.25	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

TOTCOM8M: DAY 8 MEAN # OF ALL COMPLAINTS (Continued)

COUNT MIDPOINT ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES



MEAN	2.486	STD ERR	.209	MEDIAN	2.188
MODE	2.125	STD DEV	1.508	VARIANCE	2.276
KURTOSIS	.826	S E KURT	.650	SKEWNESS	.793
S E SKEW	.330	RANGE	7.125	MINIMUM	.125
MAXIMUM	7.250	SUM	129.250		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.833	66.67	2.792

VALID CASES	52	MISSING CASES	0

NONDRS8M: 8 DAY MEAN # OF COMPLAINTS TO NON-DRS.

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	1	1.9	1.9	1.9
.13	1	1.9	1.9	3.8
.25	1	1.9	1.9	5.8
.38	2	3.8	3.8	9.6
.63	2	3.8	3.8	13.5
.75	1	1.9	1.9	15.4
.88	1	1.9	1.9	17.3
1.13	3	5.8	5.8	23.1
1.25	1	1.9	1.9	25.0
1.38	2	3.8	3.8	28.8
1.63	3	5.8	5.8	34.6
1.75	2	3.8	3.8	38.5
1.88	5	9.6	9.6	48.1
2.00	2	3.8	3.8	51.9
2.13	2	3.8	3.8	55.8
2.38	3	5.8	5.8	61.5
2.63	2	3.8	3.8	65.4
2.75	3	5.8	5.8	71.2
2.88	3	5.8	5.8	76.9
3.25	2	3.8	3.8	80.8
3.50	2	3.8	3.8	84.6
3.75	1	1.9	1.9	86.5
3.88	1	1.9	1.9	88.5
4.00	2	3.8	3.8	92.3
4.38	1	1.9	1.9	94.2
4.88	1	1.9	1.9	96.2
5.50	1	1.9	1.9	98.1
6.25	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

NONDRS8M: 8 DAY MEAN # OF COMPLAINTS TO NON-DRS. (Continued)

```
COUNT   MIDPOINT  ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES

    2     .1   **********
    3     .4   ***************
    3     .7   ***************
    4    1.0   ********************
    3    1.3   ***************
    5    1.6   *************************
    7    1.9   ************************************
    2    2.2   **********
    5    2.5   *************************
    6    2.8   ******************************
    2    3.1   **********
    2    3.4   **********
    1    3.7   *****
    3    4.0   ***************
    1    4.3   *****
    0    4.6
    1    4.9   *****
    0    5.2
    1    5.5   *****
    0    5.8
    1    6.1   *****
          I....+....I....+....I....+....I....+....I
          0         2         4         6         8
                   HISTOGRAM FREQUENCY
```

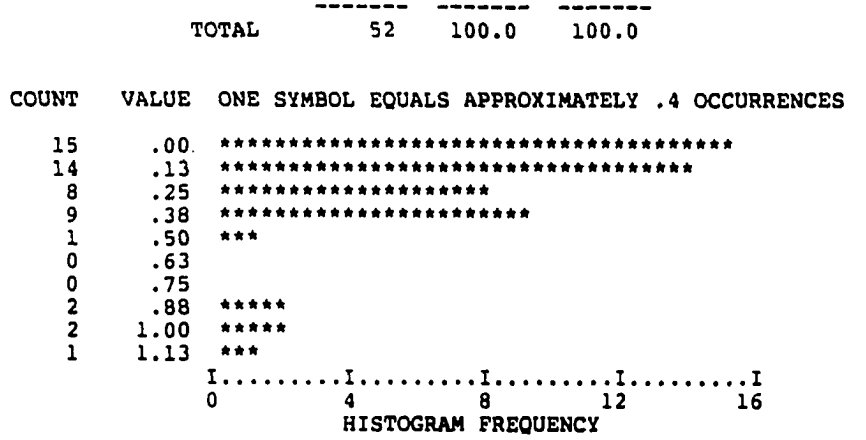
MEAN	2.245	STD ERR	.190	MEDIAN	2.000
MODE	1.875	STD DEV	1.367	VARIANCE	1.868
KURTOSIS	.562	S E KURT	.650	SKEWNESS	.705
S E SKEW	.330	RANGE	6.250	MINIMUM	.000
MAXIMUM	6.250	SUM	116.750		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	1.625	66.67	2.750

VALID CASES	52	MISSING CASES	0

DRS8M: 8 DAY MEAN # OF COMPLAINTS TO PHYSICIANS

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	15	28.8	28.8	28.8
.13	14	26.9	26.9	55.8
.25	8	15.4	15.4	71.2
.38	9	17.3	17.3	88.5
.50	1	1.9	1.9	90.4
.88	2	3.8	3.8	94.2
1.00	2	3.8	3.8	98.1
1.13	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	



MEAN	.240	STD ERR	.039	MEDIAN	.125
MODE	.000	STD DEV	.281	VARIANCE	.079
KURTOSIS	2.699	S E KURT	.650	SKEWNESS	1.737
S E SKEW	.330	RANGE	1.125	MINIMUM	.000
MAXIMUM	1.125	SUM	12.500		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.125	66.67	.250

VALID CASES	52	MISSING CASES	0

OPPA8M: OPERATIVE PAIN 8 DAY MEAN NON-PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	3	5.8	5.8	5.8
.13	1	1.9	1.9	7.7
.25	3	5.8	5.8	13.5
.38	3	5.8	5.8	19.2
.50	2	3.8	3.8	23.1
.63	6	11.5	11.5	34.6
.75	5	9.6	9.6	44.2
.88	2	3.8	3.8	48.1
1.00	1	1.9	1.9	50.0
1.13	8	15.4	15.4	65.4
1.25	1	1.9	1.9	67.3
1.38	1	1.9	1.9	69.2
1.50	3	5.8	5.8	75.0
1.63	3	5.8	5.8	80.8
1.75	3	5.8	5.8	86.5
1.88	1	1.9	1.9	88.5
2.13	3	5.8	5.8	94.2
2.25	1	1.9	1.9	96.2
2.50	1	1.9	1.9	98.1
2.88	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

OPPA8M: OPERATIVE PAIN 8 DAY MEAN NON-PHYSICIAN (Continued)

COUNT	MIDPOINT	ONE SYMBOL EQUALS APPROXIMATELY .2 OCCURRENCES
3	-.05	**********
1	.10	*****
3	.25	**********
3	.40	**********
8	.55	**********
5	.70	**********
2	.85	**********
1	1.00	*****
8	1.15	**********
2	1.30	**********
3	1.45	**********
3	1.60	**********
3	1.75	**********
1	1.90	*****
0	2.05	
4	2.20	**********
0	2.35	
1	2.50	*****
0	2.65	
1	2.80	*****
0	2.95	

I....+....I....+....I....+....I....+....I
0 2 4 6 8
HISTOGRAM FREQUENCY

MEAN	1.065	STD ERR	.095	MEDIAN	1.063
MODE	1.125	STD DEV	.685	VARIANCE	.469
KURTOSIS	-.241	S E KURT	.650	SKEWNESS	.529
S E SKEW	.330	RANGE	2.875	MINIMUM	.000
MAXIMUM	2.875	SUM	55.375		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.625	66.67	1.292

VALID CASES	52	MISSING CASES	0

OPPADR8M = OPERATIVE PAIN 8 DAY MEAN PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	40	76.9	76.9	76.9
.13	7	13.5	13.5	90.4
.25	4	7.7	7.7	98.1
.38	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

```
COUNT   VALUE   ONE SYMBOL EQUALS APPROXIMATELY .8 OCCURRENCES

   40     .00  **************************************************
    7     .13  *********
    4     .25  *****
    1     .38  *
              I.........I.........I.........I.........I.........I
              0         8        16        24        32        40
                        HISTOGRAM FREQUENCY
```

MEAN	.043	STD ERR	.012	MEDIAN	.000
MODE	.000	STD DEV	.089	VARIANCE	.008
KURTOSIS	3.846	S E KURT	.650	SKEWNESS	2.105
S E SKEW	.330	RANGE	.375	MINIMUM	.000
MAXIMUM	.375	SUM	2.250		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES	52	MISSING CASES	0

DZ8M: DIZZINESS 8 DAY MEAN NON-PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	32	61.5	61.5	61.5
.13	8	15.4	15.4	76.9
.25	7	13.5	13.5	90.4
.38	1	1.9	1.9	92.3
.50	1	1.9	1.9	94.2
.63	2	3.8	3.8	98.1
.75	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

```
COUNT   VALUE   ONE SYMBOL EQUALS APPROXIMATELY .8 OCCURRENCES

   32     .00  ****************************************
    8     .13  **********
    7     .25  *********
    1     .38  *
    1     .50  *
    2     .63  ***
    1     .75  *
              I.........I.........I.........I.........I.........I
              0         8        16        24        32        40
                      HISTOGRAM FREQUENCY
```

MEAN	.108	STD ERR	.025	MEDIAN	.000
MODE	.000	STD DEV	.182	VARIANCE	.033
KURTOSIS	3.823	S E KURT	.650	SKEWNESS	2.028
S E SKEW	.330	RANGE	.750	MINIMUM	.000
MAXIMUM	.750	SUM	5.625		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.125

VALID CASES 52 MISSING CASES 0

DZDR8M: DIZZINESS 8 DAY MEAN PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	46	88.5	88.5	88.5
.13	3	5.8	5.8	94.2
.25	1	1.9	1.9	96.2
.38	1	1.9	1.9	98.1
.50	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY 1 OCCURRENCE

```
 46   .00  **********************************************
  3   .13  ***
  1   .25  *
  1   .38  *
  1   .50  *
           I.........I.........I.........I.........I.........I
           0        10        20        30        40        50
                    HISTOGRAM FREQUENCY
```

MEAN	.029	STD ERR	.013	MEDIAN	.000
MODE	.000	STD DEV	.095	VARIANCE	.009
KURTOSIS	15.053	S E KURT	.650	SKEWNESS	3.812
S E SKEW	.330	RANGE	.500	MINIMUM	.000
MAXIMUM	.500	SUM	1.500		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES	52	MISSING CASES	0

TI8M: FATIGUE 8 DAY MEAN NON-PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	20	38.5	38.5	38.5
.13	10	19.2	19.2	57.7
.25	8	15.4	15.4	73.1
.38	6	11.5	11.5	84.6
.50	3	5.8	5.8	90.4
.63	1	1.9	1.9	92.3
.75	2	3.8	3.8	96.2
1.00	2	3.8	3.8	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES

```
 20   .00  **************************************************
 10   .13  *************************
  8   .25  ********************
  6   .38  ***************
  3   .50  ********
  1   .63  ***
  2   .75  *****
  0   .88
  2  1.00  *****
          I.........I.........I.........I.........I.........I
          0         4         8        12        16        20
                    HISTOGRAM FREQUENCY
```

MEAN	.214	STD ERR	.036	MEDIAN	.125
MODE	.000	STD DEV	.258	VARIANCE	.066
KURTOSIS	1.940	S E KURT	.650	SKEWNESS	1.480
S E SKEW	.330	RANGE	1.000	MINIMUM	.000
MAXIMUM	1.000	SUM	11.125		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.250

VALID CASES 52 MISSING CASES 0

TIDR8M: FATIGUE 8 DAY MEAN PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	50	96.2	96.2	96.2
.13	1	1.9	1.9	98.1
.25	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

```
COUNT  VALUE  ONE SYMBOL EQUALS APPROXIMATELY 1 OCCURRENCE

   50    .00  **************************************************
    1    .13  *
    1    .25  *
             I.........I.........I.........I.........I.........I
             0        10        20        30        40        50
                      HISTOGRAM FREQUENCY
```

MEAN	.007	STD ERR	.005	MEDIAN	.000
MODE	.000	STD DEV	.038	VARIANCE	.001
KURTOSIS	33.802	S E KURT	.650	SKEWNESS	5.711
S E SKEW	.330	RANGE	.250	MINIMUM	.000
MAXIMUM	.250	SUM	.375		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES 52 MISSING CASES 0

OC8M: EMOTIONAL COMPLAINTS 8 DAY MEAN NON-PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	19	36.5	36.5	36.5
.13	11	21.2	21.2	57.7
.25	11	21.2	21.2	78.8
.38	4	7.7	7.7	86.5
.50	2	3.8	3.8	90.4
.63	2	3.8	3.8	94.2
1.00	2	3.8	3.8	98.1
1.13	1	1.9	1.9	100.0
TOTAL	52	100.0	100.0	

COUNT	VALUE	ONE SYMBOL EQUALS APPROXIMATELY .4 OCCURRENCES
19	.00	**********
11	.13	******
11	.25	******
4	.38	**
2	.50	*
2	.63	*
0	.75	
0	.88	
2	1.00	*
1	1.13	*

I.....I.....I.....I.....I.....I
0 4 8 12 16 20
HISTOGRAM FREQUENCY

MEAN	.212	STD ERR	.037	MEDIAN	.125
MODE	.000	STD DEV	.267	VARIANCE	.071
KURTOSIS	3.663	S E KURT	.650	SKEWNESS	1.884
S E SKEW	.330	RANGE	1.125	MINIMUM	.000
MAXIMUM	1.125	SUM	11.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.250

VALID CASES	52	MISSING CASES	0

OCDR8M: EMOTIONAL COMPLAINTS 8 DAY MEAN PHYSICIAN

VALUE	FREQUENCY	PERCENT	VALID PERCENT	CUM PERCENT
.00	43	82.7	82.7	82.7
.13	4	7.7	7.7	90.4
.25	3	5.8	5.8	96.2
.38	2	3.8	3.8	100.0
TOTAL	52	100.0	100.0	

COUNT VALUE ONE SYMBOL EQUALS APPROXIMATELY 1 OCCURRENCE

```
 43   .00  ******************************************
  4   .13  ****
  3   .25  ***
  2   .38  **
          I.........I.........I.........I.........I.........I
          0        10        20        30        40        50
                   HISTOGRAM FREQUENCY
```

MEAN	.038	STD ERR	.013	MEDIAN	.000
MODE	.000	STD DEV	.094	VARIANCE	.009
KURTOSIS	5.704	S E KURT	.650	SKEWNESS	2.541
S E SKEW	.330	RANGE	.375	MINIMUM	.000
MAXIMUM	.375	SUM	2.000		

PERCENTILE	VALUE	PERCENTILE	VALUE
33.33	.000	66.67	.000

VALID CASES 52 MISSING CASES 0

APPENDIX G

PEARSON CORRELATION MATRICES

SELECTED INDEPENDENT VARIABLES, DEPENDENT VARIABLES, AND INDICATOR VARIABLES

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness & Demographics

	HARDINES	AGE	SEX	YRON	OCC
HARDINES	1.0000	-.1798	-.0307	.1052	-.19142
	(0)	(52)	(52)	(52)	(52))
	P= .	P= .101	P= .414	P= .229	P= .0879
AGE	-.1798	1.0000	.1297	-.0929	-.14199
	(52)	(0)	(52)	(52)	(52))
	P= .101	P= .	P= .180	P= .256	P= .1586
SEX	-.0307	.1297	1.0000	-.1479	.24959
	(52)	(52)	(0)	(52)	(52))
	P= .414	P= .180	P= .	P= .148	P= .0378
YRON	.1052	-.0929	-.1479	1.0000	-.05250
	(52)	(52)	(52)	(0)	(52))
	P= .229	P= .256	P= .148	P= .	P= .3560
OCC	-.1914	-.1419	.2495	-.0525	1.00005
	(52)	(52)	(52)	(52)	(0))
	P= .087	P= .158	P= .037	P= .356	P= . 6
SPOCC	-.1922	.0925	-.1711	-.0846	.06306
	(52)	(52)	(52)	(52)	(52))
	P= .086	P= .257	P= .113	P= .275	P= .3295
ED	.2091	-.3028	-.3035	.2090	-.43700
	(52)	(52)	(52)	(52)	(52))
	P= .068	P= .015	P= .014	P= .068	P= .0018
YRON	.1052	-.0929	-.1479	1.0000	-.05250
	(52)	(52)	(52)	(52)	(52))
	P= .229	P= .256	P= .148	P= .000	P= .356

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness & Demographics
(Continued)

HARDINES	SPOCC	ED	YRON
	-.1922	.2091	.105
	(52)	(52)	(52
AGE	P= .086	P= .068	P= .22
	.0925	-.3028	-.092
	(52)	(52)	(52
SEX	P= .257	P= .015	P= .25
	-.1711	-.3035	-.147
	(52)	(52)	(52
YRON	P= .113	P= .014	P= .14
	-.0846	.2090	1.000
	(52)	(52)	(52
OCC	P= .275	P= .068	P= .00
	.0630	-.4370	-.052
	(52)	(52)	(52
SPOCC	P= .329	P= .001	P= .35
	1.0000	.1271	-.084
	(0)	(52)	(52
ED	P= .	P= .185	P= .27
	.1271	1.0000	.209
	(52)	(0)	(52
YRON	P= .185	P= .	P= .06
	-.0846	.2090	1.000
	(52)	(52)	(0
	P= .275	P= .068	P= .

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Demographics, Number of Diagnoses, Number of Complications & Length of Stay

	HARDINES	AGE	SEX	TOTDX	YRON
HARDINES	1.0000	-.1798	-.0307	-.3298	.1052
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .101	P= .414	P= .008	P= .229
AGE	-.1798	1.0000	.1297	.2445	-.0929
	(52)	(0)	(52)	(52)	(52)
	P= .101	P= .	P= .180	P= .040	P= .256
SEX	-.0307	.1297	1.0000	.0125	-.1479
	(52)	(52)	(0)	(52)	(52)
	P= .414	P= .180	P= .	P= .465	P= .148
TOTDX	-.3298	.2445	.0125	1.0000	-.1947
	(52)	(52)	(52)	(0)	(52)
	P= .008	P= .040	P= .465	P= .	P= .083
YRON	.1052	-.0929	-.1479	-.1947	1.0000
	(52)	(52)	(52)	(52)	(0)
	P= .229	P= .256	P= .148	P= .083	P= .
TOTCOMP	.0337	-.0626	.2889	.1846	-.2319
	(52)	(52)	(52)	(52)	(52)
	P= .406	P= .330	P= .019	P= .095	P= .049
LOSPO	-.3021	.1679	.2123	.4907	-.1288
	(52)	(52)	(52)	(52)	(52)
	P= .015	P= .117	P= .065	P= .000	P= .181

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Demographics, Number of Diagnoses, Number of Complications & Length of Stay
(Continued)

	TOTCOMP	LOSPO
HARDINES	.0337	-.3021
	(52)	(52)
	P= .406	P= .015
AGE	-.0626	.1679
	(52)	(52)
	P= .330	P= .117
SEX	.2889	.2123
	(52)	(52)
	P= .019	P= .065
TOTDX	.1846	.4907
	(52)	(52)
	P= .095	P= .000
YRON	-.2319	-.1288
	(52)	(52)
	P= .049	P= .181
TOTCOMP	1.0000	.3497
	(0)	(52)
	P= .	P= .006
LOSPO	.3497	1.0000
	(52)	(0)
	P= .006	P= .

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Demographics, & Level Of Activity Variables

	HARDINES	AGE	SEX	TOTDX	PWBD8M	LOFD8M
HARDINES	1.0000	-.1798	-.0307	-.3298	.0755	.2132
	(0)	(52)	(52)	(52)	(52)	(52)
	P= .	P= .101	P= .414	P= .008	P= .297	P= .065
AGE	-.1798	1.0000	.1297	.2445	-.2591	-.2159
	(52)	(0)	(52)	(52)	(52)	(52)
	P= .101	P= .	P= .180	P= .040	P= .032	P= .062
SEX	-.0307	.1297	1.0000	.0125	-.3720	-.2606
	(52)	(52)	(0)	(52)	(52)	(52)
	P= .414	P= .180	P= .	P= .465	P= .003	P= .031
TOTDX	-.3298	.2445	.0125	1.0000	-.1464	-.3024
	(52)	(52)	(52)	(0)	(52)	(52)
	P= .008	P= .040	P= .465	P= .	P= .150	P= .015
PWBD8M	.0755	-.2591	-.3720	-.1464	1.0000	.7210
	(52)	(52)	(52)	(52)	(0)	(52)
	P= .297	P= .032	P= .003	P= .150	P= .	P= .000
LOFD8M	.2132	-.2159	-.2606	-.3024	.7210	1.0000
	(52)	(52)	(52)	(52)	(52)	(0)
	P= .065	P= .062	P= .031	P= .015	P= .000	P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

PEARSON CORRELATION COEFFICIENTS:
Between Hardiness, Demographics, & Level of Functioning Variables

	HARDINES	AGE	SEX	TOTDX	OOB8M
HARDINES	1.0000	-.1798	-.0307	-.3298	-.0324
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .101	P= .414	P= .008	P= .410
AGE	-.1798	1.0000	.1297	.2445	-.2108
	(52)	(0)	(52)	(52)	(52)
	P= .101	P= .	P= .180	P= .040	P= .067
SEX	-.0307	.1297	1.0000	.0125	-.3808
	(52)	(52)	(0)	(52)	(52)
	P= .414	P= .180	P= .	P= .465	P= .003
TOTDX	-.3298	.2445	.0125	1.0000	-.3449
	(52)	(52)	(52)	(0)	(52)
	P= .008	P= .040	P= .465	P= .	P= .006
OOB8M	-.0324	-.2108	-.3808	-.3449	1.0000
	(52)	(52)	(52)	(52)	(0)
	P= .410	P= .067	P= .003	P= .006	P= .
PWBF8M	.1228	-.2406	-.3854	-.2310	.7827
	(52)	(52)	(52)	(52)	(52)
	P= .193	P= .043	P= .002	P= .050	P= .000
LOFF8M	.1628	-.1218	-.3205	-.3498	.6483
	(52)	(52)	(52)	(52)	(52)
	P= .124	P= .195	P= .010	P= .006	P= .000
HCHAIR8M	-.1909	-.1129	-.3917	-.1955	.6442
	(52)	(52)	(52)	(52)	(52)
	P= .088	P= .213	P= .002	P= .082	P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

PEARSON CORRELATION COEFFICIENTS:
Between Hardiness, Demographics, & Level of Functioning Variables

	PWBF8M	LOFF8M	HCHAIR
HARDINES	.1228	.1628	-.1909
	(52)	(52)	(52)
	P= .193	P= .124	P= .088
AGE	-.2406	-.1218	-.1129
	(52)	(52)	(52)
	P= .043	P= .195	P= .213
SEX	-.3854	-.3205	-.3917
	(52)	(52)	(52)
	P= .002	P= .010	P= .002
TOTDX	-.2310	-.3498	-.1955
	(52)	(52)	(52)
	P= .050	P= .006	P= .082
OOB8M	.7827	.6483	.6442
	(52)	(52)	(52)
	P= .000	P= .000	P= .000
PWBF8M	1.0000	.7631	.5444
	(0)	(52)	(52)
	P= .	P= .000	P= .000
LOFF8M	.7631	1.0000	.5608
	(52)	(0)	(52)
	P= .000	P= .	P= .000
HCHAIR8M	.5444	.5608	1.0000
	(52)	(52)	(0)
	P= .000	P= .000	P= .

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Level Of Functioning & Activity Dependent Variables

	OOB8M	PWBD8M	PWBF8M	LOFD8M	LOFF8M	HCHAIR8M
OOB8M	1.0000	.5878	.7827	.5753	.6483	.6442
	(0)	(52)	(52)	(52)	(52)	(52)
	P= .	P= .000	P= .000	P= .000	P= .000	P= .000
PWBD8M	.5878	1.0000	.6765	.7210	.5187	.4435
	(52)	(0)	(52)	(52)	(52)	(52)
	P= .000	P= .	P= .000	P= .000	P= .000	P= .000
PWBF8M	.7827	.6765	1.0000	.7200	.7631	.5444
	(52)	(52)	(0)	(52)	(52)	(52)
	P= .000	P= .000	P= .	P= .000	P= .000	P= .000
LOFD8M	.5753	.7210	.7200	1.0000	.7854	.5583
	(52)	(52)	(52)	(0)	(52)	(52)
	P= .000	P= .000	P= .000	P= .	P= .000	P= .000
LOFF8M	.6483	.5187	.7631	.7854	1.0000	.5608
	(52)	(52)	(52)	(52)	(0)	(52)
	P= .000	P= .000	P= .000	P= .000	P= .	P= .000
HCHAIR8M	.6442	.4435	.5444	.5583	.5608	1.0000
	(52)	(52)	(52)	(52)	(52)	(0)
	P= .000	P= .000	P= .000	P= .000	P= .000	P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

PEARSON CORRELATION COEFFICIENTS:
Between Hardiness, Complaint Dependent & Indicator Variables.

	HARDINES	OPPA8M	OPPADR8M	OPA8M	OPADR8M
HARDINES	1.0000	-.0539	-.1303	-.0170	.1014
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .352	P= .179	P= .452	P= .237
OPPA8M	-.0539	1.0000	.4514	.1820	-.0087
	(52)	(0)	(52)	(52)	(52)
	P= .352	P= .	P= .000	P= .098	P= .476
OPPADR8M	-.1303	.4514	1.0000	-.1741	-.1718
	(52)	(52)	(0)	(52)	(52)
	P= .179	P= .000	P= .	P= .109	P= .112
OPA8M	-.0170	.1820	-.1741	1.0000	.5763
	(52)	(52)	(52)	(0)	(52)
	P= .452	P= .098	P= .109	P= .	P= .000
OPADR8M	.1014	-.0087	-.1718	.5763	1.0000
	(52)	(52)	(52)	(52)	(0)
	P= .237	P= .476	P= .112	P= .000	P= .
DZ8M	-.0658	.2917	.1786	.2037	.0479
	(52)	(52)	(52)	(52)	(52)
	P= .322	P= .018	P= .103	P= .074	P= .368
DZDR8M	-.3856	.1927	.3223	.0713	-.0584
	(52)	(52)	(52)	(52)	(52)
	P= .002	P= .086	P= .010	P= .308	P= .341
TI8M	-.1819	.1802	.0026	.3373	.0404
	(52)	(52)	(52)	(52)	(52)
	P= .098	P= .101	P= .493	P= .007	P= .388
TIDR8M	-.2633	-.0065	.0862	-.0987	-.0748
	(52)	(52)	(52)	(52)	(52)
	P= .030	P= .482	P= .272	P= .243	P= .299
OC8M	-.3030	.3420	.0586	.1657	-.0322
	(52)	(52)	(52)	(52)	(52)
	P= .014	P= .007	P= .340	P= .120	P= .410
OCDR8M	-.1168	.1455	.1630	.0290	-.0569
	(52)	(52)	(52)	(52)	(52)
	P= .205	P= .152	P= .124	P= .419	P= .344

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Complaint Dependent & Indicator Variables.
(Continued)

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M	OCDR8M
HARDINES	-.0658	-.3856	-.1819	-.2633	-.3030	-.1168
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .322	P= .002	P= .098	P= .030	P= .014	P= .205
OPPA8M	.2917	.1927	.1802	-.0065	.3420	.1455
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .018	P= .086	P= .101	P= .482	P= .007	P= .152
OPPADR8M	.1786	.3223	.0026	.0862	.0586	.1630
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .103	P= .010	P= .493	P= .272	P= .340	P= .124
OPA8M	.2037	.0713	.3373	-.0987	.1657	.0290
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .074	P= .308	P= .007	P= .243	P= .120	P= .419
OPADR8M	.0479	-.0584	.0404	-.0748	-.0322	-.0569
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .368	P= .341	P= .388	P= .299	P= .410	P= .344
DZ8M	1.0000	.3134	.2744	-.1137	.0557	-.0151
	(0)	(52)	(52)	(52)	(52)	(52)
	P= .	P= .012	P= .025	P= .211	P= .347	P= .458
DZDR8M	.3134	1.0000	.1315	.2785	.2143	.3879
	(52)	(0)	(52)	(52)	(52)	(52)
	P= .012	P= .	P= .176	P= .023	P= .064	P= .002
TI8M	.2744	.1315	1.0000	.2432	.2287	.2219
	(52)	(52)	(0)	(52)	(52)	(52)
	P= .025	P= .176	P= .	P= .041	P= .052	P= .057
TIDR8M	-.1137	.2785	.2432	1.0000	-.0321	.0909
	(52)	(52)	(52)	(0)	(52)	(52)
	P= .211	P= .023	P= .041	P= .	P= .411	P= .261
OC8M	.0557	.2143	.2287	-.0321	1.0000	.3270
	(52)	(52)	(52)	(52)	(0)	(52)
	P= .347	P= .064	P= .052	P= .411	P= .	P= .009
OCDR8M	-.0151	.3879	.2219	.0909	.3270	1.0000
	(52)	(52)	(52)	(52)	(52)	(0)
	P= .458	P= .002	P= .057	P= .261	P= .009	P= .

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Complaint Dependent & Indicator Variables.
(Continued)

	HARDINES	OPPA8M	OPPADR8M	OPA8M	OPADR8M
NONDRS8M	-.1616	.7326	.1985	.5072	.1985
	(52)	(52)	(52)	(52)	(52)
	P= .126	P= .000	P= .079	P= .000	P= .079
DRS8M	-.2078	.2166	.3729	.3750	.5462
	(52)	(52)	(52)	(52)	(52)
	P= .070	P= .061	P= .003	P= .003	P= .000
TOTCOM8M	-.1851	.7040	.2493	.5293	.2815
	(52)	(52)	(52)	(52)	(52)
	P= .095	P= .000	P= .037	P= .000	P= .022

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M
NONDRS8M	.5627	.3256	.5529	-.0110	.5289
	(52)	(52)	(52)	(52)	(52)
	P= .000	P= .009	P= .000	P= .469	P= .000
DRS8M	.2545	.5752	.2025	.2050	.1664
	(52)	(52)	(52)	(52)	(52)
	P= .034	P= .000	P= .075	P= .072	P= .119
TOTCOM8M	.5572	.4022	.5386	.0282	.5101
	(52)	(52)	(52)	(52)	(52)
	P= .000	P= .002	P= .000	P= .421	P= .000

	OCDR8M	NONDRS8M	DRS8M	TOTCOM8M
NONDRS8M	.2271	1.0000	.4283	.9857
	(52)	(0)	(52)	(52)
	P= .053	P= .	P= .001	P= .000
DRS8M	.4879	.4283	1.0000	.5743
	(52)	(52)	(0)	(52)
	P= .000	P= .001	P= .	P= .000
TOTCOM8M	.2966	.9857	.5743	1.0000
	(52)	(52)	(52)	(0)
	P= .016	P= .000	P= .000	P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Hardiness, Complaint Dependent & Indicator Variables.
(Continued)

	NONDRS8M	DRS8M	TOTCOM8M
HARDINES	-.1616	-.2078	-.1851
	(52)	(52)	(52)
	P= .126	P= .070	P= .095
OPPA8M	.7326	.2166	.7040
	(52)	(52)	(52)
	P= .000	P= .061	P= .000
OPPADR8M	.1985	.3729	.2493
	(52)	(52)	(52)
	P= .079	P= .003	P= .037
OPA8M	.5072	.3750	.5293
	(52)	(52)	(52)
	P= .000	P= .003	P= .000
OPADR8M	.1985	.5462	.2815
	(52)	(52)	(52)
	P= .079	P= .000	P= .022
DZ8M	.5627	.2545	.5572
	(52)	(52)	(52)
	P= .000	P= .034	P= .000
DZDR8M	.3256	.5752	.4022
	(52)	(52)	(52)
	P= .009	P= .000	P= .002
TI8M	.5529	.2025	.5386
	(52)	(52)	(52)
	P= .000	P= .075	P= .000
TIDR8M	-.0110	.2050	.0282
	(52)	(52)	(52)
	P= .469	P= .072	P= .421
OC8M	.5289	.1664	.5101
	(52)	(52)	(52)
	P= .000	P= .119	P= .000
OCDR8M	.2271	.4879	.2966
	(52)	(52)	(52)
	P= .053	P= .000	P= .016

(COEFFICIENT / (CASES) / 1-TAILED SIG)
" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Age, Patient Complaint Dependent & Indicator Variables

	AGE	OPPA8M	OPPADR8M	OPA8M	OPADR8M
AGE	1.0000	-.3646	-.3044	-.0523	-.0383
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .004	P= .014	P= .356	P= .394

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M
AGE	.0110	-.0089	.1044	.1905	-.1139
	(52)	(52)	(52)	(52)	(52)
	P= .469	P= .475	P= .231	P= .088	P= .211

	OCDR8M	NONDRS8M	DRS8M	TOTCOM8M
AGE	.0690	-.1479	-.0723	-.1475
	(52)	(52)	(52)	(52)
	P= .313	P= .148	P= .305	P= .148

PEARSON CORRELATION COEFFICIENTS:
Between Sex, Complaint & Indicator Variables.

	SEX	OPPA8M	CPPADR8M	OPA8M	OPADR8M
SEX	1.0000	.0246	.0169	-.0983	.2073
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .431	P= .453	P= .244	P= .070

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M
SEX	.2347	-.0237	-.0174	.0487	-.0070
	(52)	(52)	(52)	(52)	(52)
	P= .047	P= .434	P= .451	P= .366	P= .480

	OCDR8M	NONDRS8M	DRS8M	TOTCOM8M
SEX	.0714	.1285	.2626	.1654
	(52)	(52)	(52)	(52)
	P= .307	P= .182	P= .030	P= .121

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Length of Stay, Complaint Dependent & Indicator Variables.

	LOSPO	OPPA8M	OPPADR8M	OPA8M	OPADR8M
LOSPO	1.0000	.1093	.1238	.0907	.0889
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .220	P= .191	P= .261	P= .266

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M
LOSPO	.0554	.2509	.3791	.0213	.4528
	(52)	(52)	(52)	(52)	(52)
	P= .348	P= .036	P= .003	P= .440	P= .000

	OCDR8M	NONDRS8M	DRS8M	TOTCOM8M
LOSPO	.5874	.3268	.3734	.3656
	(52)	(52)	(52)	(52)
	P= .000	P= .009	P= .003	P= .004

PEARSON CORRELATION COEFFICIENTS: Between Total Diagnoses, Complaint Dependent & Indicator Variables.

	TOTDX	OPPA8M	OPPADR8M	OPA8M	OPADR8M
TOTDX	1.0000	.0407	-.0767	.0984	.2286
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .387	P= .295	P= .244	P= .052

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M	OCDR8M
TOTDX	-.0775	.0500	.0126	-.0930	.4694	.2839
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .292	P= .362	P= .465	P= .256	P= .000	P= .021

	NONDRS8M	DRS8M	TOTCOM8M
TOTDX	.1392	.2132	.1658
	(52)	(52)	(52)
	P= .163	P= .065	P= .120

P E A R S O N C O R R E L A T I O N C O E F F I C I E N T S:
Between Total Complications, Complaint Dependent & Indicator Variables.

	TOTCOMP	OPPA8M	OPPADR8M	OPA8M	OPADR8M
TOTCOMP	1.0000	-.0679	.0271	.0074	.1497
	(0)	(52)	(52)	(52)	(52)
	P= .	P= .316	P= .424	P= .479	P= .145

	DZ8M	DZDR8M	TI8M	TIDR8M	OC8M	OCDR8M
TOTCOMP	-.0701	.0114	.2514	-.0845	.1937	.2475
	(52)	(52)	(52)	(52)	(52)	(52)
	P= .311	P= .468	P= .036	P= .276	P= .084	P= .038

TOTCOMP	.0863	.2104	.1174
	(52)	(52)	(52)
	P= .271	P= .067	P= .204

APPENDIX H

T-TESTS:

COMPLAINTS OFFERED TO PHYSICIANS VERSUS NON-PHYSICIANS

Below are the results of the T-tests comparing the 8 day mean number of complaints offered to physicians versus those offered to non-physicians. The categories of complaint are:

- o All complaints (DRS8M vs. NONDRS8M)
- o Emotional complaints (OCDR8M vs. OC8M)
- o Complaints of Fatigue (TIDR8M vs. TI8M)
- o Complaints of Dizziness (DZDR8M vs. DZ8M)
- o Complaints of Post-operative Pain (OPADR8M vs. OPA8M)
- o Complaints of Other Pain (OPPADR8M vs. OPPA8M)

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
DRS8M	52	0.2404	0.281	0.039
NONDRS8M	52	2.2452	1.367	0.190

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-2.0048	1.272	0.176	* 0.428	0.002 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-11.37	51	0.000

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OCDR8M	52	0.0385	0.094	0.013
OC8M	52	0.2115	0.267	0.037

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-0.1731	0.253	0.035	* 0.327	0.018 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-4.94	51	0.000

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
TIDR8M	52	0.0072	0.038	0.005
TI8M	52	0.2139	0.258	0.036

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-0.2067	0.251	0.035	* 0.243	0.082 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-5.94	51	0.000

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
DZDR8M	52	0.0288	0.095	0.013
DZ8M	52	0.1082	0.182	0.025

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
-0.0793	0.177	0.025	* 0.312	0.024 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-3.24	51	0.002

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OPADR8M	52	0.0601	0.154	0.021
OPA8M	52	0.1514	0.293	0.041

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-0.0913	0.240	0.033	* 0.576	0.000 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-2.74	51	0.008

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OPPADR8M	52	0.0433	0.089	0.012
OPPA8M	52	1.0649	0.685	0.095

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-1.0216	0.650	0.090	* 0.451	0.001 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-11.34	51	0.000

T-TESTS:SECOND SET

As described in Chapter III, a second set of T-tests was also run. Here the number of complaints offered to non-physicians was divided by 3 to partially control for the non-physicians having more frequent contact with the patients, than do the physicians. The comparisons were made for the same categories of complaints included in the first set of T-tests above. The results of the second set of T-tests follow.

- T - T E S T - - - - - - - - - - - - - - - - - -

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
DRS7M	52	0.2404	0.281	0.039
ONDRS7M	52	0.7484	0.456	0.063

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB. *
-0.5080	0.420	0.058	* 0.428	0.002 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-8.71	51	0.000

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OCDR7M	52	0.0385	0.094	0.013
AOC7M	52	0.0705	0.089	0.012

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
-0.0321	0.107	0.015	* 0.327	0.018 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-2.17	51	0.035

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- T - T E S T - - - - - - - - - - - - - - - - -

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
TIDR7M	52	0.0072	0.038	0.005
ATI7M	52	0.0713	0.086	0.012

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
-0.0641	0.085	0.012	* 0.243	0.082 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-5.43	51	0.000

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
DZDR7M	52	0.0288	0.095	0.013
ADZ7M	52	0.0361	0.061	0.008

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
-0.0072	0.095	0.013	* 0.313	0.024 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-0.55	51	0.587

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VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OPADR7M	52	0.0601	0.154	0.021
AOPA7M	52	0.0505	0.098	0.014

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
0.0096	0.126	0.017	* 0.576	0.000 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
0.55	51	0.584

- T - T E S T - - - - - - - - - - - - - - - - -

VARIABLE	NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR
OPPADR7M	52	0.0433	0.089	0.012
AOPPA7M	52	0.3550	0.228	0.032

(DIFFERENCE) MEAN	STANDARD DEVIATION	STANDARD ERROR	* CORR.	2-TAIL PROB.
-0.3117	0.204	0.028	* 0.451	0.001 *

T VALUE	DEGREES OF FREEDOM	2-TAIL PROB.
-11.01	51	0.000

REFERENCES

Admissions Director - Hospital X. Personal Communication. 1986.

Aegerter, E. & Kirkpatrick, J.A. Orthopaedic Diseases: Physiology, Pathology, Radiology. Philadelphia, Penn.: W.B. Saunders, 1975.

Alexander, F. Psychological Aspects of Medicine. Psychosomatic Medicine, 1939, 1.

Alpert, J.J. Broken Appointments. Pediatrics, 1964, 34.

Andrews, G. A Prospective Study of Life Events and Psychological Symptoms. Psych. Med., 1981, 11.

Antonovsky, A. Health, Stress, and Coping. Washington: Jossey-Bass, 1979.

Bales, R.F., Cohen, S.P., & Williamson, S. A. SYMLOG, A System for the Multiple Level Observation of Groups. N.Y.: The Free Press, 1979.

Bard, Morton. Personal Communication. 1985.

Bard, M. & Sutherland, A.M. Psychological Impact of Cancer and Its Treatment. Cancer, 1955, 8.

Bard, M. & Sutherland, A.M. Adaptation To Radical Mastectomy. In: The Psychological Impact of Cancer. Amer. Cancer Soc., 1978.

Barondess, J.A. The Clinical Transaction: Themes and Descants. Perspectives in Biology & Medicine, 1983, 27(1).

Becker, M.H. & Maiman, L.A. Sociobehavioral Determinants of Compliance With Health and Medical Care Recommendations. Med. Care, 1975, 13.

Benjamin, S. Stressful Life Events Preceding the Onset of Neurotic Depression. Psych. Med.,1981, 11.

Bergersen, B.S. Pharmacology In Nursing. St. Louis: C.V. Mosby Co., 1979.

Blum, R.H. The Psychology of Malpractice Suits. San Francisco: Califonia Medical Association, 1957.

Blumenthal, J.A., Williams, S., Wallace, A.G., Williams, R.B. & Needles, T.L. Physiological and Psychological Variables Predict Compliance to

Prescribed Exercise Therapy in Patients Recovering from Myocardial Infarctions. Psycho. Med., 1983, 44.

Bohrnstedt, J. & Knoke, K. Statistics For Social Data Analysis. Englewood Cliffs, N.J.: Prentice-Hall, 1982.

Brashear, H.R. & Raney, R.B. Shand's Handbook of Orthopaedic Surgery. St. Louis, Mo.: C.V. Mosby, 1978.

Byrne, D.G. Effects Of Social Context On Psychological Responses To Survived Myocardial Infarction. Int'l J. Psychia. In Med. 1980-81, 10.

Byrne, D.G. & Whyte, H.M. Life Events & Myocardial Infarction Revisited: The Role of Measures of Individual Impact. Psychoso. Med., 1980,42.

Chambers, M. Psychological Aspects Of Renal Transplantation. Int'l J. Psychia. In Med. 1982-83, 12.

Cobb, S. A Model for Life Events and Their Consequences. In: Dohrenwend, B.S. & Dohrenwend, B.P. Stressful Life Events: Their Nature and Effects. N.Y.: J. Wiley & Sons, 1974.

Cobb, S. Social Support As A Moderator of Life Stress. Psychosomatic Med., 1976, 38.

Cobb, S. & Lindemann, E. Coconut Grove Burns: Neuropsychiatric Observations. Annals of Surgery, 1943, 117.

Cohen, F. & Lazarus, R.S. Coping with the Stress of Illness. In: G.C. Stone, et al, Eds. Health Psychology: A Handbook. San Francisco : Jossey-Bass, 1980.

Cohen, J. & Cohen, P. Applied Multiple regression/ Correlation Analysis For The Behavioral Science. Hillsdale, N.J.: Lawrence Erlbaum, Assoc., 1975.

Davis, M.S. Physiologic, Psychologic and Demographic Factors In Patient Compliance With Doctors' Orders. Med. Care, 1968, 6.

Davis, M.S. Variations In Patients' Compliance With Doctors' Advice: An Empirical Analysis of Patterns of Communication. A.J.P.H., 1968, 58.

DeGood, D.E. Cognitive Control Factors In Vascular Stress Responses. Psychophysiology, 1975, 12.

DiMatteo, M.R., Prince, L.M. & Taranta, A. Patients' Perceptions of Physicians' Behavior: Determinants of Patient Commitment To The Therapeutic Relationship. J. of Comm. Health. 1979, 4.

DiMatteo, M.R. A Social Psychological Analysis Of Physician-Patient Rapport: Toward A Science Of The Art Of Medicine. J. of Social Issues, 1979, 35.

Dirks, J.F., Schraa, J.C. & Robinson, S.K. Patient Mislabeling of Symptoms: Implications For Patient-Physician Communication And Medical Outcomes. Int'l. J. of Psychia. In Med.. 1982, 12.

Dohrenwend, B.S. Life Events as Stressors: A Methodological Inquiry. J. of Health & Soc. Beh., 1973, 14.

Downie, W.W., et al. Studies With Pain Rating Scales. Annals of the Rheumatic Diseases, 1978, 37.

Dunleavy, J. Chief Physical Therapist, St. Luke's-Roosevelt Hospital Center. Personal Communication, 1985.

Egbert, L.D., Batit, G.E., Welch, C.E. & Bartlett, M.K. Reduction of Post-Operative Pain By Encouragement and Instruction of Patients. New Engl. J. of Med. 1964, 270.

Feldman, R. Hardiness As A Predictor of Coping In Hi-Risk Pregnancies (working title). Doctoral Dissertation - City University of New York, 1989.

Francis, V., Korsch, B.M. & Morris, M.J. Gaps In Doctor-Patient Communication: Patients Response To Medical Advice. New Engl. J. of Med., 1969, 280.

Freidenbergs, I., et al. Psychological Aspects Of Living With Cancer: A Review Of The Literature. Int'l. J. Psychia. In Med., 1981-82, 11.

Friedman, H.S. & DiMatteo, M.R. Healthcare As An Interpersonal Process. J. of Social Issues, 1979, 35.

Garrity, T.F., et al. The Relationship of Recent Life Change To Seriousness of Later Illness. J. of Psychoso. Res., 1978, 22.

Goffman, E. Asylums. Garden City, N.Y.: Doubleday, 1961.

Goldstein, L.A. & Dickerson, R.C. Atlas Of Orthopaedic Surgery. St. Louis, Mo.: C.V. Mosby, 1981.

Grant, I., et al. Patterns In The Relationship Of Life Events and Psychiatric Symptoms Over Time. J. of Psychoso. Res., 1978, 22.

Greene, W.A., Jr., et al. Psychological Factors and Reticuloendothelial Disease: II. Observations On A Group of Women With Lymphomas and Leukemiaa. Psychoso. Med., 1956, 28.

Greene, W.A., Jr. & Miller, G. Psychological Factors and Reticuloendothelial Disease: IV. Observations On A Group of Children and Adolescents with Leukemia. Psychoso. Med., 1958, 20.

Hahn, M.E. California Life Goals Evaluation Schedule. Palo Alto, Calif.: Western Psychological Services, 1966.

Halpern, L.M. Drugs in the Management of Pain: Pharmacology and Appropriate Strategies for Clinical Utilization. In: Benedetti, C., et al. Advances In Pain Research. N.Y., N.Y.: Raven Press, 1984.

Hospitals Prepared Have Fewer Fears. October 1, 1979.

Hudgens, R.W. Personal Catastrophy & Depression: A Consideration of the Subject With Respect to Medically Ill Adolescents, And A Requiem for Retrospective Life Event Studies. In: Dohrenwend, B.S. & Dohrenwend, B.P.. Stressful Life Events: Their Nature and Effects. N.Y.: J. Wiley & Sons, 1974.

Hulka, B.S., Kupper, L.L., Daly, M.B. & Cassel, J.C. Correlates Of Satisfaction And Dissatisfaction With Medical Care: A Community Perspective. Medical Care, 1975, 13.

Jacobs, T.J. & Charles, E. Life Events and the Occurrence of Cancer in Children. Psychoso. Med., 1980, 42.

Janis, I.L. Psychological Stress. New York: Wiley, 1958.

Janis, I.L. Psychological Stress: Psychoanalytic and Behavioral Studies of Surgical Patients. N.Y.: Academic Press, 1974.

Kasl, S.V. Chapter 31. Social and Psychological Factors Affecting The Course Of Disease: An Epidemiological Perspective. In D. Mechanic (Ed.), Handbook of Health, Healthcare, and Health Professions. N.Y.: Free Press, 1983.

Kasteler, J., Kane, R.L., Olsen, D.M. & Thetford, C. Issues Underlying Prevalence Of Doctor Shopping Behavior. J. of Health & Soc. Beh., 1976, 17.

Kobasa, S.C. Stressful Life Events, Personality, and Health: An Inquiry Into Hardiness. JPSP, 1979, 37.

Kobasa, S.C. & Maddi, S.R. Existential Personality Theory. In Corsini, R. (Ed.), Current Personality Theories. Itasca, Ill.: Peacock, 1977.

Kobasa, S.C., Maddi, S.R. & Courington, S. Personality and Constitution As Mediators In The Stress-Illness Relationship. J. ofHealth & Soc. Beh., 1981, 22.

Kobasa, S.C., Maddi, S.R, & Kahn, S. Hardiness and Health: A Prospective Study. JPSP, 1982, 42.

Kobasa, S.C., Maddi, S.R & Puccetti, M.C. Personality and Exercise As Buffers In The Stress-Illness Relationship. J. of Beh. Med., 1982, 5.

Kobasa, S.C. & Puccetti, M.C. Personality and Social Resources In Stress Resistance. JPSP. 1983, 45.

Kobasa, S.C. Personal Communication. 1985.

Krantz, K.S., Glass, D.C. & Snyder, M.L. Helplessness, Stress Level, and the Coronary-Prone Behavior Pattern. J. of Exper. Soc. Psych. 1974, 10.

Kulik, J.A. & Mahler, H.I.M. Preoperative Room Assignment and Social Comparison: Effect On Preoperative Anxiety and Recovery From Coronary Bypass Surgery. In Press.

Lazarus, R.S. & Launier, R. Stress-related Transactions Between Persons and Environment. In: Pervin, L.A. & Lewis, M. Perspectives In Interactional Psychology. N.Y.: Plenum Press, 1978.

Levenson, H. Differentiating Among Internality, Powerful Others, And Change. In: Lefcourt, H.M., Research With The Locus Of Control Construct: Volume 1 Assessment Methods. N.Y.: Academic Press, 1981.

Leventhal, H. & Hirschman, R.S. Chapter 7: Social Psychology and Prevention. In: Sanders, G.S. & Suls, J., Social Psychology of Health and Illness. Hillsdale, N.J.: Erlbaum, Assoc., 1982.

Leventhal, H. Chapter 32: Psychology In Healthcare. In: Mechanic, David (Ed.), Handbook of Health, Healthcare, and Health Professions. N.Y.: Free Press, 1983.

Lewis, F.M. & Bloom, J.R. Psychosocial Adjustment To Breast Cancer: A Review Of Selected Literature. Int'l J. of Psychia. In Med., 1978-79, 9.

Maddi, S.R. & Kobasa, S.C. The Hardy Executive: Health Under Stress. Homewood, Ill.: Dow Jones-Irwin, 1984.

Maddi, S.R., Kobasa, S.C. & Hoover, M. An Alienation Test. J. of Humanistic Psychology, 1979, 19.

Malcolm, A.H. Fear of Malpractive Suits Spurring Some Doctors to Leave Obstetrics New York Times, Feb. 12, 1985.

Malcolm, A.H. Doctors Prepare Attack On Suits For Malpractice. New York Times, Feb. 15, 1985.

Manuck, S.B., Hinricksen, J.J. & Roos, E. Life Stress, Locus Of Control, And State And Trait Anxiety. Psych. Rep., 1978, 36.

Marston M. Compliance With Medical Regimens: A Review Of The Literature. Nursing Research, 1970, 19.

McCall, R. Fundamental Statistics For Psychologists Hillsdale, N.J.: Lawrence Erlbaum, Assoc., 1975.

McPhee, S.J., et al. Influence Of A Discharge Interview On Patient Knowledge, Compliance, And Functional Status After Hospitalization. Medical Care, 1983, 21.

Mechanic, David. Response Factors In Illness: The Study of Illness Behavior. Soc. Psychia., 1966,1.

Mechanic, David. Social Psychologic Factors Affecting The Presentation of Bodily Complaints. New Eng. J. of Med., 1972, 286.

Mechanic, David. The Stability of Health and Illness Behavior: Results from A 16 Year Follow-Up. A.J.P.H., 1979, 69.

Mechanic, David. The Experience and Expression of Distress: The Study of Illness Behavior and Medical Utilization. In: Mechanic, David (Ed.), Handbook of Health Healthcare, and Health Professions, N.Y.: Free Press, 1983.

Mechanic, David (Ed.) Handbook of Health Healthcare, and Health Professions, N.Y.: Free Press, 1983.

Melzack, R. The McGill Pain Questionnaire: Major Properties & Scoring Methods. Pain, 1975, 1.

Merkel, W.T. Physician Perception Of Patient Satisfaction: Do Doctors Know Which Patients Are Satisfied? Medical Care, 1984, 22.

Mueller, D.P., et al. Stressful Life Events and Psychiatric Symptomatology: Change or Undesirability? J. of Health and Soc. Beh., 1977, 18.

Parsons, T. The Social System. N.Y.: Free Press, 1951.

Rockwell, D.A. & Pepitone-Rockwell, F. The Emotional Impact Of Surgery Amd The Value Of The Informed Consent. Medical Clinics of North America, 1979, 63.

Rodin, J. & Janis, I.L. The Social Power Of Health-Care Practitioners As Agents Of Change. J. of Social Issues., 1979, 35.

Rogers, J., MacBride, A., Whylie, B. & Freeman, S.J.J. The Use Of Groups In The Rehabilitation Of Amputees. Int'l J. of Psychia. In Med., 1977-78, 8.

Rotter, J.B. Social Learning And Clinical Psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1954.

Rotter, J.B. Generalized Expectancies For Internal Vs. External Control Of Reinforcement. Psych. Mono., 1966, 80.

Rotter, J.B., Seaman, M. & Liverant, S. Internal Vs. External Locus of Control Of Reinforcement: A Major Variable In Behavior Theory. In: N.F. Washburne (Ed.), Decisions, Values, And Groups. London: Pergamon, 1962.

Seligman, M.E. Helplessness. San Francisco: Freeman, 1975.

Selye, Hans. The Stress of Life. N.Y.: McGraw-Hill, 1976.

Shaffer, F.A.(Ed.) DRGs:Changes and Challenges. N.Y.: Nat'l League for Nursing, 1984.

Simms, G.R. & Long, D.M. The Whole Is More Than The Sum Of The Parts. Current Surgery, 1979, 36.

Starr, P. The Social Transformation of American Medicine N.Y.: Basic Books, Inc., 1982.

Stiles, W.B. Discourse Analysis And The Doctor-Patient Relationship. Int'l. J. of Psychia. In Med., 1979, 9.

Stone, G.C. Patient Compliance And The Role Of The Expert. J. of Social Issues, 1979, 35.

Strickland, B.R. Internal-external Expectancies And Health Related Behaviors. J. of Con. & Clin. Psych., 1978, 46.

Sutherland, A.M. & Orbach, C.E. Depresssive Reactions Associated with Surgery for Cancer. In: The Psych. Impact of Cancer. American Cancer Society, 1978.

Sutherland, A.M., Orbach, C.E., Dyk, R.B. & Bard, M. Adaptation to the Dry Colostomy: Preliminary Report and Summary of Findings. Cancer, 1952, 5.

Syrjala, K.L. & Chapman, R.C. Measurement of Clinical Pain: A Review And Integration Of Research Findings. In: Benedetti, C., et al (Eds.), Advances In Pain Research And Therapy, Vol. 7. N.Y.: Raven Press, 1984.

Szasz, T. & Hollender, M.H. A Contribution To The Philosophy Of Medicine: The Basic Models of The Doctor-Patient Relationship. Archives of Internal Medicine, 1956, 97.

Tausig, M. Measuring Life Events. J. of Health and Soc. Beh., 1982, 23.

Taylor, S.E. Hospital Patient Behavior: Reactance, Helplessness, or Control. J. of Social Issues, 1979, 35.

Thomas, L. Notes of a biology watcher - on magic in medicine. New Eng. J. of Med., 1978, 299.

Totman, R. What Makes Life Events Stressful? A Retrospective Study of Patients Who Have Suffered A First Myocardial Infarction. J. of Psychoso. Res., 1979, 23.

Vachon, M.L.S., et al. The Effectiveness Of Psychosocial Support During Post-Surgical Treatment of Breast Cancer. Int'l. J. Psychia. In Med., 1981-82, 11.

Vanderplate, C. A Personal Adaptation Group For Burn Injured Hospital Patients. Int'l. J. Psychia. In Med., 1982-83, 12.

Walker, P.S. Human Joints And Their Artificial Replacements. Springfield, Ill.: C.C. Thomas, 1977.

Wallston, K.A. & Wallston, B.S. Health Locus Of Control Scales. In: Lefcourt, H.M. Research With The Locus Of Control Construct: Volume 1 Assessment Methods. N.Y.: Academic Press, 1981.

Webb, L.J., Snodgrass, D. & Thagard, J. Sex Diferences and Life Event Experiences. Psych. Rep., 1978, 43.

Weiner, M. & Skipper, F.P., Jr. Eiglycemia: A Psychological Study. Int'l. J. Psychia. In Med., 1978-79, 9.

Welkowitz, E, et al. Intro. Statistics For The Behavioral Sciences. N.Y.: Academic Press, 1971.

Winer, A. Statistical Principles In Experimental Design (2nd ed.). N.Y.: McGraw-Hill, 1971.

Wortman, C.B. Social Support and The Cancer Patient. Cancer, 1984, 53.

Wortman, C.B. & Dunkel-Schetter, C. Interpersonal Relationships and Cancer: A Theoretical Analysis. J. of Soc. Issues, 1979, 35.