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HEALTH LOCUS OF CONTROL AND HELPFULNESS OF
PRAYER IN PREOPERATIVE CARDIAC
SURGERY PATIENTS

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by

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ABSTRACT

→ Gaining knowledge about the individual's use of prayer as a coping mechanism in dealing with stressful situations can facilitate incorporating support of this mechanism into a plan of care for the patient.

Prayer is a tool of expression of the spiritual aspect (of the individual, and the need to acknowledge the spiritual aspect) is well supported in nursing literature. Little research is available, specifically addressing how the spiritual aspect of the individual is to be acknowledged.

→ The purpose of this study was to examine the relationship between health locus of control and helpfulness of prayer as a direct action coping mechanism in preoperative cardiac surgery patients. The Multi-dimensional Health Locus of Control Scales and The Helpfulness of Prayer Scale (developed by the researcher) were issued to 100 subjects 1 day prior to cardiac surgery. Ninety-six subjects indicated prayer was used as a coping mechanism in dealing with the stress of cardiac surgery and 70 of these subjects gave it the highest possible rating on the Helpfulness of Prayer Scale. Thus, no relationship was found to exist between health locus of control and helpfulness of prayer since individuals of each locus orientation perceived prayer to be helpful.

→ Findings suggest prayer is perceived as a helpful direct action coping mechanism and warrants support by nursing personnel. It is recommended that further research be done to study the relationship between use of prayer and coping to determine if prayer enhances the individual's ability to cope with stressful situations.

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CHAPTER I

Introduction

An estimated 200,000 people annually undergo coronary artery bypass grafting (CABG), which remains the major treatment for coronary occlusive disease, the leading cause of death in Western societies (Cooley, 1987). CABG surgery is generally accepted as a stressful event, requiring activation of the individual coping processes (Dubin, Field, & Gastfriend, 1979; Janis, 1958). The manner in which individuals view CABG surgery contributes to the stress experienced by the individual. The view of the heart as the center of emotion, produces vast emotional overtones (Cohen, 1982).

Individual control has been identified as a factor that alters the manner in which one appraises and reacts to a stressful situation (Johnson, Christman, & Stitt, 1985). Locus of control is a psychological concept that addresses individual control beliefs (Rotter, 1966). The locus of control construct has been further expanded to specifically address health related behaviors (Levenson, 1973; Wallston, Wallston, Kaplan, & Maides, 1976; Wallston, Wallston, & DeVillis, 1978).

The patient undergoing CABG surgery may also perceive the situation to be life threatening and may believe he dies during surgery because the heart is stopped (Cohen, 1982). "Stress appraisals include harm/loss, threat and challenge" (Lazarus & Folkman, 1984, p. 32). The anticipated harm or loss may be threatening to the patient awaiting CABG surgery, or the surgery may come to be viewed as more of a challenge

because of the potential gain to the individual with the increased oxygen supply to the heart muscle. "A situation that is appraised as more threatening than challenging can come to be appraised as more challenging than threatening because of cognitive coping efforts which enable the person to view the episode in a more positive light" (Lazarus & Folkman, 1984, p. 33). King (1984) found cardiac surgery to be appraised more as a challenge than as a threat in patients experiencing cardiac surgery. In addition, King reported that the appraisal of cardiac surgery as a challenge was positively correlated with use of direct action coping strategies and with an internal causality orientation. One direct action coping strategy reported by King was the use of prayer.

Prayer is a concept rarely addressed in scientific literature. Discussion of prayer is a sensitive issue considering its relationship to the spiritual aspect of the individual, which, according to Rogers (1970), is another dimension of the person. Nursing literature supports the significance of acknowledging the spiritual aspect of the individual (Beakman, 1981; Bruner, 1984; Conrad, 1985; Dickinson, 1975; Fish & Shelly, 1978; Harmon, 1985; Highfield & Cason, 1983; Hoover, 1986; Lucus, 1978; Piepgras, 1968; Peterson, 1985; Reed, 1986; Stoll, 1979). Prayer is generally recognized as a tool of expression of the spiritual aspect of the individual (Steindl-Rast, 1984). Prayer is as unique as the individual who uses it as a resource; thus, it is difficult to make operational. Nursing diagnoses have been identified to describe spiritual distress and give direction in nursing interventions (Carpenito, 1983). Nursing theorists specify the need to consider the spiritual aspect of the person if nursing practice is to include the whole person concept (Rogers, 1970; Roy, 1930; Chrisman & Fowler, 1980). Lazarus

(1966) addresses the importance of considering all individual methods in the coping process and indicates that existential beliefs provide the individual with an important resource.

"Knowledge about the relevant coping processes and the personality factors associated with them, could ultimately contribute to improved patient care; for example, it may be possible to intervene selectively with suitable communications designed to facilitate coping" (Cohen & Lazarus, 1973, p. 375). Examining the relationship between health locus of control and helpfulness of prayer in preoperative cardiac surgery patients is one way to gain knowledge about one coping mechanism and the personality factors associated with it. Chrisman and Fowler (1980) provide a framework to interrelate personality factors and use of coping mechanisms for patient caretakers.

Even though this issue has been addressed in general, specific studies identifying a means of intervention in relation to the spiritual resources of the individual are rare (Carson & Huss, 1979; Glick, 1986; Peck, 1981). Few studies scientifically addressing the helpfulness of prayer as an individual mechanism to deal with stressful situations have been reported (Benson, 1975; Fordyce, 1982; Stoll, 1985). No studies were found addressing the spiritual resources of the cardiac surgery patient.

Statement of Purpose

The purpose of this study was to examine the relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

Conceptual Framework

The conceptual basis for this study is derived from Chrisman and Fowler's Systems-in-Change Model (1980). Social learning theory (Rotter, 1966) and cognitive appraisal and coping (Lazarus, 1966) also serve as theoretical frameworks for the proposed research study.

Chrisman and Fowler's Systems-in-Change Model

Chrisman and Fowler have developed a framework for practice that views the individual as biologic, social, and personal systems interacting with each other as well as with the environment on a developmental continuum (Chrisman & Fowler, 1980) (see Figure 1). They report that disruptions inside or outside the system have an impact on the balance of the whole and produce stress. They indicate that each system must be evaluated to determine individual components that enable the person to return to a state of equilibrium. In relation to this model, cardiac surgery is a change in the environment that will produce stress for the individual and disrupt the state of equilibrium. Biologic changes occur in response to dealing with a stressful event (Selye, 1976). To achieve integrity with this disruption, one must assess the remaining systems for resources available to the individual. Each system influences individual appraisal of the stressful event. The personal system contains the individual personality characteristics which incorporate locus of control. Relating prayer to locus of control addresses the resources within the personal system of the individual. The spiritual view is a subset of the personal system that addresses the person's spiritual resources and incorporates prayer as a tool to regain equilibrium. Prayer could also be a resource of the religion component identified in the social system. Following assessment of all subsystems, the nursing diagnosis can be established and goals formulated including the spiritual

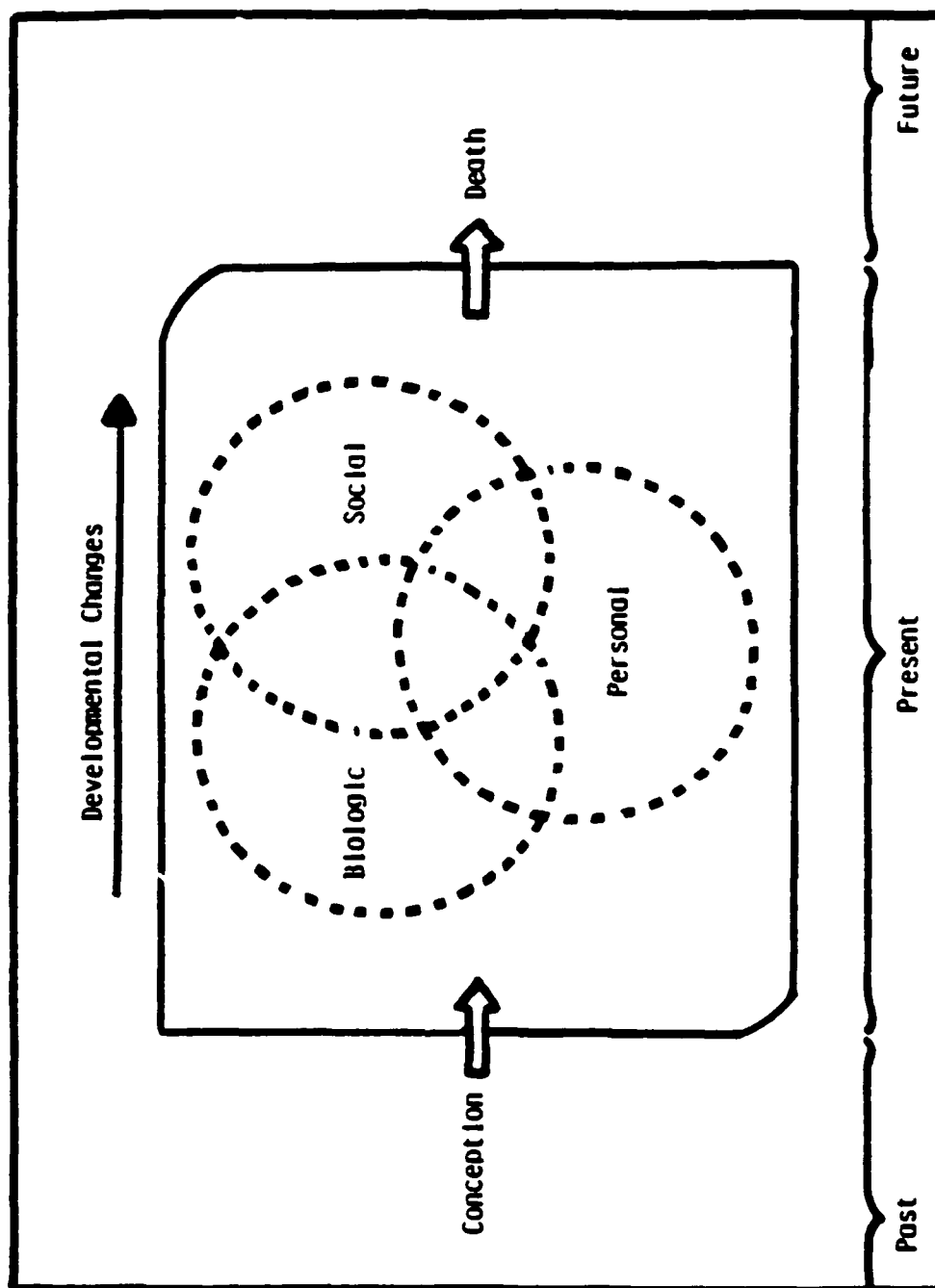


Figure 1. The Systems-in-Change Model

aspect, a component rarely addressed through the nursing process. Nursing cannot claim treatment of the whole person if the spiritual component is not addressed. Knowing more about the individual's use of prayer as a coping mechanism can facilitate incorporating support of prayer in the nursing care plan of patients anticipating cardiac surgery.

Social Learning Theory

Social learning theory combines several concepts in an effort to define unique and complex human behavior, thus addressing the variation in individual response to stress. Each experience an individual has influences other experiences (Rotter, Chance, & Phares, 1972). As individuals gain additional experience, their overall personality stabilizes. Behavior exhibited by this personality is goal-directed or motivated. The individual attempts to build upon the positive aspects of any situation. The individual's expectations influence whether a certain behavior will be exercised (Rotter et al.). An individual is constantly interacting with both internal and external aspects of the environment and thus receives reinforcement for behavior. "The potential for a behavior to occur in any specific psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement" (Rotter, 1975, p. 57). Behavioral practices of coping with stressful events through prayer stem from the expectancy that this behavior will achieve certain results.

One construct developed from social learning theory in relation to personality is locus of control orientation as either internal or external reinforcement. This construct is clarified as follows:

When reinforcement is perceived by the subject as following some action of his own but not being contingent upon his action, then, in our own culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as

unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted this way by the individual, we have labelled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control (Rotter, 1966, p. 1).

This construct has further been developed by Wallston et al. (1976) to address health specific behaviors. Multidimensional health locus of control scales "have been developed to tap beliefs that the source of reinforcement for health-related behaviors is primarily internal, a matter of chance or under the control of powerful others" (Wallston et al., 1978, p. 160).

Stress Appraisal and Coping

Lazarus and Folkman (1984) identify existential beliefs as significant factors contributing to the individual's manner of dealing with stress. Personal control beliefs are incorporated in work done by Lazarus (1966) in the development of his ideas relative to appraisal of stress and coping behaviors. Control beliefs are only one part of the individual makeup that contribute to primary appraisal of what may be perceived as a stressful situation. Following primary appraisal which is influenced by control beliefs as well as all other experiences the person brings to the situation, the individual then decides upon acceptable coping processes to deal with stress. Lazarus calls this secondary appraisal.

The individual's choice of prayer as a coping mechanism is related to both of the theories previously addressed. The individual's prior life experiences with religion and attempts to find meaning in life influence all other experiences as described by Rotter (1966). The individual's determination that prayer is a useful coping mechanism also relates to Lazarus' (1966) theory in both primary and secondary appraisal.

Problem

Is there a relationship between health locus of control and helpfulness of prayer as a coping mechanism in the preoperative cardiac surgery patient?

Hypothesis

1. There is a relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. The health locus of control scale generates three sub-hypotheses (Wallston et al., 1978):

A. There is a relationship between internal health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

B. There is a relationship between chance locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

C. There is a relationship between powerful others' health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

Definition of Terms

Terms for this study are defined as follows:

Health Locus of Control - A "measure of people's beliefs that their health is or is not determined by their behavior" (Wallston et al., 1978, p. 160). Health locus of control in this study consists of three subscale scores from the Multidimensional Health Locus of Control Scales (MHLC) (Wallston et al.).

Helpfulness of Prayer - Prayer is one of several direct action coping mechanisms identified by King (1984). For purposes of this study,

the helpfulness of prayer is a score on a 16-point visual analog scale of 0 to 15 ranging from not helpful to extremely helpful.

Preoperative Cardiac Surgery Patients - Adults preparing for coronary artery bypass grafting (CABG) surgery 1 day prior to the event.

Assumptions

1. Cardiac surgery is a stressful life event (Cohen & Lazarus, 1973; Dubin et al., 1979; Janis, 1958).
2. Cognitive appraisal of cardiac surgery results in surgery appraised as a threat or a challenge (Lazarus, 1966).
3. Coping mechanisms are selected following cognitive appraisal (Lazarus, 1966).
4. Selection of coping mechanisms is related to an individual's locus of control (Lazarus & Folkman, 1984; Rotter, 1966).
5. Prayer is a direct action coping mechanism (King, 1984; Ziemer, 1982).

Significance of the Study

Stress of cardiac surgery is well documented (Dubin et al., 1979; Janis, 1958). Whenever individuals are experiencing stress, if not interrupted, they can progress to death (Selye, 1976). As a result of these stressors, all resources must be tapped to stabilize the individual. Spiritual resources available to the person are rarely incorporated into nursing interventions. The theorists who created the framework chosen for this study incorporate the spiritual aspect as part of the makeup and experiences of the person that affect the way a situation is appraised and how much control the person believes he or she has (Lazarus, 1966; Rotter, 1966). Chrisman and Fowler (1980) advocate assessment of the individual's spiritual resources as well as incorporation of these resources into the plan of care. Generally, the spiritual

component is included in the psychological assessment of the person which does not specifically address an individual's decision to use prayer as one means of dealing with stress. The researcher's experience with patient care has identified prayer as a commonly used mechanism by patients to deal with stressful situations. No studies were found supporting the use of prayer by the surgical patient prior to cardiac surgery. Relating helpfulness of prayer to an individual's health locus of control is a way to identify types of individuals who do find prayer helpful as a way of dealing with the stress of cardiac surgery. This information can then be useful in establishing a plan of care that addresses the spiritual aspect of the individual. Carpenito (1983) identifies the spiritual dimension as one area requiring assessment and nursing diagnoses. Determination that prayer is a helpful mechanism for dealing with stress is one way to support the individual's spiritual dimension.

Summary

The work with stress appraisal and coping by Lazarus (1966) inter-relates personal control beliefs and the tendency for a person to find prayer helpful in coping with the stress of cardiac surgery. The stress of cardiac surgery has been found to be appraised as either a threat or a challenge (King, 1984). Judgment that an event is stressful is based on the person's perceptions as well as on the situation at hand (Lazarus & Folkman, 1984). Influencing this appraisal are personal beliefs about control as well as existential beliefs. Existential beliefs influence the use of prayer as a coping mechanism. This study examined the relationship between an individual's beliefs about control and helpfulness of prayer as a coping mechanism chosen to deal with cardiac surgery.

CHAPTER II

Review of Research

Following an extensive search of the literature, no studies were found examining health locus of control and prayer in the preoperative cardiac surgery patient. This review of research includes locus of control, health locus of control, stress appraisal, coping and coping resources, and the general support of prayer as a coping mechanism.

Locus of Control

Research reviews indicated that numerous studies have been completed addressing the locus of control construct (Arakaelian, 1980; Rotter, 1975; Strickland, 1978), although few have been related to the surgical patient. Lowery, Jacobsen, and Keane (1975) did examine the relationship of locus of control to preoperative anxiety for 91 patients undergoing general types of surgery. They found that the entire group experienced increased anxiety but those with an external orientation experienced much greater levels of anxiety than those with an internal orientation. Jennings and Sherman (1987), on the other hand, compared anxiety to locus of control in 91 ambulatory surgery patients and found no relationship. The fact that the patients did not require hospitalization could have accounted for the discrepancy.

Phares, Ritchie, and Davis (1968) suggested that the "possibility remains that internal and external orientations permit one to cope with threatening situations in different ways" (p. 402). Those with an internal orientation are more likely to take action and deal with a

problem directly (Anderson, 1977; Davis & Phares, 1967; Gore & Rotter, 1963). In relation to anxiety in healthy adults, Phares et al. (1968) hypothesized that the externally oriented individual will experience less anxiety than an individual of an internal orientation when confronted with threatening material contesting his self image since this person would blame forces beyond his control. No differences were found in anxiety levels. Both those with internal and external orientations experienced discomfort. The study also supported the hypothesis that those found to be internally oriented took action to change what could be changed.

Rotter (1966) proposed that the individual who believed success is up to him is much more likely to identify resources in his surroundings that would contribute to this success. As a result, he takes needed action to correct any environmental conditions and alter traits that hinder progress.

Health Locus of Control

Although studies have related general locus of control orientation to health situations, prediction of intentions to participate in health-related behaviors is limited since situational factors do have an impact on the person's locus orientation (Rotter, 1966, 1975). To measure situations specifically related to health, Wallston, Wallston, Kaplan, and Maides (1976) developed a scale to measure the probability that the person would participate in positive health behaviors. Wallston et al. (1978) refined the health locus of control scale based on suggestions recommended by Levenson (1973) to the present multidimensional health locus of control scales. Studies support that the multidimensional health locus of control scales can be used in predicting the willingness

of individuals to take part in health specific activities (Lau & Ware, 1981; Strickland, 1978; Rock, Myerowitz, Maisto, & Wallston, 1987).

Variations have been found to exist within health locus of control orientations. Krause (1986) found extremes in locus orientation in a population of older adults. Those with extreme external orientation avoided stress but could not effectively cope with stressors they could not avoid. Subjects with extreme internal orientation had fewer stress-producing situations because of their ability to participate in activities to prevent adverse situations, although these subjects were more affected by the stressful event than those of less extreme internal orientation. Marone and Desiderato (1982) related locus of control in psychiatric patients to choice of treatment. Preferences in treatment were found to be related to locus orientation. Those who were externally oriented preferred more structure than those with an internal orientation.

Boyle and Harrison (1981) found individuals to have both an internal and external orientation in relation to health. Revelation of this variation implies the possibility the individual could be influenced to one orientation over another. Since more positive behaviors are practiced by those with an internal orientation, a shift in this direction would seem to be beneficial. Influence toward internality would be most useful in situations with no alternatives in treatment since the best treatment for the individual can be determined by locus of orientation (Ferrington, 1986; Shillinger, 1983; Wallston, Smith, King, Forsberg, Wallston, & Nagy, 1983). Arakaelian (1980) proposes that a method of influencing the individual toward internality may be the best choice of treatment. Smith (1970) demonstrated that subjects in a psychiatric setting could be changed toward internality. A crisis group

of 30 subjects and a noncrisis group of 30 subjects each completed the Internal-External (I-E) scale following initial contact for treatment and again following 6 weeks of treatment. The group receiving crisis intervention showed a significant change toward internality while no such change occurred in those in the noncrisis group.

Pender (1985) found that relaxation training in hypertensive clients increased the internal health locus of control and decreased the chance health locus of control score when compared to a control group. It was concluded that the relaxation training allowed individuals to gain more control over their own health states. Hurley (1980) related effects of hypnosis, biofeedback, and transcendental meditation on locus of control and found no difference in scores. The 8-week training period may not have been enough time for individuals to show a change. Also, the subjects in this study were healthy adults and may not have noticed the physiologic effects as much as those subjects with hypertension.

Locus of Control and Coping

Work by Lazarus and Folkman (1984) revealed that individual control beliefs affect perception of stressful events and therefore influence choices of coping strategies. Folkman (1984) reported that for individuals to achieve more positive outcomes in stressful situations, it must be known if the person's belief in control is general or specific to the situation. This influences whether the individual appraises the event as threatening or challenging and will influence selection of coping strategies.

Parkes (1984) obtained data on coping and appraisal in healthy adults in a specific stressful situation and found those with an internal orientation to use more adaptive coping techniques than those with an external orientation. King (1984) used Lazarus' (1966) theory as the

framework for an exploratory correlational study on coping with cardiac surgery. Coping strategies were examined in 50 subjects, both pre-operatively and postoperatively. Cardiac surgery patients were found to appraise surgery more as a challenge than as a threat. An instrument based on the four categories of coping strategies found in the theoretical framework was developed for this study. Information seeking, direct action, turning to others, and intrapsychic modes of coping were the categories listed. Prayer was identified as one of several mechanisms under the category of direct action strategies used to cope with surgery. Direct action techniques were found to be more useful in the postoperative period. Zeimer (1982) also identified prayer as a direct action coping strategy. Several studies have found prayer as a commonly used coping technique in healthy adults (Bell, 1977), in an emergency room setting (Jalowiec & Powers, 1981), with psychiatric patients (Parker & St. Johns, 1959; Griffith, 1982), in patients with chronic low back pain (Turner & Clancy, 1986) and in a coronary care setting (Kowey, Friehling, & Marinchak, 1986). Berg (1980) demonstrated effectiveness of prayer in several case studies with patients having various medical problems.

In a study by Fordyce (1981), prayer was identified as the most frequently used religious practice. Stoll (1983) found prayer to be a significant strategy taken by subjects to cope with illness.

Sevensky (1981) addressed the relationship of religion and illness, expounding on the resources available through religion for the patient. Prayer was recognized as one of the most useful resources available for the patient. Various forms of prayer were identified, with meditation listed as one of the useful forms of prayer. Benson, Rosner, Marzetta, and Kleimchuk (1974) documented physiologic changes, especially a

decrease in blood pressure, as a benefit in hypertensive subjects using a form of meditation. Instructions in meditation were given to 22 subjects with borderline hypertension following 6 weeks of baseline measurements of blood pressure, with subjects serving as their own controls. Following 25 weeks of meditation, reductions of 10 millimeters of mercury were found in both systolic and diastolic blood pressure readings. Benson (1975) identified that these data, as well as historical writings, "establish the existence of an innate human capability: the relaxation response" (Benson, 1975, p. 9). Benson (1975) states that prayers and meditation have enabled people to achieve this response throughout history.

Summary

Review of research supported the premise that individuals with an internal locus of control orientation exhibited more positive behaviors than those of an external orientation. The literature indicates individuals can be influenced toward internality. Personal control beliefs were found to affect appraisal of stressful events and those with an internal orientation demonstrated more adaptive coping strategies. Prayer is one coping strategy identified as a resource for coping with stressful events, but its usefulness has not been specifically studied. King (1984) addressed general categories of coping in cardiac surgery patients. Appraisal of surgery as a challenge in the preoperative cardiac surgery patient was positively correlated with internal-causality and direct action coping. King (1984) cautioned that further research was needed before recommending to patients specific coping strategies as nursing interventions. This study addressed the relationship between helpfulness of prayer and personal control beliefs.

CHAPTER III

Methodology

The purpose of this study was to examine the relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

Design of the Study

A descriptive correlational design was utilized for this study. Variables under study were health locus of control and helpfulness of prayer in preoperative cardiac surgery patients.

Instrumentation

Two instruments were utilized in this study: the Multidimensional Health Locus of Control (MHLC) Scales (see Appendix A) and the Helpfulness of Prayer Scale (see Appendix B). Demographic information included age, sex, race, marital status, date of surgery, and religious preference (see Appendix C).

Multidimensional Health Locus of Control Scales

The MHLC is a tool developed by Wallston et al. (1978) after Levenson (1973) identified internal, chance, and powerful others as three basic components of locus of control with psychiatric patients. Three subscales representing each component comprise the MHLC scales. Each subscale contains six items scored on a 6-point Likert-type format with 1 indicating strongly disagree and 6 indicating strongly agree. Low scores indicate low internality (Wallston et al., 1978).

Wallston et al. (1978) tested the tool for reliability and validity. Alpha reliability coefficients were found to be .673 to .767, compared to .508 to .733 found by Levenson (1973). Wallston et al. (1978) have also created equal forms (A & B) to be used for repeated collections of data. Combining these forms increased the alpha reliability coefficient to .830 to .859. Form A was administered in this study. Construct validity was also addressed through significant correlations with Levenson's (1973) scale. No significant differences were found between men and women completing the scale. Wallston and Wallston (1982) hypothesized that individuals who have completed the MHLC scales fall into eight basic patterns, which they identify as follows: type I "pure" internal, type II "pure" powerful others external, type III "pure" chance external, type IV double external, type V believer in control, type VI dual beliefs, type VII "yes-sayer" and type VIII "nay-sayer". They conclude that further research is required to validate these findings. Rock et al. (1987) found six of the basic patterns proposed by Wallston and Wallston (1982) in a study with healthy adults and reported "a high degree of reliability" (Rock et al., 1987, p. 189). External validity and construct validity were confirmed with six patterns. They found these patterns easy to replicate with healthy adults. Research relating these patterns to individuals with medical problems is needed to further validate them. The initially proposed patterns by Wallston and Wallston (1982) may be evident in individuals who are dealing with hospitalization and are under the care of medical personnel.

Helpfulness of Prayer. Helpfulness of prayer was assessed using an instrument developed by the researcher. Prayer, defined as a communication with a higher being, was identified as one means of coping with the stress of surgery. Individuals indicated whether or not they used prayer

in dealing with their upcoming surgery. Those who used prayer rated the helpfulness of prayer on a visual analogue scale ranging from 0 to 15, with 0 indicating prayer was not helpful at all and 15 indicating that prayer was extremely helpful. A panel of three experts with graduate degrees in Theology was consulted to examine the content validity of this instrument. The experts indicated that the instrument measured what it was intended to measure. Test/retest reliability was established through administration of the instrument to five subjects who were within 6 months postoperative CABG surgery. A 1-week interval was given with 100% agreement obtained between the first and second administration. Demographic data were collected with additional items.

Subjects

Subjects were selected from a convenience sample of cardiac surgery patients scheduled for first-time coronary artery bypass grafting at a large southern university hospital. Nonprobability sampling was employed with a sample of 100 subjects. Both males and females, age 30 to 79 years, were included since Wallston et al. (1978) did not find significant differences in males and females with the MHLC scales. Each subject was studied 1 day prior to non-emergency surgery. Subjects were required to have an eighth grade reading level to complete the MHLC.

Procedure

Protection of human subjects was evaluated by the Institutional Review Board of the University of Alabama at Birmingham and approval to conduct the study was given. Permission to conduct the study was also obtained from the nursing department of the hospital. In addition, permission to use the MHLC scales was obtained from the authors (Appendix D).

Potential subjects were identified from the surgical schedule 1 day prior to surgery. The researcher approached possible subjects to determine their willingness to participate. The questionnaires were issued at this time and were collected by the researcher when completed.

A pilot study was completed prior to this study to assess the amount of time required to complete the instruments and determine if the procedures were satisfactory. No changes were required and the researcher proceeded as planned.

Analysis

Statistical hypothesis with subhypotheses generated are as follows:

1. There is no relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

A. There is no relationship between internal health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

B. There is no relationship between chance health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

C. There is no relationship between powerful others health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

Statistical hypotheses are represented as:

$$H_0: p = 0$$

$$H_a: p \neq 0$$

Spearman's Rho was used to test each hypothesis. The level of significance for each test was set at .05. Kruskal-Wallis One-Way

Analysis of Variance (ANOVA) was used to analyze typologies within the MHLC. The Mann-Whitney U test was used to determine differences in means of the eight typologies.

Limitations

Limitations of this study are identified as follows:

1. Subjects are limited to patients in a specific hospital in a southern region who may be more inclined to use prayer than throughout the general population. Therefore, it is not possible to generalize the findings to all cardiac surgery patients scheduled for CABG surgery.
2. Subjects may differ in the regular use of prayer, which may alter their perceptions of helpfulness of prayer.
3. Subjects who do not use prayer may not be willing to participate in the study.
4. The topic is a sensitive subject and may affect individual emotions which may affect the manner in which individuals complete the scales.
5. Findings are limited due to questionable reliability and validity of the Helpfulness of Prayer Scale.

CHAPTER IV

Findings

The purpose of this study was to determine whether there is a relationship between health locus of control and helpfulness of prayer as a direct action coping mechanism in preoperative cardiac surgery patients. The descriptive correlational design specified in the previous chapter was implemented with a convenience sample of preoperative patients 1 day prior to cardiac surgery. A total of 129 patients were asked to participate in this study. Twenty-eight patients, who were not told the nature of the study, refused without giving a reason or by verbalizing a feeling of exhaustion as a result of preparation for surgery. One subject failed to fully complete the MHLC scales and was eliminated from the study.

Description of the Subjects

The total sample comprised 100 subjects, including 72 males and 28 females. Ages of the subjects ranged from 38 to 79 years with a mean age of 61 years. The majority of subjects were married (84) and 16 were non-married, which included single, widowed, and divorced individuals. Ninety subjects were white and 10 were non-white; 87 subjects were Protestant, 8 were Catholic, 3 listed other religions, and 2 did not list a religion. The majority of subjects (96%) indicated they did use prayer as a coping mechanism to deal with the stress of cardiac surgery. Two subjects indicated they did not use prayer themselves but that others prayed for them, and two did not use prayer at all.

Presentation of the Findings

Descriptive statistics were tabulated for the three MHLC subscale scores and for the helpfulness of prayer scale. Table 1 presents descriptive statistics obtained for the three subscale scores of the MHLC scales. The data in Table 1 revealed that the sample perceived an internal control over their health (mean 24.74), followed closely by the belief that powerful others are in control of their health (mean 23.07). Perception that the control of health is due to luck, fate or chance received the lowest mean (15.87).

Table 1

Subscale Scores of the Multidimensional Health Locus of Control Scales

Subscale	Number	Mean	Range*	SD
IHLC	100	24.74	6-36	6.35
CHLC	100	15.87	6-36	6.47
PHLC	100	23.07	6-36	6.62

Note. IHLC - Internal Health Locus of Control; CHLC - Chance Health Locus of Control; PHLC = Powerful Others Health Locus of Control

*The Potential range on each subscale within the MHLC was 6-36

Descriptive statistics of the Helpfulness of Prayer Scale are presented in Table 2. The statistics revealed that 96% (n = 96) used prayer and 4% (n = 4) did not use prayer. Of the 96 subjects who did use prayer, 70 rated prayer as extremely helpful. Prayer was not rated by those not using prayer. One subject expressed the opinion that prayer could not be rated.

Table 2

Rating of Helpfulness of Prayer by Subjects
Using Prayer (n = 95)

Prayer Rating*	<u>n</u>	%
15	70	70
14	4	4
13	1	1
12	5	5
11	5	5
10	8	8
9	1	1
6	1	1
0	0	0

Note. 15 was the highest rating; 0 was the lowest rating

Spearman's Rho, with a two-tailed test, was used to test each of the three subhypotheses. The Software Package for the Social Sciences was used to tabulate computerized values for all correlations.

The first subhypothesis was there is no relationship between internal health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. The r value obtained was $-.0004$ ($p = .996$).

The second subhypothesis was there is no relationship between chance health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. The r value obtained was $-.0046$ ($p = .964$).

The third subhypothesis was there is no relationship between powerful others health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. The r value obtained was .1291 ($p = .210$). None of the correlations were significant at the .05 level; thus, each null hypothesis was accepted.

Typologies, as proposed by Wallston and Wallston (1982), were analyzed with the Kruskal-Wallis ANOVA. These typologies are based upon patterns of scores taken from the MHLC Scales. The prayer ratings for the eight typologies are presented in Table 3.

The Mann-Whitney U test was used to examine differences in paired samples. Type 6 was the only sample found to have a statistically significant difference in mean when compared to the other samples. Table 4 shows a statistically significant difference between Type 6 and Types 3, 4, 5, 7, 8, and prayer rating when corrected for ties. Four subjects fall into the Type 6 pattern, which is above the mean on the IHLC and CHLC scale and below the mean on the PHLC scale. The Type 6 group also rated prayer as less helpful.

Summary

Hypotheses related to health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients were tested in the current study. Analysis of data revealed no relationship between the three subscales of the Multidimensional Health Locus of Control Scales and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. Analysis of the typologies within the Multidimensional Health Locus of Control Scales did reveal a significant relationship between subjects who fall into the Type 6 pattern of the Multidimensional Health Locus of Control Scales and helpfulness of prayer as a coping mechanism.

Table 3

Kruskal-Wallis One Way Analysis of Variance for Prayer
Rating for Typologies^a Within the MHLC Scales

Prayer Rating by Type			
Typology	<u>n</u>	Mean Rank	
1	25	44.68	
2	7	49.43	
3	6	65.50	
4	14	57.39	
5	11	55.95	
6	4	19.38	
7	22	48.14	
8	11	58.05	
<u>Uncorrected for Ties</u>		<u>Corrected for Ties</u>	
Chi Square	Significance	Chi Square	Significance
9.2929	.2323	14.1636	.0483

^aEach type is categorized as follows: Type 1, "pure" Internal = High IHLC, Low PHLC, and CHLC; Type 2, "Pure" Powerful Others External = High PHLC, Low IHLC, and CHLC; Type 3, "Pure" Chance External = High CHLC, Low IHLC and PHLC; Type 4, Double External = High PHLC and CHLC, Low IHLC; Type 5, Believer in Control = High IHLC and PHLC, Low CHLC; Type 6, (not named since expected to occur rarely) = High IHLC and CHLC, Low PHLC; Type 7, "Yea-Sayer" = High IHLC, CHLC, and PHLC; Type 8, "Nay-Sayer" = Low IHLC, CHLC, and PHLC.

Table 4

Mann-Whitney U Test of Paired Samples with the
Type 6 Pattern Within the MHLC

Type	<u>n</u>	Corrected for Ties	
		<u>Z</u>	2-Tailed P
1 6	25 4	-1.4687	.1419
2 6	7 4	-1.5896	.1119
3 6	6 4	-2.8935	.0038*
4 6	14 4	-2.7849	.0054*
5 6	11 4	-2.4442	.0145*
7 6	22 4	-1.9765	.0481*
8 6	11 4	-2.8113	.0049*

*Significant difference in mean

CHAPTER V

Conclusions, Discussion, and Recommendations

The discussion includes an explanation of the findings. In addition, the findings are related to the methodology, conceptual framework, review of research, and assumptions.

Explanation of Findings

The purpose of this descriptive correlational study was to determine if there was a relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. No relationship was found between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. Lack of variability in subjects could account for failure to obtain a relationship since 70% of the subjects rated prayer as extremely helpful. The stability of locus of control orientation may be questionable during periods of extreme stress and could result in a change in the individual's normal orientation. This would also explain the lack of variability in the ratings of helpfulness of prayer.

This study revealed that prayer was perceived as helpful regardless of orientation of control. Individuals within each orientation of control, as well as those in each typology within the MHLC Scales, rated prayer as helpful. The time frame chosen for data collection, 1 day preoperatively as individuals were preparing for surgery, could

have increased the likelihood that individuals would rate prayer as helpful. Cardiac surgery provides a risk that the individual may not survive. Cowles (1988) discussed the influences that sensitive issues which evoke emotional responses may have on the collection of data. Objectivity and avoidance of situational influence are especially difficult in studies that address sensitive issues. Responding under such circumstances, to a questionnaire which addresses communication with a higher being when the outcome is unknown may cause individuals to feel they could not deny that prayer is helpful to them. Also, the introduction of the prayer instrument stated that some individuals did find prayer helpful, and this statement could have influenced subjects to agree they, too, found prayer helpful.

Research and Methodology

One hundred subjects were examined in this study. The size of the sample contributes to an increase in statistical significance, but a convenience sample was selected and thus the results are not generalizable to all coronary artery bypass graft patients.

No studies were found in which the multidimensional health locus of control scales has been administered to patients undergoing coronary artery bypass grafting. In summarized data from Wallston and Wallston (1982) with 609 chronically ill patients the results are as follows: IHLC, 25.78; CHLC, 17.64; and PHLC, 22.54. Results from the current study are similar to those accrued by Wallston and Wallston with patients having a chronic illness (see Appendix E).

Typologies of the MHLC Scales

In relation to the clusters within the MHLC Scales, the eight typologies discussed by Wallston and Wallston (1982) did occur in this

study although only five of the typologies had more than 10 subjects in each pattern. The five typologies with more than 10 subjects are as follows: Type 1 "Pure" internal with 25 subjects, Type 4 Double external with 14 subjects, Type 5 Believer in control with 11 subjects, Type 7 "Yea-sayer" with 22 subjects, and Type 8 "Nay-sayer" with 11 subjects. Rock et al. (1987) found that six typologies met the criterion of more than 10 subjects in each category with a sample of 200 healthy adults. In the current sample, subjects did occur in every typology, which supports the initial hypothesis proposed by Wallston and Wallston (1982) that individuals who completed the MHLC Scales would fall into eight basic patterns. It is worth noting that 4 of 100 subjects fell into the Type 6 typology of dual beliefs, which was believed to be the pattern least likely to occur (Wallston & Wallston, 1982). The only relationship found between the typologies and rating of helpfulness of prayer occurred in the Type 6 pattern, which is notable and warrants further study.

Findings and Conceptual Framework

The Chrisman and Fowler (1980) Systems-in-Change Model, Rotter's (1966) Social Learning Theory, and Lazarus' (1966) Cognitive Appraisal and Coping formed the framework for this study. The conceptual framework, combined with the theoretical framework, served well to encompass the individual locus of control orientation and determination of prayer as a coping mechanism within a patient care setting.

Chrisman and Fowler (1980) stress the importance of identifying individual components that enhance the person's ability to return to a state of equilibrium following a disruption such as that imposed by the need for cardiac surgery. This study revealed prayer to be perceived as an extremely helpful coping mechanism in dealing with the

stress of cardiac surgery. Chrisman and Fowler (1980) cite prayer as one of the individual resources within the personal system of the individual. Prayer can also be influenced by the religion component within the social system of the individual. Chrisman and Fowler's model successfully served as a guide for addressing prayer as a coping mechanism to deal with the stress of cardiac surgery.

Rotter's (1966) Social Learning Theory, further refined by Wallston and Wallston (1976) to address health specific behaviors, guided the relationship of prayer to locus of control. The current sample disclosed that, in individuals of each orientation, health-related behaviors are either internally controlled, under the control of powerful others or merely a matter of chance. Individuals of all types of orientation perceived prayer as helpful.

Thus, there is some question as to the support given to the Internal-External Construct of Rotter's (1966) Social Learning Theory by the current study. The tendency for an individual to find prayer as a helpful coping mechanism for dealing with the stress of cardiac surgery would seem to indicate belief in powerful others. Results of the present study showed that individuals of a chance and internal orientation were just as likely to find prayer helpful.

Work by Lazarus (1966) in relation to stress appraisal and coping guided the study pertaining to acceptable coping responses to alleviate stress. Lazarus identified existential beliefs as one resource that may be tapped as a means of coping following appraisal that a situation is stressful. The majority of subjects perceived prayer to be a helpful coping mechanism in dealing with the stress of cardiac surgery.

Since prayer is a tool influenced by existential beliefs, this study supports Lazarus' theory that existential beliefs do serve as an individual resource when coping with stress.

Findings Related to Review of Research

No studies were found in the review of research that related health locus of control to helpfulness of prayer as a coping mechanism. Findings of the current study are congruent with those of Hurley (1980) and Zaichowsky and Kanen (1978) in that meditation and relaxation training provided a physiological benefit to the subjects, but did not affect locus of control scores. In the current study, prayer was perceived to be a helpful coping mechanism to deal with the stress of cardiac surgery in individuals of both internal and external locus of control orientations.

In a study by Folkman et al. (1986), religious beliefs were found to have no relationship to appraisal of stress or coping in healthy adults. No studies were found addressing prayer as a coping mechanism in cardiac surgery patients.

One study which addressed spiritual coping strategies in cancer patients by Sodestrom and Martinson (1987), concurs with the current study in that the researchers found prayer to be the most frequently used coping strategy (84% of the subjects). Subjects in Sodestrom and Martinson's study expressed the need for nurses to support a patient's beliefs during a time of crisis, and that almost 50% of the subjects utilized nurses as resources to assist them in the identification of spiritual needs. These findings support completion of the current study and provide evidence that nurses need to include assessment and support of spiritual coping strategies into the nursing care plan.

Fordyce (1982) and Stoll (1985) found prayer to be the most meaningful and frequently used coping strategy to deal with illness in hospitalized adults. These findings are consistent with those of the current study in that 96 of 100 subjects perceived prayer to be extremely helpful in dealing with the stress of cardiac surgery.

A study by Moch (1988) analyzed nursing interventions that would provide patients with a balance between control and uncontrol in stressful situations. Use of prayer was suggested as a means to assist individuals in acceptance of situations beyond their control.

Two studies reported by Cotanch and Strum (1987) and Carey and Burish (1987) found significant benefits for cancer patients undergoing chemotherapy through the use of relaxation training. As indicated by Benson (1984), prayer and relaxation training provide similar physiologic and psychologic responses for the individual. Although the effects of prayer and relaxation training were not specifically addressed in the research literature with cardiac surgery patients, beneficial effects are documented in other populations.

Relation of Findings to the Assumptions

Cardiac surgery has been determined to be a stressful life event and requires activation of coping processes to deal with this stress (Dubin et al., 1979; Lazarus, 1966). Selection of prayer as a means to cope with this stress was not related to the individual's locus of control since individuals of each orientation rated prayer at the same degree of helpfulness. This finding is inconsistent with the assumption that selection of coping mechanisms is related to an individual's locus of control (Lazarus & Folkman, 1984; Rotter, 1966).

The findings of the study showed that 96% of all respondents did use prayer as a direct action coping mechanism. This finding is consistent with the assumption that prayer is a direct action coping mechanism (King, 1984; Ziemer, 1982).

Conclusions

It is concluded that there is no relationship between internal health locus of control and helpfulness of prayer as a coping mechanism, between chance health locus of control and helpfulness of prayer as a coping mechanism, or between powerful others health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients. The null hypotheses were retained. The findings thus support the conclusion that there is no relationship between health locus of control and helpfulness of prayer as a coping mechanism in preoperative cardiac surgery patients.

Most of the subjects (96 of 100) indicated they used prayer as a coping mechanism to deal with the stress of cardiac surgery. The majority of these subjects ($n = 70$) perceived prayer as being extremely helpful to them as they prepared for cardiac surgery. These data indicate that all types of individuals, regardless of their belief in control, did find prayer to be helpful.

Through analysis of clusters within the MHLC Scales, it was discovered that all individuals in the Type 6 pattern (High Internal, High Chance, and Low Powerful Others) rated prayer lower on the rating scale or did not use prayer as a coping mechanism. Wallston and Wallston (1982) indicated that this type would rarely occur due to the dualism of beliefs that they are both in control of their health and that their health is due to luck, fate, or chance. Even though only four subjects

fell into this category, it is notable when compared to the study by Rock et al. (1987) with 200 subjects in which no subjects were found in this category.

Recommendations

Recommendations for further research suggested by this study include:

1. Replication of this study with a larger and more heterogeneous sample in order to increase the generalizability of these findings.
2. Study of the relationship between use of prayer and coping to determine if prayer enhances the individual's ability to cope with stressful situations.
3. Replication of this study in a postoperative setting where the individual is not facing an unknown and threatening situation to determine if the findings are the same.
4. Replication of this study with subjects earlier in the preparation for the surgical event to determine if timing of data collection influences the results.
5. Replication of this study with subjects preparing for other types of surgery to determine if the nature of the surgery influences the results.

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APPENDIX A

Multidimensional Health Locus of Control Scales

Code #
Date :

MHLC Form A

This is a questionnaire designed to determine the way in which different people view certain important health-related issues. Each item is a belief statement with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

Please answer these items carefully, but do not spend too much time on any one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3. Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6. I am in control of my health.	1	2	3	4	5	6
7. My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8. When I get sick, I am to blame.	1	2	3	4	5	6
9. Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10. Health professionals control my health.	1	2	3	4	5	6
11. My good health is largely a matter of good fortune.	1	2	3	4	5	6
12. The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13. If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15. No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
16. If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17. If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18. Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

Form A

Internal Health Locus of Control (IHLC)

1. If I get sick, it is my own behavior which determines how soon I get well again.
6. I am in control of my health.
8. When I get sick I am to blame.
12. The main thing which affects my health is what I myself do.
13. If I take care of myself, I can avoid illness.
17. If I take the right actions, I can stay healthy.

Powerful Others Health Locus of Control (PHLC)

3. Having regular contact with my physician is the best way for me to avoid illness.
5. Whenever I don't feel well, I should consult a medically trained professional.
7. My family has a lot to do with my becoming sick or staying healthy.
10. Health professionals control my health.
14. When I recover from an illness, it is usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.
18. Regarding my health, I can only do what my doctor tells me to do.

Change Health Locus of Control (CHLC)

2. No matter what I do if I am going to get sick, I will get sick.
4. Most things that affect my health happen to me by accident.
9. Luck plays a big part in determining how soon I will recover from an illness.
11. My good health is largely a matter of good fortune.
15. No matter what I do, I'm likely to get sick.
16. If it's meant to be, I will stay healthy.

APPENDIX B

Helpfulness of Prayer Scale

Helpfulness of Prayer Scale

Code # _____
Date: _____

Instructions:

Several methods have helped people relax while getting ready for cardiac surgery. Prayer as communication with a Higher Being is one method found to help people cope with the stress of surgery. Please indicate whether this method is helpful to you. Rate how helpful on the scale provided.

1. Have you used prayer to help you prepare for cardiac surgery?

Yes

No

If yes, how helpful is it?

[illegible]

APPENDIX C
Demographic Data

Demographic Data

Code # _____

Date: _____

1. Sex: Male/Female
2. Age:
3. Marital status: Married/Non-married
4. Race: White/Non-white
5. Date of surgery:
6. Religious preference:

APPENDIX D

Permission to Use Tool

VANDERBILT UNIVERSITY

NASHVILLE, TENNESSEE 37240

TELEPHONE (615) 322-7311

Health Care Research Project • School of Nursing • Direct phone 322-2520

Dear Colleague:

Thank you for your interest in our Health Locus of Control Scales. Please excuse this form response, but we have so many inquiries requiring similar replies that we have found this to be an efficient means of disseminating information.

You have our permission to utilize the scales in any health related research you are doing. Our only request is that you keep us informed of any results you obtain using the scales. In that way we hope to continue to serve as a clearinghouse for information about the scales.

We recommend using the more recently developed Multidimensional Health Locus of Control Scales (Health Education Monographs, 6, Spring, 1978, pp. 160-170) over the earlier, unidimensional HLC Scale (Journal of Consulting and Clinical Psychology, 1976, 44, 580-585), since the newer measures are psychometrically superior and potentially more useful.

If you wish to be added to our mailing list or want us to send you additional material, please complete the enclosed interest questionnaire. We hope to periodically send additional material related to use of these scales as it becomes available.

If you have more specific questions, don't hesitate to contact us. Please remember to send us information on any use you make of our scales. We have included a usage questionnaire to facilitate your doing so. We look forward to hearing from you.

Sincerely,



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APPENDIX E

Scoring Instructions MHLC Scales

Scoring Instructions MHLC Scales

Form A or B

The score on each subscale is the sum of the values circled for each item in that subscale.

<u>Internal Items:</u>	1, 6, 8, 12, 13, 17
<u>Chance Items:</u>	2, 4, 9, 11, 15, 16
<u>Powerful Others Items:</u>	3, 5, 7, 10, 14, 18

MEAN SCORES FOR MHLC SCALES SUMMARIZED ACROSS TYPES OF SUBJECTS

<u>SAMPLE</u>	<u>N</u>	<u>IHLC</u>	<u>CHLC</u>	<u>PHLC</u>
CHRONIC PATIENTS	609	25.78	17.64	22.54
COLLEGE STUDENTS	749	26.68	16.72	17.87
HEALTHY ADULTS	1287	25.55	16.21	19.16
PERSONS ENGAGED IN PREVENTIVE HEALTH BEHAVIORS	720	27.38	15.52	18.44