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RELATIONSHIPS AMONG FAMILY STRESS, FAMILY ADAPTATION, AND PSYCHOLOGICAL WELL-BEING OF ELDERLY CORONARY ARTERY BYPASS GRAFT PATIENTS

by

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DISSERTATION

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ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM

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Title Relationships Among Family Stress, Family Adaptation, and Psychological Well-Being of Elderly Coronary Artery Bypass Graft Patients

Recovery from coronary artery bypass graft surgery (CABGS) for an increasingly older patient population is a time of stress for patients and families. One aspect of recovery of concern for both patients and families following CABGS is the psychological well-being of the patient. The psychological well-being of CABGS patients during early recovery may be adversely affected if the accumulation of family stressors exceeds the ability of the family to adapt to these stressors.

The purpose of this descriptive correlational study was to describe the relationship among pile-up of demands, family adaptation, and patient psychological well-being 3 weeks after discharge from the hospital following CABGS. The conceptual framework for the study was a modification of McCubbin's Double ABCX Family Stress theory. Based on the conceptual framework, patient psychological well-being was hypothesized to be negatively related to pile-up of family demands and positively related to family adaptation. Further, family adaptation was hypothesized as a mediator of the relationship between family demands and patient psychological well-being.

Study variables were family stressors (Family Inventory of Life Events), family adaptation (FACES II), and patient psychological well-being (Mental Health Index-5). A convenience sample (N = 42) of CABGS patients 65 years of age or older was recruited

from two tertiary-care facilities in a large metropolitan area in the southeast. Participants completed the study instruments via a telephone interview 3 weeks after discharge. Data were analyzed using descriptive statistics, Pearson correlation, and regression analyses.

Data analyses revealed that study participants had a moderate level of family stress and perceived their family adaptation as "balanced." Participants had poorer psychological well-being when compared to a normative population. Hypothesis testing indicated a significant positive relationship between family adaptation and patient psychological well-being ($r = .32$; $p = .04$). No significant relationship was found between pile-up of demands and family adaptation or psychological well-being. Family adaptation was found not to mediate the relationship between pile-up of demands and psychological well-being. Findings of this study indicate that the conceptual framework, based on the Double ABCX Model, has potential implications for understanding the relationship between family stress, family adaptation, and the psychological well-being of elderly CABGS patients.

DEDICATION

Dedicated to the memory of Bob Kinney

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LIST OF ABBREVIATIONS

BDI	Beck Depression Inventory
CABGS	Coronary Artery Bypass Graft Surgery
CRS	Clinical Risk Score
FACES II	Family Adaptability and Cohesion Evaluation Scale II
FES	Family Environment Scale
FILE	Family Inventory of Life Events
ICU	Intensive Care Unit
LOS	Length of Stay
MHI -5	Mental Health Index 5
MI	Myocardial Infarction
PAIS	Psychosocial Adjustment to Illness Scale
PLOS	Postoperative Length of Stay
POMS	Profile of Mood States

CHAPTER 1

INTRODUCTION

Serious illness and hospitalization of a family member are stressful situations for the entire family; however, the impact of illness on the family extends beyond hospitalization. Family responses to stressors associated with illness and hospitalization also are influenced by family strains that occur before and after hospitalization. As stressors accumulate, family resources and coping skills may become inadequate to meet family demands. How families adapt to situations affects not only their well-being but also the recovery of the patient.

Contributing to the potential impact of illness on patients and families is the move towards earlier discharge for many patient populations. The average length of stay (LOS) for all hospitalized patients in 1980 was 7.3 days, compared to 4.9 days in 2000 (U.S. Dept. of Health & Human Services, 2002). Patients undergoing coronary artery bypass graft surgery (CABGS) reflect a patient population greatly affected by early discharge trends. Previously, postoperative length of stay (PLOS) was generally greater than seven days; today, as many as 50% of patients are discharged by the fourth postoperative day (Deaton et al., 1998; Dunstan & Riddle, 1997; Engelman et al., 1994). While the tremendous economic cost associated with cardiac surgery has been a primary impetus for decreasing length of stay, improvements in preoperative, intraoperative, and postoperative management of CABGS patients also have made a shorter length of stay

feasible (Chen, 1998; Clark, Kotyra, & Brocious, 1999; Dunstan & Riddle, 1997; Engelman et al., 1994).

Early discharge is generally accepted as safe practice for CABGS patients who are younger, have fewer comorbid diseases, and have better myocardial function (Cowper et al., 1997; Dunstan & Riddle, 1997). Demographics and preoperative characteristics of CABGS patients are changing, however, due to advances in the medical management of coronary artery disease. The number of CABGS patients over the age of 65 has increased significantly over the past 15 years (Akins et al., 1994). The number of patients over the age of 80, previously not considered surgical candidates, also continues to grow (Warner et al., 1997). Moreover, as the aging population increases, the number of older CABGS patients is likely to continue to increase.

With an increasingly older patient population, changes in other preoperative characteristics of patients undergoing CABGS are evident. Patients have more extensive arterial disease, poorer left ventricular function, and an increased number of other chronic illnesses, such as diabetes and hypertension (Jones, Weintraub, Craver, Guyton, & Cohen, 1991; Warner et al., 1997). Postoperatively, an increased incidence of complications (Warner et al.) is associated with older CABGS patients. Comorbid diseases such as peripheral vascular disease, diabetes mellitus, cerebrovascular disease, renal dysfunction, hypertension, and severe left ventricular dysfunction are associated with increased morbidity and mortality following CABGS (Barsness et al., 1997; Higgins et al., 1992; Warner et al.).

Despite these changes in patient characteristics, the average hospital length of stay of cardiac surgery patients has declined. While cardiac patients who are sicker tend to have longer hospital stays than "uncomplicated" patients, they are still discharged sooner

than in the past. Advanced age with the presence of other chronic illnesses can complicate recovery from CABGS and, therefore, create additional stressors for patients and their families during early recovery.

One aspect of patient health during early recovery that is a concern for patients and families following CABGS is the psychological well-being of the patient. Particularly during the first 3 weeks after discharge, mood fluctuations and emotional reactions such as anxiety, fear, sadness, and depression are sources of stress for patients (Goodman, 1997; Jaarsma, Kastermans, Dassen, & Philipsen, 1995; King & Parrinello, 1988). Additionally, family members caring for CABGS patients after discharge cite psychological well-being as a major source of concern (Artinian & Duggan, 1993).

The psychological well-being of patients recovering from a severe illness is influenced by many factors, including family support (Mayou, Foster, & Williamson, 1978; White & Frasure-Smith, 1995; Wilson-Barnett, 1981). The psychological well-being of CABGS patients during early recovery may be adversely affected if the accumulation of family demands, known as pile-up, exceeds the ability of the family to adapt to accumulating family demands. While empirical data on the effects of early discharge on patient outcomes such as morbidity and mortality are accumulating, understanding of factors that affect psychological well-being is limited.

Statement of the Problem

The problem addressed by this study was the lack of knowledge related to pile-up of family demands encountered by elderly patients and their families, family adaptation, and the effect of family adaptation on patient psychological well-being during the first three weeks after hospital discharge following CABGS. The psychological state of pa-

tients is one of many variables affecting recovery following CABGS. Studies cite incidences of emotional reactions such as anxiety, nervousness, and depression that range from 10% to 60% following CABGS (Artinian, Duggan, & Miller, 1993; Burker et al., 1995; Cronin, Logsdon, & Miracle, 1997; Jaarsma et al., 1995; Ruiz, Dibble, Gillis & Gortner, 1992). In addition, the patient's personality, along with feelings of nervousness, anxiety, and depression, may negatively impact recovery (Sauve´ & Fortin, 1996; Wilson-Barnett, 1981). Further, psychological distress during recovery may be a significant source of concern for patients and families during the first 3 weeks following CABGS (Goodman, 1997; Jaarsma et al., 1995; King & Parrinello, 1988; Ruiz et al., 1992).

Empirical literature emphasizes the importance of family support in positively influencing the psychological well-being of CABGS patients during recovery. Patients with high family support experience less uncertainty and fewer symptoms of psychological distress than patients with lower social support (Creasia, 1992; White & Frasure – Smith, 1995). However, CABGS is a major event associated with multiple family demands that occur prior to surgery, during hospitalization, and following discharge. How families adapt to these multiple demands may influence how well they are able to support the patient.

Previous research has focused on family stressors during hospitalization and recovery. Frequently unrecognized by health care providers has been the role of stressors and hardships that families may be managing prior to surgery. Prior family strains unrelated to the illness, normative transitions, and illness characteristics contribute to the pile-up of family demands. Physical, psychological, and social changes that occur as a result of aging and the family's life cycle may create stressors for older patients and their fami-

lies that are not evident in younger patients and their families. Age may be a significant factor in determining if a situation is perceived as a hardship and strain. While younger patients and their families may perceive certain situations as hardships, older patients and their families may perceive these as nontroublesome. In addition, coping resources may be different, allowing for better adaptation to the stress of surgery and recovery. A better understanding is needed of how life stages influence family hardships and strains, family adaptation, and the psychological well-being of the patient.

Illness characteristics also affect the stressors encountered and the resources used in adapting to situations. Illness characteristics such as the onset and progression of the illness, expected outcomes, degree of incapacitation and uncertainty, and whether another crisis situation will occur may produce strain for families (Rolland, 1994). Patients undergoing CABGS also are adapting to a progressive disease, that of coronary atherosclerotic disease. As an increasing number of CABGS patients manage other comorbidities, the course of their illness creates additional demands and hardships that may impact family adjustment. During recovery from CABGS, patients and families will also have to deal with the uncertainty of whether their coronary artery disease stabilizes or progressively worsens, potential relapses, and unknown outcomes.

Many studies describing patient and family stressors were conducted in the 1980s when patient characteristics and standards of care for CABGS patients were very different from current practices. Knowledge is limited about the impact of current practices on CABGS patients and their families during early recovery. Additionally, earlier studies focused on stressors associated with hospitalization and long-term recovery. Increased understanding of the relationship between previous and concurrent family stressors, family adaptation, and patient psychological well-being in early recovery can assist health

care providers in identifying patients and families at risk and assist in the development of nursing interventions to support them.

Purpose of the Study

The purpose of the study was to describe the relationships among pile-up of demands, family adaptation, and patient psychological well-being 3 weeks after discharge following CABGS in elderly patients.

Theoretical Framework

The conceptual framework for this study was based on the Double ABCX model of family stress (Figure 1). The Double ABCX model addresses both precrisis and post-crisis family variables hypothesized to influence family adaptation to a potential crisis situation. The premise of the Double ABCX model is that a family's response to stressor events is influenced not only by actual events, but also by the accumulation of hardships and demands experienced by that family. Family adaptation describes the responses of families to the accumulation of demands, called "pile-up." According to the Double ABCX model, family adaptation to a potential crisis event is dependent upon the pile-up of demands, available family resources to meet demands, and perceptions by families of the situation (McCubbin & Figley, 1983).

For this study, the Double ABCX model was modified to include patient psychological well-being as an outcome variable. In the modified conceptual model, the pile-up of family demands and strains was hypothesized to negatively impact both family adaptation and the psychological well-being of CABGS patients during early recovery at home. This modification was based on the assumption that stressors affecting the family unit

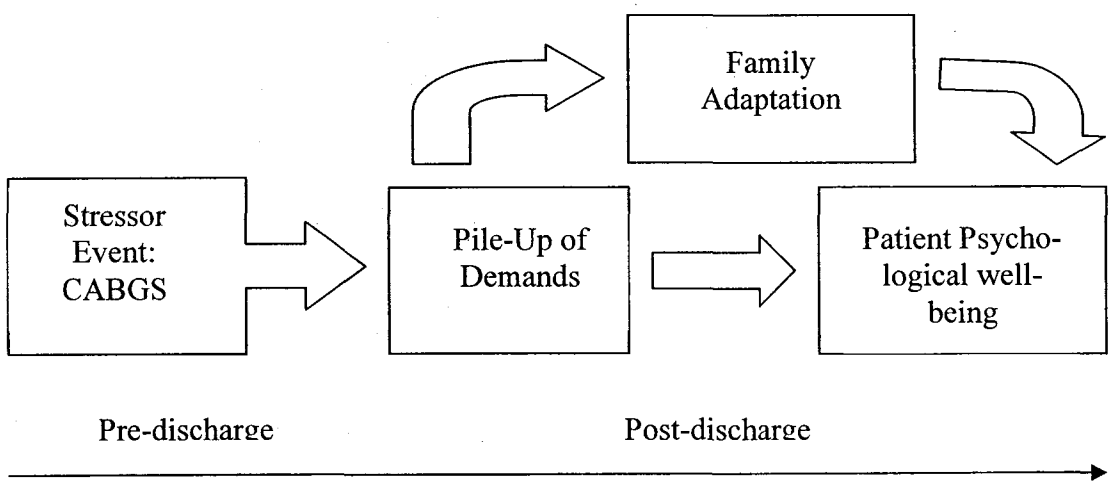

Figure 1. Conceptual model of family stress and patient psychological well-being.

also impact individual family members (McCubbin, Thompson, & McCubbin, 1996). The model also proposed that family adaptation would mediate the relationship between the pile-up of demands and psychological well-being.

Family Stressor Event

A family stressor was defined as "a life event or transition impacting upon the family unit which produces, or has the potential for producing, change in the family social system" (McCubbin & Patterson, 1983, p. 8). Family stressors are characterized as normative or nonnormative transitions, acute or chronic, cumulative or isolated, volitional or nonvolitional (Boss, 1988). CABGS is a nonnormative source of stress for families. While the surgery itself is an isolated, acute event, the presence of coronary artery disease, a chronic condition leading to the acute event of CABGS, is a cumulative stressor. The complexity of the characteristics of the stressor of CABGS creates additional challenges for families. Changes in family systems that may occur as a result of stressors include changes in family relationships, functioning, goals, and the overall well-being of the family (McCubbin et al., 1996).

Pile-Up of Demands

A proposition implicit in the Double ABCX model is that, in the face of a family stressor event, the pile-up of family stressors and demands is negatively related to family adaptation. Families seldom deal with a single stressor (McCubbin & Figley, 1983). For elderly CABGS patients, illness-related demands, prior strains, and concurrent stressors contribute to a pile-up of demands that may impact family adaptation and patient health.

Stressors associated with waiting for surgery, hospitalization, and early recovery following discharge create illness-related demands. Illness-related demands contributing to the pile-up may include unresolved aspects and unmanaged hardships associated with the stressor event, intrafamily changes precipitated by the stressor, and residual hardships and demands precipitated by family efforts at coping. Financial hardships, changes in work or recreation, or demand for home care are examples of family demands that may be present due to the stressor event. The severity of the stress is determined by the degree to which the stressor poses a threat to family functioning or depletes family resources to cope with the demands created by the stressor (McCubbin et al., 1996).

In addition to illness-related stressors, prior strains and other concurrent stressors also affect family adaptation. Prior strains and concurrent stressors may result from normative transitions that the family system normally experiences over time. These transitions are related to normal life cycle changes of the family unit and individual family members. Life cycle changes can occur concomitantly, but independently, of the stressor event. Normative transitions affect change in the family unit, placing demands on the family, and thus require adaptation on the part of the family. If normative transitions occur concomitantly with another family stressor such as illness, the increased demands on family function may make family adaptation more difficult (McCubbin et al., 1996).

Contributions of normative transitions to the pile-up of demands are unique, depending upon the developmental stage of the family. Family hardships or demands created by a normative transition will vary depending on the family, suggesting that the pile-up of demands for families of elderly CABGS patients is different from that of younger patients and their families.

Residual effects of prior family stressors may also contribute to the pile-up of demands. Residual strains may result from unresolved family hardships from earlier stressors, transitions, or crises. In addition, coping behaviors used to manage the stressor event and related demands may have consequences that can contribute to a pile-up of demands on families. Families of elderly CABGS patients may be managing prior family stressors such as those created by normative and nonnormative transitions, including the presence of other chronic illnesses. If families are confronted with a new stressor, then prior strains may be exacerbated, further increasing demands on the family. Family resources that have previously been adequate can be strained in the presence of the new stressors, potentially resulting in disruption in usual family functioning. Stressors and strains can arise from specific behaviors that families may use to manage a potential crisis event. Family members may take a leave of absence during a potential crisis event such as CABGS to cope with hardships created during the time of hospitalization, but this coping behavior may create additional hardships such as financial strains.

Inherent to every stressor is ambiguity due to the uncertainty created by stressor events. Intrafamily ambiguity may be related to family structure. Boundary ambiguity, or uncertainty about who is inside the family system, is a major stressor for the family system (McCubbin & Figley, 1983). This ambiguity may have implications for elderly CABGS patients who prior to surgery are independent and possibly living on their own, but after surgery may require help from family outside the immediate household.

Social ambiguity refers to the conflict between what families expect from society in helping them manage a stressor event and what is actually available. The ability of the family to manage stress may be dependent upon the availability of community resources (McCubbin, Sussman, & Patterson, 1983). Older CABGS patients, who tend to be

sicker, may require more care during early recovery at home. Patients and families may look to community resources to help manage these demands. Community resources may or may not be available for this population, who may need more community resources than a younger, relatively healthier population.

Families do not manage a stressor event such as CABGS in isolation. In addition to demands on families related to the illness event, families must continue to cope with prior stressors and concurrent stressors unrelated to the CABGS. Family adaptation to this potential crisis event will be affected by the accumulation, or pile-up, of demands.

Family Adaptation

In the conceptual model, family adaptation describes the outcome of family efforts to achieve balance in family functioning. Additionally, family adaptation is hypothesized to mediate the relationship between the pile-up of family demands and the psychological well-being of CABGS patients. Family responses to a major stressful event evolve and resolve over a period of time (McCubbin & Patterson, 1982). The process of family adaptation refers to the "efforts by a family to realign its members as an integrated and functioning unit" (Bowen, Orthner, & Bell, 1997, p. 54). As a mediating variable, family adaptation is hypothesized to be a consequence of the predictor variable, the pile-up of demands, and an antecedent for the outcome variable, patient psychological well-being (Bennett, 2000).

Adaptation is depicted as a continuum from bonadaptation to maladaptation. Bonadaptation is characterized by maintenance or strengthening of family integrity, individual and family unit development, and the maintenance of family independence. At the other end of the continuum is maladaptation, which is characterized by deterioration

in family integrity, a curtailment of individual and /or family unit development, and a loss or decline in family independence (McCubbin & Patterson, 1983). The expected outcome to family adaptation is the reduction or elimination of the disruptiveness, disorganization, or incapacitatedness of the family.

Patient Psychological Well-Being

The efforts of a family to adapt to a stressor event simultaneously involve individual family members and the family unit (McCubbin & Figley, 1983). Psychological well-being during the first three weeks following discharge is a concern for both CABGS patients and their families (Allen, 1990; Artinian & Duggan, 1993; Moore, 1995). Additionally, the psychological well-being of patients has been found to affect the physical well-being of CABGS patients during recovery (Connerney, Shapiro, McLaughlin, Bagiella, & Sloan, 2001; Ruiz et al., 1992; Zyzanski, Stanton, Jenkins, & Klein, 1981).

Previous research also supports a relationship between family support and patient psychological well-being. The conceptual model proposed that the pile-up of family demands, mediated by family adaptation, was a predictor of CABGS patients' psychological well-being.

When confronted with a stressful event such as CABGS, the goal is to promote patient recovery. The conceptual framework for this study proposed that family adaptation is not only an outcome resulting from the ability of a family to cope with the pile-up of demands, but is also a mediator between the accumulation of demands and the psychological well-being of the CABGS patient during early recovery. The pile-up of demands is affected by hardships created by the stressor event (illness-related demands), along

with prior and concurrent stressors unrelated to the illness. The cumulative impact of these stressors and demands has the potential to negatively affect family adaptation, which in turn negatively affects patient psychological well-being during the first 3 weeks after discharge following CABGS.

Research Questions and Hypotheses

1. What is the relationship between the pile-up of demands and family adaptation in families of elderly patients 3 weeks postdischarge following CABGS?
    a. Pile-up of demands experienced by families of elderly CABGS patients 3 weeks postdischarge is negatively related to family adaptation.
2. What is the relationship between family adaptation and the psychological well-being of elderly CABGS patients 3 weeks postdischarge?
    a. Family adaptation is positively related to the psychological well-being of elderly CABGS patients 3 weeks postdischarge.
3. What is the relationship between the pile-up of demands and the psychological well-being of elderly CABGS patients 3 weeks postdischarge?
    a. Pile-up of demands is negatively related to the psychological well-being of elderly CABGS patients 3 weeks postdischarge.
4. Is family adaptation a mediating variable between the pile-up of demands and the psychological well-being of elderly CABGS patients 3 weeks postdischarge?
    a. Family adaptation is a mediating variable in the relationship between the pile-up of demands and the psychological well-being of elderly CABGS patients 3 weeks postdischarge.

Significance of the Study

Cardiovascular disease is a major health concern in the United States. In 2001, cardiovascular disease had the highest number of discharges from short-stay hospitals than any other disease category. The cost of coronary heart disease alone is almost $96 billion annually. In 2001, nearly 516,000 cardiac revascularization procedures were performed as an intervention for coronary heart disease. Additionally, 84% of persons who die of cardiovascular disease are 65 years of age and older (American Heart Association, [AHA], 2003).

Changes in health care leading to shorter hospital stays for acutely ill patients also have affected cardiac care management. In an attempt to decrease cardiac care costs, programs have been developed to "reduce inpatient costs, shift care to the outpatient setting, and closely monitor the appropriateness of procedures" (Gates, 1996, p.10). Patients are now discharged an average of 4 to 6 days post cardiac revascularization. Previously, hospital stays lasted 10 days or longer (Huerta-Torres, 1998; Johnson & McMahan, 1997; Wu, 1995). Patients who previously would be ineligible for surgery due to age, severity of disease, or the presence of other chronic illnesses are now undergoing surgical revascularization in increasing numbers. While the average LOS for older patients may be longer than that of a younger patient, the LOS is still shorter than in the past.

Knowledge gained from this study has implications for nursing practice, research, education, and health policy. An essential feature of nursing practice includes "attention to the full range of human experiences and responses to health and illness" (American Nurses Association [ANA], p. 6, 1995). Information is limited regarding the influence of prior family strains and hardships on family adaptation and the psychological well-being

of patients following CABGS, particularly during early recovery following discharge. As an increasing number of CABGS patients are older and have other comorbidities, many families have already strained existing resources, hindering family adaptation during recovery. Increased knowledge of the influence of prior family demands can facilitate the identification of patients and families at risk for development of negative outcomes. Health care practitioners can use this knowledge to enhance preoperative assessments of patients and families and, in turn, enhance patient and family preparation for discharge.

With increasingly shorter lengths of stay for patients following CABGS, nurses are required to provide discharge instructions to patients and family members on complex issues such as medications, wound care, and signs and symptoms of potential complications during a time when patients and family members may be too stressed by the recent events of the illness and hospitalization to fully understand instructions. While patients and families may anticipate the physical aspects of care after discharge, the psychological response of patients is often unexpected.

The occurrence of CABGS is a serious event affecting the entire family. While many patients and families are able to cope with increased family demands created by CABGS, other families and patients have a more difficult time. For elderly patients who may already have preexisting chronic illnesses require CABGS, the surgery has the potential to strain coping capabilities of families beyond normative transitions. Practitioners need to recognize that CABGS patients and their families must cope with a variety of strains, not just those associated with the surgery. Increased understanding of the types of demands that create the most hardship for CABGS patients and families will assist nurses in better meeting the needs of patients and families. Increased understanding of the relationship between the pile-up of demands and the psychological well-being

of CABGS patients will provide practitioners an opportunity to adapt discharge teaching to better meet the needs of patients and families at risk.

Information gleaned from this study will enhance the ability of nurse researchers to develop and test nursing interventions to strengthen family adaptation after discharge. Facilitating family adaptation can potentially decrease negative outcomes for CABGS patients during early recovery. Better understanding of the types of stressors that negatively affect family adaptation, along with knowledge of the role of life cycle transitions, can help nurse researchers develop interventions that are tailored to individual family needs.

Nurse educators can use the same information to better prepare students to "assist patients, families, and communities to improve, correct, or adjust to physical, emotional, psychosocial, spiritual, cultural, and environmental conditions for which they seek to help" (ANA, 1995, p.9). The American Association of Colleges of Nursing (2000) has recommended curricular competencies and guidelines for geriatric nursing care. Increased understanding of the relationship between family stressors, family adaptation, and psychological well-being in elderly CABGS patients may assist educators in addressing competencies and guidelines related to individualizing care for older adults.

Many social factors affect patients and families managing illness. Changes in social policy, development of support systems, family relationships, single-person households, changes in family structure, employment of women, and demographic changes play a role in how a family adapts to a family member with a serious illness (Bomar & Cooper, 1996). Policy issues such as family leave, long-term care, and access to health care are important issues for families who experience serious illness. Information gained from this study will facilitate the role of nurses as a family advocate

in the area of social policy. As family advocates, nurses "must make a commitment to becoming knowledgeable about the needs and wants of the families that they encounter every day in their work" (Goodyear, 1996, p. 401).

As cardiovascular disease continues to be a major health problem in the United States, changes in medical management of cardiac patients challenge nurses to develop research-based interventions to promote positive outcomes for patients and their families. An increased understanding of the relationship between family stress and adaptation and how these factors influence patient recovery will provide nurse practitioners, researchers, and educators with needed information to begin to meet the needs of CABGS patients and their families.

Definition of Terms

For the purpose of this study, the following terms were defined:

Family Stressor was defined as a "life event or transition impacting upon the family unit which produces, or has the potential of producing, change in the family social system" (McCubbin, Sussman et al., 1983, p. 8). For purposes of this study, the stressor event was an elective, urgent, or emergent isolated CABGS, as identified by the medical record.

Elderly CABGS Patients were individuals 65 years of age or older who were recovering following their first coronary artery bypass graft surgery. For purposes of this study, elderly CABGS patients were patients who were 65 years of age or older and admitted to the ICU following elective, urgent, or emergent isolated CABGS.

Family is a group of individuals who may or may not be related whose caregiving functions include that of protection, nourishment, and socialization. The group is bound

together through attachment and a commitment that includes a future obligation to one another (Stuart, 1991). For purposes of this study, family comprised those individuals who were attached, committed, and related to the CABGS patient through the caregiving functions of protection, nourishment, and socialization, as identified by CABGS patients.

The pile-up of demands refers to the accumulation of demands on or within the family unit as a result of normative and nonnormative stressors and intrafamily strains (McCubbin & Patterson, 1982). For purposes of this study, the pile-up of demands was defined as normative and nonnormative stressors and intrafamily strains as identified by the Family Inventory of Life Events (FILE) instrument.

Family adaptation refers to the process of "efforts by the family to realign its members as an integrated and functioning unit" (Bowen et al., 1997, p. 54). For this study, family adaptation was defined by the three components of family adaptation as identified by the Family Adaptability and Cohesion Evaluation Scale II (FACES II): family adaptability, family cohesion, and family communication. Family adaptability is defined as "the ability of a marital or family system to change its power structure, role relationships, and relationship rules in response to situational and developmental stress" (Olson et al., 1992, p. 1). Family cohesion is the "emotional bonding that family members have toward one another" (Olson et al., p. 1). Family communication is described as the facilitator for change in family adaptation and cohesion (Olson et al.).

Patient psychological well-being refers to the frequency and intensity of a general positive affect, emotional control, and feelings of belonging (Ware, Snow, & Kosinski, 2000). For purposes of this study the Mental Health Index-5 (MHI-5), a subscale of the SF-36 Health Survey, was used to measure psychological well-being.

Assumptions

For the purpose of this study, the following assumptions were made:

1. Coronary artery bypass graft surgery is a significant stressor event for patients and their families.
2. Patient self-reports of family stressors and family adaptation are a reflection of the family unit.
3. A change in the physical and emotional health of one family member affects other family members.
4. Family stressors affect not only the family unit but also individual family members.
5. Family stressors, family adaptation, and patient psychological well-being can be measured.

Summary

Psychological well-being has been identified as a source of concern for CABGS patient and their families. The problem identified for this study was the lack of knowledge related to the pile-up of family demands encountered by elderly CABGS patients and their families, family adaptation, and the effect of family adaptation, and the effect of family adaptation on patient psychological well-being during early recovery. Various factors contribute to this problem, including an increasing number of older adults, the trend towards early discharge, and changes in the characteristics of patients undergoing CABGS. Using a modification of the Double ABCX Model of Family Stress by McCubbin as a conceptual framework, four research questions and related hypotheses were identified.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this chapter was to provide a review of the literature related to concepts central to the study. The literature review is arranged into four categories: early discharge of cardiac surgery patients, the psychological well-being of the CABGS patient, the pile-up of family demands, and family adaptation.

Early Discharge of Cardiac Surgery Patients

Advances in health care technology and economic pressures to reduce costs of CABGS have resulted in a significant reduction in PLOS for patients undergoing CABGS. The impact of early discharge has been, and continues to be, assessed. A significant area of concern with the implementation of early discharge has been the impact on patient outcomes. Patient mortality rates, readmission rates, and postoperative complications are three clinical outcomes potentially affected by early discharge following CABGS.

An 18% decline in the average length of stay for Medicare patients following CABGS between 1982 and 1992 was the impetus for a study that examined the impact of early discharge on patient mortality and readmissions. Using a national database of Medicare discharges, investigators examined mortality rates and hospital readmissions for nearly 94,000 Medicare patients (64 years of age or older) undergoing CABGS in 1992 (Cowper et al., 1997).

Specific outcomes of interest in this study were patient deaths within 60 days of discharge and readmission to the hospital for cardiovascular postoperative problems within 60 days of discharge. Results of the analysis found that 1% of patients in the sample died within 60 days of discharge; 18% of those died during the first week after discharge. The readmission rate for this same sample was 18%. The mortality and readmission rates were found to be no higher than previous studies examining similar outcomes prior to changes in length of stay (Cowper et al., 1997).

A more detailed examination of LOS for this population found that 60% of patients in the sample were discharged between 6 and 8 days after surgery; 6% were discharged within 5 days of surgery. Patients discharged earlier tended to be younger, male, have fewer comorbidities, and were not admitted prior to surgery with an acute myocardial infarction (MI). Other factors identified as predictors of PLOS include prolonged stays in the intensive care unit (ICU), postoperative atrial fibrillation, preoperative congestive heart failure, history of peripheral vascular disease, and combined CABGS and valvular procedures (Johnson & McMahan, 1997; Nickerson, Murphy, Davila-Roman, Schechtman, & Kouchoukos, 1999).

Cowper et al. (1997) found that patients with a shorter average PLOS (5 days or less) were less likely to have a negative clinical outcome (mortality or readmission) than patients with an average PLOS (6 to 8 days). Patients with a longer than average PLOS (9 to 14 days) had an increased likelihood of adverse outcomes compared to those with an average PLOS (Cowper et al.). The increased mortality and readmissions associated with longer PLOS may be due to a more complicated intraoperative and postoperative course secondary to increased age and the presence of comorbidities. The findings of gender as another variable associated with early discharge, increased readmissions, and increased

mortality was consistent with other studies that have found that female cardiac surgery patients tend to be older and have an increased incidence of comorbidities (Moore, 1995; Philippides & Jacobs, 1995).

In addition to PLOS, specific patient characteristics associated with increased mortality within 60 days of discharge included increased age, diabetes, congestive heart failure, peripheral vascular disease, and cerebrovascular disease. Patient variables associated with cardiovascular readmission or death included all of the preceding variables along with female gender, chronic pulmonary disease, and PLOS. Complications related to cardiovascular disease (51%), pulmonary disease (13%), and cerebrovascular disease (3%) were the most frequent readmission diagnoses (Cowper et al., 1997).

The study provided evidence of positive patient outcomes related to mortality and readmission with early discharge for specific types of patients; however, there are limitations to the study. Sample characteristics limit the generalizability of the findings to the general population. The sample was limited to patients 65 years of age or older. Outcomes may differ in a younger population who tend to be discharged earlier. Ninety-four percent of the sample were Caucasian; 68% were male. Cultural variances on PLOS and clinical outcomes were not identified. Male gender was identified as one characteristic associated with earlier discharge; however, conclusions about gender differences must be made with caution due to the demographics of the sample.

The investigators acknowledged that their sample had far fewer risk factors than the general population of cardiac surgery patients. The most common comorbid illnesses were diabetes (21%), congestive heart failure (16%), cerebrovascular disease (7%), peripheral vascular disease (6%), and chronic obstructive pulmonary disease (4%). Fifty-five percent had no comorbid diseases (Cowper et al., 1997). As the number of older pa-

tients having CABGS increases, the recovery process becomes more complex due to the presence of more comorbidities. The increased complexity of recovery has implications for patients and families who must manage recovery at home.

Clinical outcomes were limited to mortality and readmissions. The design of the study did not allow for the examination of other outcomes, such as the use of health care resources after discharge, quality of life issues, or other problems not requiring hospitalization. Data were limited to that available in the database. Reliability and validity information were not reported for the database. Characteristics of the hospitals performing the procedures were not identified. The effect of differences in preoperative, intraoperative, and postoperative care on the study outcomes is unknown. Finally, no information is available regarding resources used or needed after discharge that may have impacted the clinical outcomes.

Despite these limitations, the findings of the study provide information regarding the characteristics associated with increased probability of death and the complications associated with readmission. Results of this study suggest that gender, the presence of chronic illness, and increased age are important variables to be considered in preparing patients and families for discharge.

In another study examining patient outcomes, Deaton et al. (1998) evaluated the relationship between LOS and baseline health status and health status and readmission rates 3 months after discharge. Similar to the findings of Cowper et al. (1997), readmitted CABGS patients were found to have had a longer PLOS than patients not readmitted. Forty-five percent of patients who had a PLOS of 8 or more days were readmitted; patients with a PLOS of 5 to 7 days had a readmission rate of 18%.

Patient health status appears to be another variable affecting readmission rates. Deaton et al. (1998) used the Health Status Questionnaire 12 to measure the effect of illness on patient health status during hospitalization and 3 months after discharge. The instrument measures eight scales to determine health status, including physical functioning, role-physical, bodily pain, health perception, energy/fatigue, social functioning, role–mental, and mental health.

Health status scores improved from baseline to 3 months following surgery. Significant improvement was evident 3 months after surgery in the areas of social functioning, role-mental, and bodily pain. Gender differences in health status, present at baseline measurement, continued to be seen 3 months after discharge. Baseline Health Status Questionnaire 12 scores were generally lower for women than men; significant differences were found for health perception and social functioning. Health status scores for male patients were significantly higher than female scores on all scales at 3 months (Deaton et al., 1998).

Patients who were readmitted tended to have lower baseline scores on all subscales related to health status; however, the only significant difference was in scores scale for bodily pain. At 3 months, all health status scores were significantly lower for patients who had been readmitted compared to those patients who were not readmitted. Patients with preoperative heart failure and female patients also were more frequently readmitted (Deaton et al., 1998).

Deaton et al. (1998) also examined the relationship between health status and PLOS. While findings were not statistically significant, baseline scores for patients with the shortest PLOS were higher in energy/fatigue, physical functioning, and health perception than those patients with the longest PLOS. At 3 months, patients with the shortest

PLOS scored significantly higher for energy/ fatigue, physical functioning, role- physical, and social functioning than patients with the longest PLOS. These findings suggest that the preoperative health status of patients is an important determinant in identifying those at risk for postoperative complications that may require readmission.

Limitations of the study include a small convenience sample of 100 patients. Of the 100 patients, only 19 were women, and 24 of the 100 patients were readmitted. This small sample size limits our ability to compare patient groups such as men and women or readmitted patients and those patients not readmitted. Determination of the relationship between age and readmission rates may have also been limited due to the small sample size. No normative data is available on the instrument used to measure health status, thereby limiting the validity of the instrument (Deaton et al., 1998). The results of this pilot study do suggest, however, a relationship between patient health status and recovery. These findings support those of other studies indicating that gender and overall health are variables affecting recovery from CABGS (Cowper et al., 1997; Moore, 1995; Philippides & Jacobs, 1995). Unlike the findings of Cowper et al., age was not a variable associated with readmission, thus raising questions about the effect of age on clinical outcomes.

The relationship between PLOS and increased readmission (Cowper et al., 1997; Deaton et al., 1998) and PLOS and increased mortality (Cowper et al.) may be an indication of increased patient acuity or patients who developed postoperative complications requiring more extensive acute care. Length of stay may, therefore, be an important variable to consider in assessing or anticipating stressors that may occur during the transition from an acute care setting to the home.

Increased age, female gender, and the presence of comorbidities such as diabetes, congestive heart failure, peripheral vascular disease, and cerebrovascular disease have been identified as likely factors for increasing mortality and readmissions (Cowper et al., 1997; Deaton et al., 1998). Similar factors were found to be obstacles to early discharge after cardiac surgery. Additional research is needed to determine how patient characteristics associated with increased negative outcomes influence family adaptation and patient recovery.

While many studies have examined the relationship between physical characteristics and clinical outcomes, fewer studies have addressed the relationship between clinical outcomes and psychological well-being. Sauer et al. (2001) found that mental health was significantly related to readmission to the hospital within 6 months after discharge following CABGS. The study examined the impact of specific clinical variable on preoperative and postoperative depression in CABGS patients. Data were collected from 416 patients undergoing CABGS. Clinical variables of interest were length of stay, readmission rates, and mortality. The MHI-5 of the SF-36 Health Survey was used to collect data preoperatively and at 6 weeks postoperatively. The subscale is comprised of five items addressing anxiety, depression, loss of behavioral control, and psychological well-being (Sauer et al.).

The median score for the subscale item asking how often the patient had felt "down in the dumps" was 5 (a little of the time); the median score for how often they had felt "downhearted and blue" was 6 (none of the time). The median score on the MHI-5 was 72 with a range of 60 to 84, with the higher scores indicating less mood disturbance. The frequency of depressive symptoms for the study population was 10% to 11% (Sauer

et al., 2001). The findings suggest that psychological well-being also may affect important clinical outcomes.

Summary

Early discharge is associated with positive clinical outcomes for many patients following CABGS. Multiple studies have concluded that early discharge has no negative effect on postoperative mortality and readmission rates. In particular, a PLOS of 5 days or less is considered safe for younger, male patients without comorbid illnesses.

Patients most at risk for an adverse outcome are those who have a longer PLOS, are older and female, and who have other comorbidities. The comorbidities most frequently identified as factors either increasing PLOS or negatively affecting mortality and readmission rates include diabetes, congestive heart failure, peripheral vascular disease, and cerebrovascular disease. More information is needed about the population of CABGS patients who have these risk factors that may negatively impact their recovery.

The studies reviewed addressed the effects of early discharge on clinical outcomes related to the physical well-being of CABGS patients. Variables identified as influencing these clinical outcomes also have the potential to affect another aspect of recovery, psychological well-being. Additionally, illness-related variables such as PLOS, presence of comorbidities, and postoperative complications can contribute to the pile-up of family stressors, therefore potentially altering family adaptation.

Psychological Well-Being of the Patient During Early Recovery

Mood changes, including depression, anxiety, and other "negative" emotions, have been identified as sources of concern for both patients and families during early re-

covery. Patients have reported a variety of emotional reactions during early recovery, ranging from anxiety, sadness, and "crying a lot" (Jaarsma et al., 1995) to mild and moderate depression (King & Parrinello, 1988; Sauer et al., 2001; Sauve' & Fortin, 1996). While findings of some studies indicate that emotional reactions such as anxiety and depression are not a significant problem (Artinian et al., 1993; Cronin et al., 1997; Sauer et al., 2001), other studies have reported that as many as 60% of CABGS patients may experience mood alterations during recovery (Burker et al., 1995; Moore, 1995). Dealing with these emotional reactions can be stressful for patients and families, potentially affecting physical recovery of patients, as well as the ability of families to adapt to the stressful event of CABGS.

In an early study examining patient perception of recovery over a 2-month period following CABGS, King and Parrinello (1988) found that mood fluctuations were most common during the first 3 weeks. Changes in mood reported by study participants included anxiety, nervousness, and being "down." In this descriptive study, investigators interviewed 34 participants via telephone once a week for 4 weeks, then every other week for 4 weeks. During the first week after discharge, 41% of participants reported mood fluctuations; this number decreased to 38% by the second week; however, during the third week, the number of patients complaining of mood problems increased to 53%. During the remaining time of data collection, the percentage of patients reporting mood changes leveled of at 24% (King & Parrinello). These findings, again, suggest that the first 3 weeks after discharge is a time when patients experience mood alterations. Furthermore, the negative emotions appear to increase after the time of discharge.

Variables that may affect psychological well-being, such as patient characteristics, were not examined. Other limitations include the small convenience sample, which

may increase sampling error. Due to selection biases, CABGS patients participating in the study may have differed from nonparticipants on important characteristics. Additionally, the same interview schedule developed for the study was used for each of the six data collections. The repeated use of the instrument may have elicited what participants perceived as expected responses.

Later studies have, however, supported the findings of King and Parrinello. Subjects in a descriptive study by Moore (1994) related the physical sensations, emotions, and concerns they experienced during the first month following CABGS. The investigator interviewed participants one day prior to discharge, 2 days after discharge, and 3 weeks after discharge. A structured interview guide developed by the investigator was used. The first two interviews were done face-to-face; the final interview was done via telephone. The sample for the study was comprised of 15 men and 5 women who had CABGS for the first time. Ages of the participants ranged from 51 to 76 years of age. All participants were married. The average length of hospital stay after surgery was 9.3 days with a range of 6 to 17 days (1994).

Subjects described their emotional feelings at time of discharge as excited (80%), depressed or feeling down (50%), and anxious or worried (40%). Thirty percent described feelings of irritability at time of discharge. Two days after discharge, 40% described feelings of irritability, 30% described mood swings, and 30% complained of anxiety. Twenty percent expressed feelings of anger and depression. By the third week after discharge, 75% of participants expressed feeling depressed, 60% experienced irritability, and 50% complained of mood swings. Additional feelings experienced by patients included anger (40%) and anxiety (25%) (Moore, 1994).

In another descriptive study comparing the physical and psychological problems of cardiac patients in early recovery after CABGS or MI, 52% of CABGS patients reported problematic emotional reactions, ranging from being anxious, frightened, and crying a lot, to sadness and depressive feelings (Jaarsma et al., 1995).

Patients were interviewed in their homes 6 months after surgery using a semi-structured interview questionnaire developed for the study. In addition to evaluating the incidence of problems with emotional reactions, data were further analyzed to determine if problems experienced by patients differed based on diagnosis. Emotional reactions, expectations of the future, and problems related to families and friends varied significantly depending on procedure group. Patients who had an MI and no surgery experienced more problems in all three of these areas than the other two groups. However, problems related to emotional reactions still occurred in 52% of patients who had CABGS and 49% of patients who had CABGS following an MI (Jaarsma et al., 1995).

The convenience sample for the study consisted of 82 patients, 35 who had CABGS and no MI, 23 patients who had CABGS with an MI, and 24 patients who had an MI but no surgery. The sample was limited to patients with no coexisting chronic, debilitating disease or psychiatric illness. Sample characteristics were similar to King and Parrinello (1988) and Moore (1994), with 89% of the sample being male. The average age of the patients was 61.8 years, with most being married. (Jaarsma et al., 1995).

Not all of the emotional reactions experienced by patients following CABGS are negative in nature. A qualitative study by Goodman (1997) found that the psychological state of patients, whether negative or positive, was a common theme for patients when describing their recovery experience. Subjects kept a diary during the first 6 weeks at home following CABGS and participated in an interview at the end of the 6 weeks.

Analysis of the diaries identified 14 themes related to physical and psychosocial well-being. Feelings expressed in the diaries included those of irritability, apathy, mood swings, and feelings of detachment. Content of the diaries and interview also identified expressions of positive feelings related to being at home and being alive (Goodman, 1997). Similarly, Moore (1994) found that 80% of patients reported feelings of excitement at the time of discharge; however, at later interviews the positive feelings were no longer reported.

Generalizability of findings of all these studies is limited by sample characteristics, sampling method, and exclusion criteria that restricted participants to patients without chronic or debilitating illnesses. Findings may differ with a sample more reflective of the current CABGS patient population, hence more information is needed about the emotional reactions of a CABGS population that is older and coping with other chronic illnesses. Comparison of results must be made cautiously, as findings from each study are based on data collected from semistructured interview questionnaires developed specifically for the study. The reliability and validity of the interview schedules is unknown. Additionally, the time of data collection varies among the studies, limiting comparisons. The study designs prevent control of external factors such as environmental influences that may affect findings. Despite the limitations, these qualitative, descriptive studies provided strong evidence that mood fluctuations are of concern during early recovery following CABGS. Further, results indicated that the first 3 weeks at home may be a time when patients are most affected by these emotional reactions.

Other studies have focused on more quantitative assessments of the incidence of depression following CABGS. In a longitudinal study, Burker et al. (1995) examined the occurrence of depression in male and female patients undergoing cardiac surgery. The

sample for the study consisted of 141 patients, 81 men and 33 women, undergoing elective CABGS, valve repair, or combined CABGS and valve repair. The mean age of the sample was 61.4 years, with the majority being married. Patients were excluded for history of stroke or major psychiatric illnesses (Burker et al.).

Data were collected on the day prior to surgery and at the time of discharge. Psychological well-being was assessed using the Center for Epidemiological Studies – Depression Scale and the Spielberger State-Trait Anxiety Inventory. Additionally, the Perceived Social Support Scale was used to measure social support from friends, family, and significant others. Physiological variables measured included ejection fraction, medical history of MI, stroke, hypertension, diabetes, previous cardiac surgery, and the New York Heart Association Functional Classification for angina and congestive heart failure. Data on cross-clamp time and time on cardiopulmonary bypass also were collected (Burker et al., 1995).

No differences between surgical procedures on measures of depression or anxiety were found; therefore, analyses were conducted with the data combined from all groups. Study participants with a Center for Epidemiological Studies – Depression Scale score of 16 or higher were classified as depressed; scores below 16 were classified as non-depressed. Prior to surgery, 46% of the participants were classified as depressed based on their score; postoperatively, 60% of the participants were classified as depressed. The difference between the preoperative score and postoperative score was statistically significant (Burker et al., 1995).

Linear regression procedures were used to examine factors predictive of preoperative depression. Variables found to be independently associated with higher levels of depression preoperatively included female gender, higher levels of state and trait anxiety,

and perception of less social support (Burker et al., 1995). No significant relationship was found between depression and age, marital status, or years of education. Of the physiologic variables examined, the only significant difference between the depressed and non-depressed group was on the New York Heart Association angina score. Patients classified as depressed tended to fall in the class IV category indicating worse chest pain. Preoperative depression, postoperative state anxiety, and the presence of diabetes were found to be associated with higher levels of postoperative depression (Burker et al., 1995).

Findings comparing gender may have been affected by the unequal distribution of men and women in the sample. Furthermore, the last data collection was done at the time of discharge, providing no information regarding the incidence of depression after that time.

Timberlake et al. (1997), however, studied the incidence of depression and anxiety in 121 CABGS patients beyond the day of discharge. Depression and anxiety were assessed preoperatively and at 8 days, 8 weeks, and 12 months postoperatively. The Beck Depression Inventory (BDI) was used to measure depression, and the Spielberger State-Trait Anxiety Scale was used to assess anxiety. The incidence of preoperative depression for the study population was 37%; the incidence increased to 50% at 8 days postoperatively and then decreased to 24% at 8 weeks and 23% at 12 months. Preoperative depression was positively associated with higher levels of postoperative depression at all data collection periods (Timberlake et al.).

Patients with depression 8 days after surgery had significantly higher preoperative scores on the BDI and for state and trait anxiety. Patients with depression 8 days postoperatively did not differ from those without depression on age, number of grafts performed, or gender. Using a stepwise logistic regression analysis to identify variables pre-

dictive of postoperative depression, preoperative BDI, and the number of grafts performed correctly classified 67% of depressed cases and 62% of nondepressed cases (Timberlake et al., 1997).

A similar relationship between preoperative and postoperative depression was found at 8 weeks after surgery. Additionally, age also was found to be a predictor of postoperative depression at 8 weeks, with depressed patients being older than patients who were not depressed. No differences between the depressed group and those without depression were found relative to gender, number of grafts performed, number of vessels diseased, or bypass time (Timberlake et al., 1997).

The mean age of participants in the study by Timberlake was 56 years of age. This is a younger population than that of Burker et al. (1995). The incidence and patterns of depression and anxiety may differ for a population that is older. Findings about the role of gender in the incidence and pattern of depression also may have been affected by the distribution of men (N = 109) and women (N = 12). The higher number of men than women in studies of CABGS patients is, however, common and reflective of the general CABGS population.

Despite the findings of the preceding studies, other researchers have found that that the incidence of emotional responses may not be a significant problem. In a study examining the psychosocial and functional outcomes of CABGS in women, investigators found a low incidence of depression during recovery (Cronin et al., 1997). The population for the longitudinal descriptive study was comprised of 56 women without comorbidities who underwent CABGS for the first time. Data were collected prior to discharge and at one and 3 months postoperatively. Psychosocial outcomes were assessed using two subscales from the Profile of Mood States (POMS) instrument: tension and de-

pression. Tension scores range from 0 to 40, with low scores indicating less tension. Scores on the depression subscale can range from 0 to 56 with low scores, again, indicating less depression. Functional outcomes were measured using four subscales of the Sickness Impact Profile: home management, social interaction, recreation, and return to work. Scores on the Sickness Impact Profile subscales range from 0 to 100, with the higher score indicating more disruption in activities due to illness (Cronin et al.).

Evaluation of the two POMS subscale scores indicated that patients in this sample were experiencing low levels of depression and tension. The low incidence of depression may be a reflection of the study population of female CABGS patients. Repeated measures analysis of variance indicated no significant differences over time for either tension or depression (Cronin et al., 1997).

A limitation of the study was the exclusion of patients with comorbidities. Female CABGS patients generally have more comorbidities and physical problems preoperatively and postoperatively (King, Clark, Norsen, & Hicks, 1992; Miller & Grindel, 1999); therefore, the incidence of emotional reactions in patients with a recovery complicated by the presence of comorbid illnesses may differ from patients with no comorbidities.

Artinian et al. (1993) also found that depression was not a significant problem during recovery. Using a repeated measures design, investigators examined the effects of age differences on physical and psychological recovery patterns. The convenience sample for the study comprised 258 patients undergoing CABGS for the first time. Physical recovery was assessed using three subscales of the SIP: ambulation, sleep-rest, and body care and movement. In addition, a 20-item survey developed by Artinian also was used to assess symptoms specific to cardiac recovery. The patient's perception of physical recovery was assessed using a Cantril ladder. Psychological and social recovery were meas-

ured using the BDI and the Rosenberg Esteem Scale. Data were collected prior to discharge and at one, 3, and 6 weeks after discharge. The mean BDI score was 9.53 for patients under the age of 60, 8.50 between 60 and 70 years of age, and 9.15 over the age of 70, reflecting low levels of depression. Patient perception of mental health was fairly high at all three times of data collection. Analysis of scores from the Rosenberg Self-Esteem tool found no patterns relevant to age or time (Artinian et al.).

Differences between the age groups were evaluated using a mixed –design, repeated- measures multivariate analysis of variance (MANOVA). The sample was divided into three groups based on age: those less than 60 years of age, those between 60 and 70 years of age, and those over the age of 70. Data were analyzed comparing the three groups. Neither between age groups effect or interaction effects were found. A within-groups effect was found for BDI score and patient perception of mental health, indicating that symptoms of depression diminished over time (Artinian et al., 1993).

While some studies have indicated that the frequency of mood alterations is not very high following CABGS, many others have shown that mood disturbances, including depression, occur frequently enough to be of concern. Expanding on these findings, additional studies have examined patient characteristics that may affect psychological well-being during recovery. Many studies have indicated that age is not a significant variable affecting psychological well-being following CABGS. Neither Burker et al. (1995) or Timberlake et al. (1997) found age to be a factor when comparing depressed and non-depressed patients in early recovery. Timberlake et al. did find, however, that at 8 weeks after surgery, patients who were depressed were older than nondepressed patients. Likewise, Artinian et al. (1993) found that, while depression improved over time for all age groups, no differences between age groups were identified.

Similar results were found by Barnason, Zimmerman, Anderson, Mohr-Burt, and Nieveen (2000), who used a prospective, repeated-measures design to examine the impact of select patient characteristics on the functional outcomes of CABGS patients. The study sample was comprised of 47 patients, with a mean age of 66 years, ranging from 37 to 81 years of age. All were Caucasian, and 77% were married (Barnason et al.).

Data on functional outcomes were collected using the SF-36 Health Survey and the Modified 7-Day Activity tool. The SF-36 Health Survey consists of 8 subscales measuring various facets of health, including general health, functional status, and well-being. Subscales for functional status include assessments of physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, and bodily pain. Mental health, energy, and fatigue are the subscales addressing well-being. The Modified 7-Day Activity tool examines patient recall of light, moderate, and hard activities they have participated in over the previous 7 days, as well as the number of hours spent sleeping or at rest. Data were collected prior to discharge and via telephone interviews at 3, 6, and 12 months postoperatively (Barnason et al., 2000).

Baseline scores on the SF-36 Health Survey subscales were lower than scores at 3, 6, and 12 months for all subscales except role-emotional. At 3 months, all subscales except for social and general health functioning were lower than scores at 6 or 12 months. As recovery progressed, scores for each of the eight subscales significantly improved (Barnason et al., 2000)

One-way analysis of variance and repeated measures ANOVA were done to determine if functional status varied by age, gender, or presence of comorbidities. No differences in functional outcomes were found based on age at any time for any of the SF-36 Health Survey subscales. A significant interaction effect was found between gender and

the physical subscale. Further analyses indicated that the differences by gender were in the preoperative baseline scores on the subscale. Preoperatively, men had a significantly higher score on the physical subscale than women (Barnason et al., 2000).

Similar findings came from a study that explored uncertainty and psychological stress following coronary angioplasty and CABGS. In this comparative study of 22 angioplasty patients and 25 CABGS patients, the investigators examine differences in uncertainty and psychological stress. Participants were interviewed at home 1 and 3 months after being discharge following a coronary angioplasty or CABGS (White & Frasure-Smith, 1995).

Data were collected using the Mishel Uncertainty in Illness Scale, the General Health Questionnaire, and the Perceived Social Support Scale. The Mishel Uncertainty in Illness Scale was designed to measure uncertain experienced by hospitalized patients. The General Health Questionnaire was used to assess symptoms of psychological distress such as worry, inability to concentrate, loss of sleep, and loss of confidence. The Perceived Social Support Scale was developed specifically for patients with heart disease to measure social support (White & Frasure-Smith, 1995).

One-way analysis of variance revealed a significant main effect between uncertainty the type of procedure, with angioplasty patients experiencing more uncertainty than CABGS patients. A significant main effect also was found for uncertainty and social support. Angioplasty and CABGS patients with lower social support had higher uncertainty than patients with higher social support (White & Frasure-Smith, 1995).

Analysis of variance for General Health Questionnaire scores found a significant main effect for time and social support. A significant interaction effect was found between procedural group and social support. These scores, reflective of psychological

stress, decreased over time. Similar to the relationship between uncertainty and social support, patients with lower social support had more psychological stress. A significant interaction effect was found between procedural group and social support, as the association between social support and psychological stress was more pronounced in the angioplasty patients (White & Frasure-Smith, 1995).

Data were further analyzed to determine whether findings were a result of differences in patient characteristics between the angioplasty and CABGS groups. Analysis of covariance indicated that differences in uncertainty and psychological stress were not due to age, the number of arteries treated, the medications used for treating dysrhythmias, or the timing of the first interview (White & Frasure-Smith, 1995).

Interpretation of results is limited by several factors. A power of .85 was calculated based on large effect differences. Medium and small differences may have been undetected. The inability to randomly assign individuals to procedural groups may have affected responses. The groups differed on several characteristics. The CABGS patients were older, had more coronary arteries treated, were more likely to have been treated for dysrhythmias, and had their first interview later than the patients having coronary angioplasty. Angioplasty patients were more likely to perceive less social support than the CABGS patient (White & Frasure-Smith, 1995). While analyses indicated that these variables did not affect results, there may have been other variables, not measured in this study, which contributed to the findings.

Rankin (1990) also found that age was not a factor affecting mood disturbances when comparing patients between the age of 30 to 55, 56 to 69, and 70 to 81 years. While not statistically significant, patients over the age of 70 tended to have lower levels of mood disturbances than younger patients. Lower levels of mood disturbance in older

CABGS patients were also found by investigators comparing patients 65 years of age and older to patients under the age of 65. CABGS patients over the age of 65 were found to have better mental health scores than younger patients (Guadagnoli, Ayanian, & Cleary, 1992).

Age has been recognized as an important variable affecting physical well-being following CABGS, with older patients experiencing more complications and prolonged recovery. The impact of age on psychological well-being is less clear. While many studies indicate that there is no difference based on age, others suggest that, unlike physical well-being, older CABGS patients actually have better mental health during recovery.

The relationship between gender and postoperative psychological well-being also is unclear. While some results have indicated no association between gender and psychological well-being (Barnason et al., 2000), other studies have reported that men have more negative emotional responses during recovery (Moore, 1995; Rankin, 1990); still others have reported that women have more problems with depression and other mood disturbances (Burker et al., 1995).

Using a prospective, cohort design, Rankin (1990) compared psychosocial and physiological aspects of recovery in men and women during recovery following CABGS. The POMS was used to assess mood disturbances. Physiological data were collected via the New York Heart Association functional status criteria and the medical record. Data were collected during an initial interview prior to discharge and at one and 3 months after discharge from 117 patients via telephone interview and mailed questionnaires.

Preoperatively, female patients were found to have lower POMS scores than male patients at 1 and 3 months, indicating less mood disturbances. Significant differences between females and males over time were found for POMS subscales of anxiety, anger,

and depression. These findings suggest that men are more prone to feelings of anxiety, anger, and depression during recovery. Limitations of the study include an unequal distribution of males (N = 93) and females (N = 24) in the sample that may have affected results. Additionally, while the results indicate differences in psychological variables between males and females, the influence of other variables, such as physiological characteristics, on mood state were not examined.

In a study comparing physical and emotional reactions of 20 women and 20 men following CABGS, Moore (1995) also found that men more commonly reported depression, irritability, and anger than women throughout early recovery. Patients were interviewed at time of discharge, 2 days after discharge, and 3 weeks after discharge. At all three times, the incidence of depression, irritability, and anger was higher for men than women. At week 3, 70% of men reported symptoms of irritability and 75% reported experiencing depression, compared to no women reporting irritability and 30% reporting symptoms of depression. At time of discharge, 80% of men reported feelings of excitement compared to 0% of women. The feelings of excitement disappeared quickly; excitement was no longer an emotion expressed by men or women by the second day after discharge. Negative emotions reported by women decreased over the time of recovery, while reports of anger, depression, and irritability increased throughout the first month for men (Moore).

The findings of Rankin and Moore differ from those of Burker et al. (1995), who found females experienced more depression than males preoperatively as well as postoperatively. Female gender was found to be significantly predictive of preoperative depression. Physiological differences between females and males may account for this gen-

der difference in depression. Barnason et al. (2000) and Timberlake et al. (1997), however, found no differences in patient perception of mental health or depression.

Many studies have examined the affects of age and gender on physiological outcomes following CABGS; however, understanding of the influence of age and gender on psychological well-being during early recovery is limited. Conclusions about the role of age and gender are generally made from studies that include psychological well-being as one of many variables being studied. Various instruments and time frames have been used to assess psychological well-being, making it difficult to compare findings. No studies have specifically examined the relationship between family and the psychological well-being of older CABGS patients.

Additional patient variables that may affect postoperative psychological well-being are preoperative health and the presence of comorbidities. While the association between comorbidities and physical well-being postoperatively is fairly well supported (Finkelmeir, Kaye, Saba, & Parker, 1993; King et al., 1992; Miller & Grindel, 1999), less is known about the relationship between preoperative health, comorbidities, and psychological well-being. Barnason et al. (2000) found no significant interaction between comorbidities and mental health; however, Burker et al. (1995) found that diabetes was significantly associated with higher levels of postoperative depression. It is unclear why diabetes was a factor but not other comorbidities. As the number of older CABGS patients with multiple other physical ailments continues to increase, more information is needed about this relationship.

Social support and preoperative depression are additional variables that have been found to affect postoperative psychological well-being. White and Frasure-Smith (1995) found that patients with high social support had fewer symptoms of psychological dis-

tress. Burker et al. (1995) also found that perception of less social support was significantly related to higher levels of depression preoperatively but not postoperatively. Postoperative depression, however, was significantly associated with higher levels of state and trait anxiety.

Preoperative depression has been identified as an important predictor of postoperative depression (Burker et al., 1995; Sauer et al., 2001; Timberlake et al., 1997). Sauer et al. found that depressive symptoms postoperatively were significantly correlated with preoperative scores on the "down in the dumps" and "downhearted and blue" questions of the MHI-5, as well as the overall MHI-5 score.

The findings of Sauer et al. (2001) supported those of Timberlake et al. (1997) and Burker et al. (1995). Preoperatively depressed patients were found to have a higher incidence of postoperative depression than patients who were nondepressed preoperatively. Sixty-eight percent of patients who were depressed preoperatively experienced postoperative depression at 8 days, compared to 40% of patients who were not depressed preoperatively (Sauer et al.). Similar results were found when comparing postoperative depression at 8 weeks and 12 months (Timberlake et al.).

Summary

The studies reviewed indicate that the incidence of alterations in psychological well-being is of concern. Findings related to the factors that may increase the risk of mood disturbances during early recovery following CABGS is contradictory. While these studies have focused on patient variables such as age and gender, there is a lack of knowledge about the impact of family stress on the psychological well-being of CABGS patients.

The highest incidence of emotional reactions appears to be during the first 3 weeks after discharge. Understanding of the relationship between family stress, family adaptation and psychological well-being of CABGS patients during this time will assist health-care providers in better preparing patients and families for managing problems related to these emotional reactions.

Pile-Up of Family Demands

The Double ABCX model of family stress proposes that families have to deal with more than just the stress of the situation. The accumulation or pile-up of hardships, prior strains, and concurrent stressors create demands on the family that also contribute to the family response to a potential crisis situation. The stressful events of illness, hospitalization, and discharge have the potential to create a pile-up of stressors for the family that can strain their resources and coping mechanisms. Contributing to the pile-up of demands are the prior strains within the family that are created by normative transitions, concurrent stressors, and the consequence of coping. In the following section, the hardships and strains experienced by the family due to coronary artery bypass graft surgery (CABGS) will be discussed.

Family Demands Prior to Discharge

Multiple researchers have sought to identify stressors families encounter prior to CABGS and during the time of hospitalization (Artinian, 1989; Cozac, 1988; Gillis, 1984; Langeluddecke, Tennant, Fulcher, Barid, & Hughes, 1989). Four themes emerge from the literature regarding family stress during the preoperative period and time of

hospitalization: the stress of waiting, hospital environment as a stressor, alterations in family function, and family response to these stressors.

Waiting has been identified as a major stressor for families during the preoperative and intraoperative periods. Waiting for surgery and waiting to know the short-term and long-term outcomes of the surgery are stressors for families (Artinian, 1989; Cozac, 1988; Gillis, 1984). In an early study on the impact of cardiac surgery on families, Gillis examined family stress during and after CABGS. The purpose of the descriptive longitudinal study was to describe the major sources of stress for families from the time of finding out that surgery was needed through the recovery period. A secondary purpose of the study was to examine the level of subjective stress and the relationship between patient and spouse subjective stress.

For this study, family was defined as the patient and spouse. Patients and spouses were interviewed during the period of hospitalization and 6 months following surgery. The initial interview, conducted 3 to 8 days after surgery, focused on events experienced by patients and spouses leading up to surgery and any changes that might have occurred in the family as a result of the illness. The second interview, conducted in the home 6 months later, focused on the experiences of patients and spouses during the period of recovery.

The most frequent stressor identified by spouses prior to hospitalization was waiting for surgery. For some patients and spouses, the stress associated with waiting was related to the severity of illness. Patients had been "turned down" by some surgeons because of the illness severity and families reported feeling "desperate" to find a surgeon who would perform the surgery (Gillis, 1984).

Families also described waiting as a source of stress in a study by Artinian (1989). In this study, family members were interviewed while the family member was in surgery. Family members participating in this qualitative study identified waiting as the primary stressor during this time. While waiting for the day of surgery was the primary stressor in the study by Gillis (1984), the stress associated with waiting was now centered on the uncertainty of the outcome of the surgery. In addition, the waiting and uncertainty about how their lives would be affected after the surgery was another source of stress for families (Artinian, 1989). The difference in time frame for data collection is likely to have influenced family responses regarding stressors.

The stressors associated with the preoperative experience and while waiting during the surgical procedure also were described in a study by Cozac (1988). Using a qualitative design, spouses of CABGS patients were interviewed about their experiences during the time of hospitalization. Spouses were interviewed twice; the first time being 2 days after the patient had been transferred to the ICU and again 3 or 4 days later.

Analysis of the interviews revealed spouses found waiting for the day of surgery to be very stressful during the preoperative period. As in the study by Gillis (1984), spouses were concerned that the condition of their mate would deteriorate before the surgery could be performed. While the spouses were anxious about the surgery, they were also hopeful about the outcome. Waiting during the surgery was identified as the most stressful time during the period of hospitalization. Anxiety and fear were the predominant emotions expressed by spouses (Cozac, 1988).

The emotions expressed by spouses in the study by Cozac (1988) are common family responses to the stressors of waiting. Emotions experienced by family members while waiting for the day of surgery include anxiety, depression, and fear related to not

knowing what was happening or what the outcome of the surgery would be. Not unexpectedly, spouses of CABGS patients waiting for surgery have been reported to have higher state anxiety levels and depression scores than the general population (Langeluddecke et al., 1989). Fear and ambivalence have also been described as emotions experienced by family members when finding out a family member was to have cardiac surgery (Artinian, 1989; Cozac, 1988). The surgery was perceived as a threat to the life of a family member, yet there was hope for the success of the operation.

Psychosocial and family functioning may also be altered while waiting for surgery. In a study that assessed psychological and social functioning in spouses of cardiac surgery patients, investigators found that spouses of CABGS patients had significant psychological morbidity prior to surgery (Langeluddecke et al., 1989). This study assessed psychological and social functioning in spouses of CABGS patients one week prior to the surgery and 12 months after the procedure. Psychosocial and social functioning were assessed using the Psychosocial Adjustment to Illness Scale (PAIS). Indices of psychosocial and social functioning from the instrument include assessment of health care orientation, vocational functioning (work or home activities), domestic environment, sexual functioning, marital relationship, extended family relationships, recreational functioning, and psychological distress. Depression levels were assessed using the Center for Epidemiologic Studies Depression Scale and anxiety states were measured using the Speilberger State and Trait Anxiety tool.

Findings indicated significant psychological distress for spouses in levels of depression, state anxiety, and impaired social functioning during the time prior to surgery. Also impaired, although to a lesser extent, were levels of vocational, domestic, and sex-

ual functioning. Extended family appeared not to be affected by the stress of waiting for surgery (Langeluddecke et al., 1989).

Twelve months after surgery, spouses were found to have significant improvement in depression, state anxiety, and overall PAIS scores compared to levels prior to surgery. No significant improvement was seen in attitudes towards health care, domestic functioning, sexual functioning, or involvement in family activities (Langeluddecke et al., 1989).

Findings of the study by Langeluddecke et al. (1989) support the stressful nature of cardiac surgery for spouses of patients and suggest that adaptation to the stressful event may be prolonged. The limitations of this study are similar to those of other studies. Small sample sizes and homogenous sample characteristics limit generalizability. Findings indicated that extended family appeared not to be affected by the stress of waiting for surgery; however, it is unclear to whom the term extended family referred to or how this was determined. Psychosocial and social functioning were assessed prior to surgery and 12 months later. It is unknown if psychosocial and social functioning were at their "lowest point" prior to surgery. Questions remain regarding levels of psychosocial and social functioning in the early recovery period. While improvement was significant in some areas 12 months later, more information is needed regarding when this improvement occurs and what strategies might hasten the improvement.

Postoperatively, the hospital environment becomes a source of stress for families. While the patient recovers in the hospital, family members continue to experience hardships and strains associated with the illness of a family member. While patients were in the ICU, spouses reacted with feelings of shock, relief, fear, and anxiety. The physical appearance of patients and the critical care environment contributed to the feelings of

shock experienced by spouses. The fear of the spouse's death continued. Many spouses described being afraid of the equipment. Other reactions during this time included feelings of being "in the way," being helpless, and being preoccupied with the mate (Cozac, 1988). Sources of stress included loss of control over hospital events, lack of privacy, lack of information, and concern regarding what to expect after discharge. Perceptions by family members of hospital staff rudeness, insensitivity to the feelings of family members, and impersonalization were additional problems (Artinian, 1989).

Alterations in family function and roles may occur as a result of the stressors experienced by families prior to discharge. Disruption in family life during the time between finding out surgery was needed until the actual surgery, worry about finances, distress on the part of the family member waiting for surgery, and a lack of intrafamily support illustrated some of the concerns of the family members regarding family relations (Artinian, 1989).

Hardships related to the cardiac surgery included added responsibilities for family members, increased demands on time, fatigue, and an increased number of phone calls. While some family members reported a general concern related to the surgery, it is interesting to note that many of the "difficulties" were unrelated to the surgery (e.g., finding a job, studying) (Artinian, 1989).

The added responsibilities and increased demands on time as a source of stress are consistent with the findings of other researchers. Gillis (1984) found that, postoperatively, spouses reported significantly higher levels of subjective stress than patients. Subjective stress was measured using the Impact of Event Scale, an instrument designed to assess individuals' subjective stress in relation to a particular event. In trying to identify the source of this difference, role (e.g., spouse or patient) was found to be the variable

that accounted for the differences in reported stress. The role of spouse was associated with significantly higher reports of stress than the role of patient during the time of hospitalization (Gillis, 1984).

The literature indicates that the stress of CABGS begins when the patient and family first finds out that surgery is needed. Waiting has been identified as a significant stressor for families. Waiting for the day of surgery and waiting while the patient is in the operating room are particularly stressful situations for the family. The uncertainty about the outcome and what to expect after the surgery add to the strain of the situation.

Family responses to the stress of waiting for surgery and the immediate postoperative period also have been documented. Anxiety, fear, and depression have been found to be responses of family members to this experience. Studies have also indicated that the stress of the preoperative and immediate postoperative experiences may have a negative effect on family function. However, no study has examined how the cumulative effects of family stress from these experiences impacts the psychological well-being of patients during early recovery. Additionally, no study has examined the relationship between family adaptation and the postoperative emotional state of patients.

There are common limitations to these mostly descriptive, qualitative studies. Small sample sizes, convenience sampling methods, and homogenous samples limit generalizability. The majority of subjects were upper-middle class, Caucasian women, usually spouses of the patients. It is unknown whether families of CABGS patients today would identify the same sources of stress. In the previously discussed studies, patients were undergoing CABGS for the first time. Artinian (1989) provided no further description of patient characteristics. In the study by Gillis (1984), sixty-one of the patients were male with an average age of 59 years; the remaining 10 female patients had an aver-

age age of 63 years. No information is provided regarding the patient's general health status, although Gillis reports that the "majority had suffered from a previous myocardial infarction and had been symptomatic for several years before surgery" (p. 104). Many patients that undergo CABGS today are older, have comorbidities, and poorer general health status than patients undergoing CABGS when earlier studies were conducted.

While most of the studies reviewed have a stated purpose of studying "family," the focus has been on the spouse. As the population of patients undergoing CABGS increases in age, spouses may or may not be the nuclear family for patients. The hardships and strains created by role changes and responsibilities, as well as the effects of strains on family adaptation, vary depending on the family structure.

Many of these studies were conducted prior to the procedure becoming "common place" or prior to the advent of "fast-track" procedures that have led to early discharge for CABGS patients. Little information is known regarding how these changes in the procedure and discharge affect the stress associated with waiting or the uncertainty associated with the outcome. More information is needed to determine the role of patient variables such as PLOS, age, complications, and comorbidities on family stressors during the preoperative and immediate postoperative periods.

Family Demands After Discharge

The pile-up of stressors, referred to as family demands, continues even after the period of hospitalization. Factors contributing to family demands may include unresolved aspects of the stressor event, unmanaged hardships associated with the stressor event, and intrafamily changes precipitated by the stressor (McCubbin et al., 1996). With discharge,

families already experiencing stress and intrafamily changes must now incorporate caregiving activities.

Many of the hardships and strains encountered by families during early recovery center on the caregiving responsibilities. One of the most frequently identified sources of stress for families related to the caregiving role is the "monitoring" of the patient. Gillis and Belza (1992) described four types of caregiving activities after cardiac surgery: functional, monitoring, comfort, and support. This classification of caregiver work was derived from analysis of data obtained during telephone calls to family caregivers at one, 2, 3, 4, 6, and 8 weeks after discharge. The majority of family caregivers were spouses. Other caregivers participating in the study included children, a sibling, and significant others (Gillis & Belza).

In the first week after discharge, the priority for families was management of the illness. Activities were related to comfort and monitoring work. Concerns regarding how to care for patients, worry about physical conditions, and responsibilities of caring for patients at home were described as sources of stress for families (Gillis & Belza, 1992). Additional comfort and monitoring responsibilities identified by families during the early recovery period included anticipating needs and assisting with pain management, diet, and medications, as well as other patient monitoring activities (Artinian, 1991; Gillis, 1984; Gillis, Neuhaus, & Hauck, 1990; Gortner et al., 1988; Stanley & Frantz, 1988; Yates & Booton-Hiser, 1992).

Managing everyday life was the focus of families beginning the second week after discharge. In addition to monitoring work, functional work became more prominent. Functional work included activities such as shopping, meal preparation, housework, and

yardwork. Caregiver problems identified during this time included feeling overwhelmed with responsibilities and a wish to protect the patient (Gillis & Belza, 1992).

Gillis and Belza (1992) described an increase in support work for families beginning in the third week after discharge. Support work involved providing encouragement and empathy, as well as tending to the psychological needs of patients. Caregiver problems included a fear of the patient's death and anger over patient noncompliance. The focus on monitoring and functional work continued through the recovery period.

From interviews with participants, Gillis and Belza (1992) identified positive and negative consequences of caregiving activities on families. An increased closeness between patients and spouses was a positive consequence. Negative consequences included patients becoming overly dependent upon spouses or spouses becoming overly protective of patients. During the first week after discharge, patients reported spouses were overprotective or overreactive. Spouses reported that patients ignored them and their concerns. By the second week, conflict was evident, and by the fourth week, estrangement was present within some of families.

During the early days after discharge, family members feel responsible for the well-being of patient (Artinian & Duggan, 1993; Dickerson, 1998; Gillis, 1984; Stanley & Frantz, 1988). At times, the desire of families to protect the patient can lead to conflict between patients and families regarding the recovery regimen. If the monitoring work of family members is perceived as overprotectiveness by patients, conflict becomes an additional stressor (Gillis, 1984; Artinian & Duggan, 1993).

The findings of Gillis and Belza (1992) indicate that hardships and strains associated with the recovery of CABGS patients change over time. Artinian and Duggan (1993) had similar findings in a study to identify the concerns and demands of spouses related to

the recovery of mates from cardiac surgery. Using a longitudinal descriptive panel design, Artinian and Dugan interviewed spouses of CABGS patients prior to discharge, and at one, 3, and 6 weeks following discharge. Data analyses were done using content analysis. For purposes of this study, concerns were defined as "something associated with their partner's (CABGS) that caused distress, worry, or anxiety" (p. 279). Demands were described as "situations that were difficult to handle" (Artinian & Duggan, p. 280).

One week after discharge, priority concerns were related to signs and symptoms of physical distress as well as the mood and morale of the mate. Symptoms of physical distress of patients remained the highest rated concern for spouses at weeks 3 and 6. Mood and morale, second highest concern at week one, was the least frequently mentioned concern at weeks 3 and 6. At week 3, adherence to the recovery regimen was the second highest concern (Artinian & Duggan, 1993). These findings support those of Gillis and Belza (1992) that monitoring and support work during the early recovery period are of concern and a source of stress for family caregivers.

Five themes related to spousal demands during recovery emerged from the data. Prior to discharge, the most frequent spousal demands were related to the surgery, hospitalization, and experiences with hospital personnel. Personal stress and family tension were the second-ranked demands prior to discharge, followed by the caregiving role, the physical condition of the partner, and mood and morale of the partner (Artinian & Duggan, 1993).

The priority of these demands changed throughout the recovery process. One week after discharge the top-ranked difficult-to-handle situation for spouse was personal stress and family tension. This demand was related to conflict between spouses and partners over recovering activities. The caregiving role was the second most frequently iden-

tified demand. Spouses expressed concern over the content of the caregiver role as well as the amount of work. Fatigue, confinement to the house, and other consequences of assuming the caregiver role were perceived as difficult to handle for many of the spouses. Three weeks after discharge, the most frequently mentioned demand for spouses was the mood and morale of their partner. While mood and morale had been an early "concern," by the third week after discharge it was no longer a concern but rather a demand that was difficult for spouses to handle (Artinian & Duggan, 1993).

Artinian and Duggan (1993) found that not all spouses experienced concerns or demands during the recovery of their partner and the percentage of those who did have concerns varied over time. During the time of hospitalization, 55% of spouses were able to identify concerns; this number decreased to 46.8% at week one, but increased to 51.4% at week 3. The same pattern was seen in the number of spouses identifying demands. During hospitalization, 56% of spouses identified specific demands. During the first week after discharge, 49.5% of spouses identified demands with an increase to 53.3% at week 3 (Artinian & Duggan). This pattern is similar to that of the incidence of emotional reactions experienced by CABGS patients (King & Parrinello, 1988; Moore, 1994). Identified concerns and demands decreased again at week 6, although a subject attrition rate of 39% at week 6 may be a contributing factor.

The demands of coping with patients' mood and morale described by Artinian and Duggan (1993) are frequently identified as stressors for families. The occurrence of depression, irritability, mood swings, and other emotional responses has been well documented in the literature (Burker, 1995; Moore, 1995; Rankin, 1992; Timberlake et al., 1997). Artinian (1991) described qualitative data illustrating spousal concern about the mental state of the patient. Spouses commented on the difficulty in coping with the hus-

band's irritability, mood swings, and depression. Sikorski (1985) and Miller and Wikoff (1989) identified the need to prepare spouses for managing the psychosocial needs of their partners. These findings support those of Gillis and Belza (1992) regarding the importance of the support activities of families during the early recovery.

Additionally, uncertainty is a frequently identified source of stress for families during the early period after discharge. Yates and Booton-Hiser (1992) assessed the similarities and differences between patient and spouse perception of stress. The most frequently identified source of stress was uncertainty surrounding if and when the illness would reoccur. Spouses found uncertainty to be a more significant source of stress than patients.

The patient population in the study by Yates and Booton-Hiser (1992) included male patients who had an MI or who had undergone either CABGS or a percutaneous transluminal coronary angioplasty. Fifty-five percent of patients participating in the study were newly diagnosed with coronary artery disease. The newness of the diagnosis may have contributed to the significance of uncertainty as a source of stress for both patients and spouses. The instrument used to identify stressors, Cardiac Recovery Stress Scale, was developed for the study. The investigators acknowledged several limitations with the instrument, including a lack of content validity and reliability data (Yates & Booton-Hiser).

Despite the limitations of the instrument, the findings of the significance of uncertainty as a source of stress are congruent with other studies. Artinian (1991) found that uncertainty about what to expect and about the future of the patient were significant areas of concern. Sikorski (1985) found that despite excellent or good knowledge of the physi-

cal discomforts of early convalescence, spouses still expressed uncertainty regarding the physical discomforts experienced by their partners.

Hardships and strains experienced by families of CABGS patients in the early discharge period are focused on caregiving responsibilities. In particular, perceived responsibilities surrounding the monitoring of the physical and emotional states of patients can create intrafamily strain. As recovery progresses into the second and third weeks following discharge, additional strains are encountered by families related to functional activities of managing day-to-day responsibilities. More information is needed regarding the influence of normative transitions and other patient and family characteristics on family adaptation and the psychological well-being of older CABGS patients.

Summary

The literature describes many sources of family stressors or demands associated with CABGS. The demands related to this stressor event begin prior to the surgery and continue throughout the hospitalization and early recovery at home. The most frequently identified sources of family stress include waiting, uncertainty, and managing the physical and emotional needs of the patient after discharge. These demands of the family can result in alterations in family functioning and in the well-being of individual family members.

Most of the studies examining family stressors associated with CABGS were done prior to the advent of new procedures in the care of CABGS patients that have shortened postoperative length of stay. In addition, these studies have focused on "uncomplicated" CABGS patients and their families. CABGS patients today are older and have more health problems. Older women are having CABGS more than previously.

Much of the information we have about family stressors and CABGS has been gleaned from studies of spouses of male patients; the family of a CABGS patient today may be different.

The studies reviewed here focused on illness-related stressors. The pile-up of family demands includes not only illness-related stressors, but stressors unrelated to the illness event. More knowledge is needed about the impact of normative transitions and other concurrent stressors that families must manage at the same time they are experiencing the demands created by the CABGS.

Family Adaptation

A stressor event such as CABGS may require families to alter established patterns of functioning in order to manage associated hardships and strains. Family adaptation has been described as the "outcome of family efforts to bring a new level of balance, harmony, and functioning to a family crisis situation" (McCubbin et al., 1996, p. 26). Family adaptation occurs along a continuum, from positive bonadjustment to negative maladjustment. Bonadjustment occurs when established patterns of family functioning are maintained despite the crisis event. With maladjustment, families are required to change established patterns of functioning in order to maintain family balance and harmony (McCubbin et al.). Family adaptation also refers to the "efforts by a family to realign its members as an integrated and functioning unit" (Bowen et al., 1997, p. 54) and incorporates the concepts of family organization, flexibility, cohesion, and communication (Rolland, 1994).

Family Adaptation and Pile-up of Demands

The pile-up of demands is hypothesized to negatively influence family adaptation. The accumulation of stressors can have a negative effect on the family unit as well as on individual family members. Multiple studies have documented the negative relationship between the pile-up of demands and family adaptation. In caregiving families of elderly patients (Fink, 1995), families of critically injured family members (Leske & Jiricka, 1998), families with technology- assisted infants in the home (Stephenson, 1999), families with children with autism or severe communication disorders (Bristol, 1987), and in "normal" families (Lavee, McCubbin, & Olson, 1987) the pile-up of demands has been found to have a negative impact on family adaptation.

The manner in which the pile-up of demands affects family adaptation is unclear. Intrafamily strain, a consequence of the pile-up of demands, has been found to have a direct relationship to family adaptation. Lavee et al. (1987) tested a model that sought to explain the consequences of an accumulation of normative transitions and stressful life events on adaptation. The model hypothesized that stressful life events and normative transitions would increase interpersonal and intrafamily conflicts and strains. The stressor events, transitions, and intrafamily strain were then hypothesized to negatively affect family adaptation. The model also predicted that marital adjustment and sense of coherence (e.g., appraisal of the family's coping capabilities) would intervene as mediators between the pile-up of demands and adaptation.

The study sample was part of a large national survey of 1,251 "normal" families. A stratified random sampling approach was used, with more than 100 families representing each of the seven stages of the family life-cycle. The FILE was used to assess normative and nonnormative family stressors and intrafamily strains. Marital adjustment was

measured using ENRICH, an instrument developed to assess the strengths and weaknesses of relationships, and sense of coherence was evaluated using the Family Crisis Oriented Personal Evaluation Scale, an instrument to identify family coping strategies. Family adaptation was defined as family well-being and was assessed using items from the Quality of Life scale. The items were chosen to reflect aspects of family life representing adaptational outcomes (Lavee et al., 1987).

Findings of the study indicated that family well-being was negatively affected by intrafamily strain. Stressful life events and transitions influenced the amount of family strain, accounting for approximately 7% of the variance of intrafamily strain. Intra-family strains were found to mediate the relationship between normative and non-normative life events and family well-being. The researchers also concluded that neither transitional changes nor stressful events such as losses and illness had a direct effect on perceived well-being; these stressors did, however, influence interpersonal tension and role strains, which were found to directly influence perceived family well-being. Additionally, stressful events such as death and serious illness were found to be less disruptive to family functioning and well-being than normative transitions. The researchers concluded that family strains, more than stressor events themselves, predicted a decrease in physical, psychological, and social well-being (Lavee et al., 1987).

Additional analysis found that marital adjustment was a mediating factor between intrafamily strain and family well-being. Further, a sense of coherence had a positive affect upon family well-being, acting as a buffer between intrafamily strains and family well-being, reducing the effects of intrafamily strains on family well-being (Lavee et al., 1987).

Although the study sample included families from all life stages, the sample was not representative of the general population. The sample was obtained through a large national organization of Lutheran families, under-representing families of other religious and ethnic backgrounds. The findings do, however, have implications for the patients and families coping with an event such as CABGS. Studies examining stressors of families of CABGS patients have focused on demands created by the event itself. The findings of Lavee et al. (1987) suggest that demands unrelated to CABGS may create more of a strain on family adaptation.

The significance of the relationship between family strains and family well-being has been described in other studies. In a study of caregiving families of elderly parents, Fink (1995) found that family life changes and the caregiver's appraisal of caregiving contributed significantly to family strains. Unlike the findings of Lavee et al. (1987), however, family strains were not significantly related to family well-being (1995).

Fink (1995) predicted that family demands would have a positive, direct effect on family strains and an indirect, negative effect on family well-being. Family demands were defined as "stimuli or stressors that require a response from the family" (p. 140) and included family changes, amount of help to the elder, and caregiver appraisal. The Family Strains Index, a self-report instrument that evaluates developmental and situational changes experienced by families during the past year, was used to measure family changes. The amount of help to the elder was assessed via a structured interview with the caregiver. Caregiver appraisal was assessed using the Zarit Burden Scale, a 22-item measure of caregiver perception of adverse financial, social, emotional, and physical consequences as a result of caregiving activities. Further, family resources, including economic, social support, and family internal system resources, were predicted to have a

negative effect on family strains and a positive effect on family well-being. The Family Social Support Index was used to measure social support and the Family Hardiness Index assessed internal family system resources (Fink, 1995).

Family strains, measured by the Family Strains Index, were defined as a "condition of felt tension or difficulty" (Fink, 1995, p. 140). Family well-being was defined as "the members' satisfaction with the functioning of the family unit, their perception of their own health and emotional well-being, and their perception of the family's health" (p. 140). Family well-being was measured by combining the scores of the caregiver and elder on four measures: Family Apgar, Bradburn Affect Balance Scale, perceived individual health, and perceived family health. The Family Apgar assessed family satisfaction with family life. The Bradburn Affect Balance Scale is a measure of feelings of positive and negative affect. Perceived individual health and perceived family health were measured using a single item whereby the family caregiver and care-recipient rated their individual and family health as excellent, good, fair, or poor (Fink).

The sample in the study by Fink (1995) was comprised of 65 families of at least two adults, excluding the care recipient. The care recipient was at least 60 years of age and a parent of one of the adults in the family. Data on caregiving involvement and caregiving appraisal were collected via a telephone interview. The instruments for social support, life events, family well-being, internal system resources, and family strain were mailed to the participants for completion by both the family caregiver and care recipient (Fink, 1995).

All of the family resources assessed in the study, economic, social support, and internal family resources, were found to be significantly and positively associated with family well-being. No significant relationship was found between any of the family re-

sources and family strains. Of the three components of family demands assessed in the study, family life changes and caregiver appraisal were significantly and directly related to family strains. The amount of help to the elder, that is, the total amount of care the family was providing, was not related to family strains. The hypothesis related to the indirect effects of family demands on family well-being was not supported (Fink, 1995). This lack of a relationship may have been due to families having adequate resources to manage the demands. The significant relationship between family life changes and family strains supports the findings of Lavee et al. (1987) that normative transitions have a significant impact on family adaptation.

The negative relationship between prior family stressors, strains, and transitions and family outcomes also was supported by findings in a study by Leske and Jiricka (1998) examining the impact of family demands and family strengths and capabilities on family adaptation after critical injury. For purposes of the study, family demands were defined as prior stressors, strains, and transitions as measured by the FILE. Injury severity also was identified as a family demand and was assessed using APACHE III scores. The APACHE III uses various physiologic parameters to determine a severity score. Scores greater than 100 are predictive of poor prognosis (Leske & Jiricka).

Four different instruments were used to assess family strengths and capabilities. The Family Hardiness Index was used to assess family hardiness. Family Inventory of Resources for Management measured family resources, and the Family Crisis Oriented Personal Evaluation Scale assessed family coping. The Family Problem-solving Communication Index was the final measure of family strengths and capabilities. Family adaptation was operationalized using two instruments, the Family Well-being Index and the

Family Adaptation Scale. Reliability coefficients for all instruments were good, ranging from .72 to .98 (Leske & Jiricka, 1998).

Data were collected from a convenience sample of 51 family members of 21 patients within the first 2 days after critical injury. Family members ranged in age from 18 to 61 years of age; 25% of family members were parents of patients, 24% were siblings of patients, 10% were spouses, 18% were children of patients, and 24% were classified as "other." Data were collected while the patient was in the hospital, approximately 2 days after the injury (Leske & Jiricka, 1998).

Findings of the study indicated that increases in prior family stressors, strains, and transitions, as indicated by FILE scores, were significantly related to decreases in hardiness, resources, problem-solving communication, family well-being, and family adaptation. A nonsignificant relationship was found between FILE scores and family coping. Positive, significant relationships were found between Family Adaptation Scores and family hardiness, resources, coping, problem-solving communication, and family well-being.

To determine the impact of family demands on family adaptation, hierarchical regression analysis was done. Family stressors, strains, and transitions accounted for 40% of the variance in family well-being. The addition of family strengths and capabilities to the regression model accounted for an additional 5% of the variance in family well-being, a nonsignificant change. Despite the correlations among family strengths and capabilities and family well-being, family strengths and capabilities did not contribute significantly to the overall variance in family well-being. Prior stressors, strains, and transitions were the only variables in the regression equation that contributed significantly to the overall variance in family well-being (Leske & Jiricka, 1998).

Prior stressors, strains, and transitions accounted for 16% of the variance in family adaptation. Unlike family well-being, family strengths and capabilities were found to account for 44% of the variance in family adaptation, a significant change. Further analysis indicated that problem-solving communication was the only family strength and capability variable to significantly contribute to the overall variance (Leske & Jiricka, 1998).

The timing of data collection was a limitation to the generalizability of findings. Data were collected soon after the injury. The impact of the serious injury on family demands and strains was, therefore, limited to that one period of time. The course of hospitalization, the length of stay, and other illness-related factors may yet contribute to the pile-up of demands. Findings regarding the effects on family adaptation may be different if data were collected at a different time.

Further, there was no consistency in terms of which family member provided data; in some cases, multiple family members for the same patient completed the instruments. Data was collected as individual-level data even though one or more family members for the same patient may have participated. Findings were, therefore, based on the perception of the individual family members who chose to participate in the study.

An additional concern related to the methodology of this study is the measurement of family well-being and family adaptation as two different variables. Since family well-being is frequently used as a measure of family adaptation, it is not unexpected that these two variables were highly correlated. Findings suggested that increased family demands were a significant contributor to decreases in family well-being; however, these demands were not reduced by family strengths and capabilities. While the same relationship exists between family demands and family adaptation, family strengths and capabilities appeared to reduce the impact of increased demands on family adaptation (Leske &

Jiricka, 1998). The different aspects of family adaptation assessed by the two instruments may account for the difference in findings.

The studies by Lavee et al. (1987), Fink (1995), and Leske and Jiracka (1998) all sought to evaluate relationships between variables identified in the Double ABCX model. Despite methodological differences, including different populations, different time periods for data collection, and the use of different measures to assess family adaptation, the findings of all three studies suggest that the pile-up of demands has a negative effect on family adaptation. Furthermore, the impact of nonnormative changes such as a serious illness may be less disruptive to families than normative life changes and intrafamily strains.

Family Functioning

According to the Double ABCX, in the presence of bonadjustment, patterns of family functioning are maintained despite the demands placed on families during a crisis event. Demands exceeding the capabilities of families to cope with a crisis event result in alterations in processes of family functioning such as communication, adaptability, cohesion, and organization (McCubbin, Thompson et al., 1996). An adaptive outcome related to changes in family functioning is the family's satisfaction with family functioning.

The literature suggests that satisfaction with family function declines over time during the recovery of a CABGS patient. Additionally, family function appears to vary between patients and spouses. Gillis et al. (1990) conducted a randomized clinical trial of a nursing intervention intended to improve family functioning. The investigators hypothesized that a specific nursing intervention would increase family resources and thus positively influence family functioning. Participants in the study were first-time CABGS

patients and their spouses. The 67 patient and spouse pairs were randomly assigned to either the experimental or control group. The experimental group received additional discharge teaching as well as follow-up phone calls each week for 4 weeks and then at weeks 6 and 8.

The Family Apgar was used to assess family functioning. The Family Apgar assesses family member's satisfaction with five specific areas of family life: adaptability, partnership, growth, affection, and resolve. Each spouse and patient completed the instrument prior to surgery and at 3 months and 6 months after discharge. The Marital Adjustment Scale was completed at baseline and at 6 months. The Marital Adjustment Scale is a measure of marital adjustment that addresses marital conformity in decision-making. In addition, the Family Inventory of Resources for Management also was administered prior to surgery and at 3 and 6 months after discharge. The Family Inventory of Resources for Management was adapted for this study to measure family variables of esteem and communication, mastery and health, social support, and social desirability. Reliability for all instruments was .73 to .90 (Gillis et al., 1990).

No significant treatment effects were found for measures of family functioning; however, a significant effect for time was found. Family APGAR scores decreased significantly between scores prior to surgery and at 3 months for patients and spouses in both the control and treatment groups. No significant main effects for the treatment group were detected for marital adjustment or in resources. Patient scores reflecting marital adjustment increased from the point when they were assessed prior to surgery and at 6 months; however, marital adjustment scores decreased for spouses over time, suggesting that recovery from CABGS differs for patients and spouses (Gillis et al., 1990).

For patients in the control group, Family Inventory of Resources for Management scores consistently increased over time; scores for the spouses in the control group decreased. In the treatment group patient scores increased between baseline and 3 months; scores for the spouse decreased between baseline and 3 months but increased again at 6 months (Gillis et al., 1990). This decrease in scores over time for spouses may be a consequence of having to rely on coping skills to manage during this time of recovery.

The variability in the findings related to the three measures of family functioning (Family Apgar, Marital Adjustment Scale, and Family Inventory of Resources for Managment) may be an illustration of the difficulty in measuring the concept of family adaptation without a clear definition. The instruments used for this study measure very different aspects of family adaptation. Correlations between the three instruments were not reported.

Another difficulty in measuring family adaptation is using individual perceptions of family adaptation. While differences between the patient and spouse perception of family functioning were found, these differences were based on individual perception, and did not indicate a property of the family as a whole.

Despite the measurement difficulties, the findings of Gillis et al. (1990) suggest that changes in family functioning may occur early in the recovery period, prior to the first 3 months. The significant decrease in family functioning at 3 months may be a reflection of inflated baseline scores, as the baseline data were collected prior to surgery when family cohesiveness may be increased. However, the decrease in family functioning is consistent with the findings of Artinian (1991), who found that spouses had significantly lower levels of marital quality 6 weeks after their partner's surgery compared to baseline levels determined during hospitalization. Comparisons of findings need to be

made cautiously as different outcome measures were used. While Gillis et al. (1990) used the Family Apgar, Artinian (1991) used the Dyadic Adjustment Scale to measure marital quality. Findings by Artinian are limited by the fact that preoperative levels of marital quality were unknown.

The findings of Gillis et al. (1990) and Artinian (1991) differ from those of Hilbert (1996), who found no differences in Family Apgar scores for either patients or spouses over time. The purpose of this descriptive, longitudinal study was to determine if there was a difference in perceived satisfaction with family functioning and affect of MI patients and spouses between the time of hospitalization and 3 months after discharge. A secondary purpose was to determine if there was a relationship between satisfaction with family functioning and affect of MI patients and spouses during hospitalization and 3 months later.

Forty-two couples participated in the study. The majority of the patients were male, with an average age of 56 years. Perceptions of family functioning were assessed using the Family APGAR. Patient and spouse affect were measured using the Affective Balance Index. The Affective Balance Index measures both positive and negative affective states. Data initially were collected from both the patient and spouse prior to discharge from the hospital. The second data collection at 3 months was done via mail (Hilbert, 1996).

Findings of the study indicate no difference in perceived satisfaction of family function for patients or spouses between hospitalization and 3 months later. However, results indicated a significant correlation between perceived family functioning and affect balance for patients at time of hospitalization and for spouses both at time of hospitalization and 3 months later. Patients and spouses were found to have low positive affect

scores and high negative affect scores at time of hospitalization and 3 months after discharge (Hilbert, 1996). Findings are limited by the nonprobability sample. If and how results would differ in patients and spouses who chose not to participate is unknown. The results of this study, however, support those of others (Artinian, 1991; Rankin, 1992; Saunders, 1999) that indicate the negative emotional impact of illness on patients and spouses.

Carruth, Tate, Moffett, and Hill (1997) further explored the relationship between satisfaction with family functioning and the emotional state of family members. The purpose of their study was to test the extent to which family functioning was associated with reciprocity, emotional well-being, and family satisfaction and the extent to which positive and negative received exchanges are associated with family functioning, reciprocity, emotional well-being, and family satisfaction. The model proposed that positive received exchanges would positively influence family functioning. Family functioning was hypothesized to have a positive relationship to warmth and reward, intrinsic rewards, love and affection, family balance, and positive affect; these in turn, would positively impact family satisfaction (Carruth et al.).

For purposes of this study, family functioning was defined as adaptability and cohesion, as measured by the FACES II. The Family Satisfaction Scale was used to measure family satisfaction with adaptability and cohesion. The sample for the study was comprised of caregivers of elderly parents or in-laws. The parent or in-law was at least 65 years of age and required assistance at least three times a week (Carruth et al., 1997).

The findings of the study support the proposed model that family satisfaction was directly and indirectly influenced by reciprocity, emotional well-being, and family functioning. The results indicated that family satisfaction is directly influenced by the emo-

tional state of the caregiver and by the ability to derive intrinsic rewards from caregiving activities. In addition, results supported a hypothesis that emotional well-being is influenced by family functioning and that positive affect is directly linked to family functioning. All types of reciprocity other than warmth and regard where found to be directly and significantly associated with family functioning (Carruth et al., 1997).

In addition to family satisfaction, family adaptability and cohesion have also been used as outcome variables assessing family adaptation. In a study examining the affects of family coping behaviors, psychological distress, social support, and patient behavioral problems on family functioning in families in which a member has schizophrenia, Saunders (1999) found that higher family functioning was associated with more family coping, social support, and less psychological distress. Sowell et al. (1997) found that, in women with HIV, less family cohesion was positively correlated with increased anxiety in patients. Moneyham, Sowell, Seals, and Demi (2000) found a significant negative relationship between family cohesion and depression in women with HIV.

Using the Double ABCX model as a conceptual framework, Saunders (1999) conducted a correlational study to examine the relationship between family coping behaviors, family psychological distress, family social support, patient behavioral problems, and family functioning in families who were caring for a family member with schizophrenia. The Family Crisis Oriented Personal Evaluation Scale was used to assess family coping. Family social support was measured using the Personal Resource Questionnaire, and the Brief Symptom Inventory assessed family psychological distress. Patient behavioral problems were measured using the Client Behavioral Problems Scale. Family functioning was measured using the FACES II. Alpha reliability coefficients for the scales used in the study ranged from .70 to .97 (Saunders).

A convenience sample of 58 primary family caregivers participated in the study. Respondents ranged in age from 32 to 83 years old. The majority were Caucasian females, who were married, college educated, and not working. The length of time the family member had been caring for a patient with schizophrenia was 0 to 57 years with a mean of 17.7 years (Saunders, 1999).

Descriptive analyses found that mean scores for family functioning (e.g., FACES II), were somewhat lower compared to norms, indicating less cohesion and adaptability. The mean score on the Family Crisis Oriented Personal Evaluation Scale, an indicator of family coping, suggested more use of coping behaviors in this population. Scores on the Brief Symptom Inventory, an assessment of psychological distress, indicated low to moderate amounts of distress in families participating in the study. Additionally, evaluation of family social support scores revealed that participants in the study had a fairly high perception of social support (Saunders, 1999).

Correlational analysis found a significant negative relationship between family functioning and psychological distress and patient behavioral problems. A significant positive relationship was found between family functioning and social support. These findings suggest that family psychological distress and patient behavioral problems may create more demands on the family, resulting in changes in normal patterns of functioning (Saunders, 1999).

Generalizability of findings is limited by the convenience sample and data collection methods. Self-selection of study participants may have affected study findings. Study instruments were given to participants in a packet for them to complete independently, therefore, outside influences may have resulted in response biases. The instruments used for data collection have limited reliability and validity for this population. Furthermore,

the use of individual-level data in assessing family parameters may have biased the findings. Finally, results could have been affected by the fact that many of the family members had been managing the illness for a long period of time.

In a longitudinal study Sowell et al. (1997) conducted a series of five interviews examining the social and psychological factors affecting quality of life in HIV-infected women. Two hundred and sixty four HIV-infected women from eight public health clinics participated in the study. Quality of life variables measured as part of the study included daily functioning, general anxiety, and HIV-associated symptoms. Five items from the SF-36 were used to assess daily functioning, the General Anxiety Subscale of the Brief Symptom Inventory was used to assess general anxiety, and HIV-associated symptoms were measured by a list of 18 HIV-related problems. Data also were collected on social factors, including social support, material resources, disclosure, and family functioning. Social support, material resources, and disclosure were measured using an instrument specifically developed for the study. Four psychological factors also were assessed: stigma, emotional distress, intrusive thoughts, and fatalism. Stigma, emotional distress, and fatalism were assessed from items developed specifically for this study. Intrusive thoughts were measured using the Impact of Events Scale. Family functioning was measured using the FACES II. Factor analysis identified two subscales, cohesive family and detached family. Patients completing the FACES II were asked to rate their family, using their own definition of family (Sowell et al.).

Correlational studies indicated that all psychological factors except for avoidance (one aspect of intrusive thoughts) were positively correlated with all three measures of quality of life. Avoidance was positively related to general anxiety but not to the other two measures of quality of life. Of the measures of social factors, social support and dis-

closure were found to be unrelated to any of the three measures of quality of life. Family cohesion, a measure of family functioning, was negatively associated with general anxiety and symptoms, indicating that patients with higher family cohesion had less general anxiety and fewer reports of HIV-related symptoms. Another dimension of family functioning, detached family, was found to have a positive association with general anxiety, indicating that patients with a detached mode of family functioning experienced more general anxiety. Material resources were found to be negatively associated with HIV-related symptoms (Sowell et al., 1997).

In a secondary analysis of the same study, Moneyham et al. (2000) examined the relationship between personal resources, environmental resources, coping resources, and HIV-related stressors and depressive symptoms in African American women with HIV. The sample was comprised of primarily single, African-American women residing in urban areas. Seventy-three percent had an income of less than $10,000.

Personal resources were identified as self-esteem and mastery. Rosenberg's Self-Esteem Scale was used to assess self-esteem. Mastery was assessed using a 7-item scale reflecting an individual's belief about his or her ability to manage difficult life situations. Environmental resources included tangible resources, social support, and family cohesion. Tangible resources and social support were measured using an instrument developed by the investigators to better reflect the study population. The cohesion subscale of the FACES II was used to measure family cohesion. An instrument developed for the study was used to assess coping resources. The depression subscale of the Brief Symptom Inventory was used to measure depressive symptoms (Moneyham et al., 2000).

No significant differences in depressive symptoms were found among each category of demographic variables, including age, marital status, income, employment status,

education, residence (e.g., urban or non-urban area) or stage of disease (e.g., asymptomatic, symptomatic, AIDS). Correlations between depressive symptoms and the study variables indicated that neither of the personal resources were significantly associated with depressive symptoms. A significant negative correlation was found, however, between family cohesion and depressive symptoms, indicating that patients with lower family cohesion had more symptoms of depression. No other environmental resources were found to be significantly related to depressive symptoms. Spiritual activities and managing the illness were coping responses found to have a significant negative correlation with depressive symptoms. All measures of HIV-related stressors, including functional impairment, self-rated health, quality of life, HIV symptoms, and work performance impairment were found to have a significant negative correlation with depression (Moneyham et al., 2000). While the findings are limited by the sample characteristics, the results do suggest a relationship between family adaptation and psychological well-being.

Not all studies have supported the relationship between family adaptation and psychological well-being. Drory and Florian (1991) studied 128 men to determine factors that affect long-term psychosocial adjustment to coronary artery disease. Psychosocial adjustment was assessed using the PAIS. The PAIS is a self-report instrument that examines seven domains of psychosocial adjustment: vocational environment, sexual relationships, domestic environment, health care orientation, social environment, psychological distress, and extended family relationships. Other study variables included two measures of personality: hardiness, assessed using the Hardiness Scale, and Type A personality, assessed using the Jenkins Activity Survey. Family adaptability and cohesion were assessed using the FACES II (Drory & Florian).

Data were collected from male patients participating in a cardiac rehabilitation program who had a history of heart disease. The length of time from diagnosis to time of study participation ranged from 1 to 25 years. The majority of participants (82%) had a history of MI, 6% had a history of CABGS, and 13% had a history of angina. The average age of study participants was 56 years (Drory & Florian, 1991).

An analysis of the relationship among the study variables found that family adaptability and cohesion were unrelated to psychosocial adjustment. Similarly, Type A behavior, illness duration, physical work capacity, and demographic variables were found to be unrelated to psychosocial adjustment. Of the variables examined, hardiness was the only variable found to have a significant, positive relationship to all domains of psychosocial adjustment with the exception of sexual relationships. The strongest relationship was found between hardiness and psychological distress (Drory & Florian, 1991).

Evaluation of the PAIS scores found that patients participating in the study had low scores on all domains of the PAIS, indicating good psychosocial adjustment. The lack of variability in PAIS scores may be a factor in the lack of significance found between family adaptability and cohesion and psychosocial adjustment. Additionally, the focus of the study was on long-term psychosocial adjustment, including the domain of psychological distress. Conclusions can't be made as to the relationship between family adaptability and cohesion and psychological distress during the time when patients and families are managing more recent family demands.

The literature supported the hypothesis that family adaptation is negatively affected by the pile-up of demands. While nonnormative stressors, namely the illness of a family member, contribute to the pile-up of demands, stressors unrelated to illness, such as normative changes and intrafamily strain, have also been found to significantly impact

family adaptation. The research examining stressors of CABGS patients and families has focused on demands related to the CABGS. Further understanding is needed of the effects of other types of life changes on family adaptation following CABGS.

The studies reviewed also indicated that family adaptation, specifically cohesion and adaptability, may affect the psychological well-being of patients with chronic illness. How this relationship differs in the presence of an acute event such as CABGS is unknown.

Any conclusions drawn from the research on family adaptation have to be made with caution. The complexity of conceptually and operationally defining the concept is evident in the literature with the many instruments that have been used to measure family adaptation. Because of these variations, making comparisons and drawing conclusions across the research studies is difficult.

Summary

The review of literature summarized in Chapter 2 focused on the early discharge of cardiac surgery patients, the psychological well-being of CABGS patients during early recovery, the pile-up of family demands, and family adaptation. Findings of previous research were summarized and limitations were identified.

The demographics of the CABGS patient population is changing with increasing older patients with more comorbidities undergoing surgery. Despite the changing demographics of patients, PLOS continues to decrease, with much of patient recovery occurring at home.

The review of literature indicates that alterations in psychological well-being during recovery are frequently of concern for both CABGS patients and families. Similarly

to studies describing illness-related family stressors, findings of published studies suggest that the pile-up of family demands also may include family stressors unrelated to the illness event. The pile-up of family demands may negatively affect family adaptation. Previous research provides conflicting information about the relationship between family adaptation and psychological well-being of patients with chronic illness. Additionally, no studies were found in the literature that examined the relationships among family stress, family adaptation, and psychological well-being of elderly CABGS patients.

CHAPTER 3

METHODOLOGY

The purpose of the study was to describe the relationship between the pile-up of family demands, family adaptation, and the psychological well-being of elderly CABGS patients 3 weeks after discharge. The following chapter describes the methodology that was used to implement this study. The methodology section includes study design, study setting, subjects, instrumentation, procedures, protection of human subjects, data analysis methods, and study limitations. A description and analysis of a pilot study conducted to evaluate methodological procedures is included at the end of Chapter 3.

Study Design

A descriptive correlational design was conducted to examine relationships among the study variables. The study variables were the pile-up of demands, family adaptation, and the psychological well-being of the patient.

Setting

The settings for the study were two institutions in a major metropolitan area in the southeast. The first site (Agency 1) was a 500-bed, not-for-profit, tertiary-care facility. The facility had four dedicated operating rooms for cardiovascular surgery procedures. In 2003, 973 isolated CABGS procedures were performed, 74.6% on males and 25.4% on females. Of the total number of CABGS performed, 533 were done on patients 61 years

of age or older. The majority of the patients were Caucasian (85.9%), with the next most frequent ethnic background being African American (11%). The second facility (Agency 2) was a 583-bed acute care teaching facility. During 2001, 948 patients had isolated CABGS. Of that number, 398 were 65 years of age or older. Seventy-two percent of patients were male and 78% were Caucasian.

Ethnic differences evident in the demographics from both facilities are consistent with national statistics of racial differences for this procedure. Gillum (1987) found that CABGS in Caucasians was performed 3.6 times more often than in African Americans. Wenneker and Epstein (1989) reported that the incidence of CABGS was 126% higher for Caucasians than for African Americans. Similarly, Goldberg, Hartz, Jacobsen, Krakauer, and Rimm (1992) found that national rates for CABGS were 76 versus 271 per 100,000 for African Americans and Caucasians, respectively. This disparity is greatest in the southeast (Goldberg et al., 1992).

Procedures

Sample Selection and Sample Size

The population for the study was CABGS patients who were 65 years of age and older. The sample for the study was selected through nonprobability convenience sampling of all patients undergoing CABGS during the study period of 11 months at the two data collection sites.

Inclusion criteria for potential subjects in the study included CABGS patients who a) were 65 years of age or older; b) underwent an elective, urgent, or emergent isolated CABGS for the first time; c) resided in a residential home prior to surgery; d) were discharged home; e) were oriented, and able to speak and understand English; f) could iden-

tify at least one living family member; g) were accessible via telephone; and h) were able to hear and communicate by telephone. Patient gender, ethnicity, and the type of CABGS procedure (e.g., on or off cardiopulmonary bypass) did not restrict eligibility.

Criteria for exclusion included CABGS patients who a) underwent concurrent procedures such as valve replacement; b) experienced neurological postoperative complications, including cerebral vascular accidents; c) had a postoperative hospital length of stay of more than 14 days; d) had an altered mental status at time of discharge; e) were inaccessible via telephone; f) were unable to hear or communicate by telephone; or g) were readmitted to the hospital within 14 days of discharge.

The exclusion criteria were identified from the literature as factors that have the potential for complicating the recovery process. Concurrent procedures may prolong the postoperative length of stay and alter the recovery process (Johnson & McMahan, 1997; Nickerson et al., 1999). A postoperative length of stay greater than 14 days is considered indicative of a more complicated course of recovery (Cowper et al., 1997; Deaton et al., 1998). Neurological postoperative complications and altered mental status at time of discharge may have impeded the ability of the subjects to complete the study instruments.

The estimated sample size projected for the study was 60. This number was based on an alpha of 0.05, power of .85, R^2 .50, and five independent variables. An alpha of 0.05 and a power of .80 or more are generally accepted levels when considering Type I error (Cohen, 1988; Miles & Shevlin, 2001; Newton & Rudestam, 1999). An estimated squared population multiple correlation of 0.50 is a reasonable estimate for social science research (Stephens, 1996). The sample size was overestimated by 10% to allow for attrition. Data collection was terminated at a sample size of 42, as it was determined that data results would be unchanged even with the larger sample.

Hypotheses

Four hypotheses were tested for this study at the .05 alpha level. This alpha level was selected to minimize Type I error. The null hypotheses were:

1. There is no relationship between a pile-up of family demands and family adaptation.
2. There is no relationship between family adaptation and patient psychological well-being.
3. There is no relationship between a pile-up of family demands and patient psychological well-being.
4. When controlling for clinical risk and bodily pain, family adaptation has no mediating effect between the pile-up of demands and patient psychological well-being.

Instrumentation

Three instruments, the FILE, FACES II, and the MHI-5, a component scale of the SF-36 Health Survey, were identified for measuring the primary study variables. The instruments were chosen with consideration of their purpose, relationship to the conceptual model for this study, and their psychometric properties. Additionally, a demographic profile, a measure of bodily pain, and a tool to determine clinical risk were used. Copies of all data collection instruments are found in Appendix A.

Family Inventory of Life Events (FILE)

Purpose and Description. The accumulation, or pile-up, of family demands and strains was measured using the FILE (Appendix A) developed by McCubbin, Patterson,

and Wilson (1983). The purpose of the FILE is to assess the occurrence of family life stressors that have affected any member of a family unit during the preceding 12 months. Changes affecting any member of a family unit are considered to have some impact on other family members (McCubbin et al., 1996).

The current FILE with 71 items has nine subscales reflecting both normative (e.g., events related to normal developmental changes in a family) and nonnormative life events (e.g., illness). The subscales are intrafamily strains, marital strains, pregnancy and childbearing strains, finance and business strains, work-family transitions and strains, illness and family "care" strains, losses, transitions "in and out," and legal strains. The intra-family strains subscale consists of 17 items reflecting sources of tension and conflict between family members along with items related to parenting strains. Four items assess stressors related to the marital role due to sexual or separation issues. Pregnancy and childbearing strains measure not only stressors related to pregnancy but also family strains created by adding a new member to the family (McCubbin et al., 1983).

The FILE finance and business subscale is comprised of two dimensions: family finances and family business. The dimension related to family finances examines sources of increased strain on the money supply of a family; family business items reflect strain resulting from a family-owned business or from investments. Work-family transitions assess strains created by moving in or out of the work force and changes occurring at work or moves made by the family or one of its members. The legal subscale addresses strains created by a family member breaking laws or mores (McCubbin et al., 1983).

Illness and family care strains has three dimensions: illness onset and childcare, chronic illness strains, and dependency strains. Illness onset and childcare items reflect dependency needs arising from the injury or illness of a family member or problems with

childcare. Items addressing chronic illness strains are related to the onset of or increased difficulty with chronic illness. Items measuring dependency strains reflect the strain resulting from a member requiring more help or care (McCubbin et al., 1983).

The final two subscales address family strains created by losses and transitions "in and out." Six items in the losses subscale assess strains due to the death of a family member or friend and due to broken relationships. Transitions "in and out" reflect the movement of a family member into or out of the home or beginning a major involvement outside of the family (McCubbin et al., 1983).

The FILE has been used in multiple studies reflecting numerous ethnic populations. Studies of families experiencing a variety of acute and chronic illnesses, including CABGS, have also used the FILE to measure family strains. Normative data are available for all seven family life stages. The normative data are based on 980 couples representing all life stages. The FILE can be administered orally or in a written format and takes approximately 10 mins to complete.

Relationship to Conceptual Model. Individual and family stress theory provided the conceptual framework for the development of the tool. The FILE is based on the concept of the pile-up of stressors, a concept central to the Double ABCX model on which this study is based. Pile-up is the sum of normative and nonnormative stressors and intrafamily strains and is thought to be a possible explanation for why some families may be unable to cope with a single stressor event or crisis. As family stressors accumulate, the resources of a family to cope with the consequences of the demands created by the stressors may become overtaxed. Additional stressors may then lead to negative consequences for the family system and/ or individual family members (McCubbin et al.,

1983). For purposes of this study, the FILE was used as an assessment of the various normative and nonnormative family stressors that CABGS patients may be coping with during recovery.

Psychometric Properties. Reliability of the FILE is well established. The developers of the FILE reported an internal consistency, using Cronbach's alpha, of .81 for the FILE total scale score, with subscale reliability scores ranging from .73 to .30. The wide variance in frequency with which the family life events occur may account for the range of reliability scores. The developers of the FILE recommended using the total scale score due to the wide variance in reliability of the subscales (McCubbin et al., 1983). Reliability coefficients of published studies using the FILE range from .72 to .89, with the most frequent scores being between .80 and .83 (McCubbin et al., 1996). Test-retest reliability, an assessment of instrument reliability, was determined using Pearson's correlation. Test-retest reliability for the total scale is .80 at 4 to 5 weeks (McCubbin et al., 1983).

In studies of CABGS patients and their families, reliability coefficients of .86 and .82 have been reported (Artinian, 1991, 1992). No specific studies of elderly CABGS patients and their families that used the FILE were found in the literature; however, the FILE has been used with respondents ranging in age from 37 to 72 years (Artinian, 1992).

Construct and predictive validity of the FILE are documented. The initial FILE consisted of 171 items identified from inventories to assess individual life changes, as well as situational and developmental changes that occur across the life span. The identified family changes included both positive and negative changes, all of which necessitate adjustment on the part of the family. The 171 items were divided into eight categories:

family development, work, management, health, finances, social activity, law, and extended family relationships. The original 171 items were reduced to 71 items based on factor analysis using data from a sample of 322 families (McCubbin et al., 1996).

Factor analysis was used to group the 71 items of the FILE into the nine subscales. Developers of the FILE reported a wide variance in the frequency of the occurrence of the items. This wide variance affected the distribution of items, and thus the factor analysis. Because of this limitation, items that were conceptually appropriate but dropped from the factor analysis due to low frequencies were added to the final scale (Olson et al., 1992).

Validity was further established by discriminant analysis of low and high conflict families who had children with cerebral palsy and low and high conflict families who had children with myelomeningocele. As predicted, a significant difference in total life changes was found between families with low and high conflict in both groups; high conflict families with children with cerebral palsy and myelomeningocele experienced a significantly higher pile-up of life changes than families with low conflict (McCubbin et al., 1996).

Additional studies have assessed concurrent and predictive validity of the FILE. In one study, the pile-up of life changes, as measured by the FILE, was hypothesized to be negatively correlated with desirable dimensions of the Family Environmental Scale (FES), and positively correlated with undesirable dimensions of the FES. The FES is an instrument that is used to measure family functioning. The prediction was found to be true, with a significant negative correlation found between the FILE and the FES dimensions of cohesion, independence, and organization. A significant positive correlation, as

predicted, was found between the FILE and the FES dimension of conflict (McCubbin, et al., 1983).

Predictive validity was further assessed when the FILE subscales and total score were correlated with the health status of children with cystic fibrosis. Health status of the children was assessed 6 months and 9 months after measuring family life events and changes. Total life changes were found to be predictive of changes in pulmonary function in this population sample (McCubbin et al., 1983).

Administration and Scoring. The FILE is designed to be administered to one or both adult members of the family. Typically, the FILE has been used with parents, spouses, and adult children within a family. The instrument is easy to use, with respondents answering either yes or no for each of the 71 items as to whether or not the event has occurred in the family during the previous twelve months. A family life events score is computed from the number of yes responses from adult family members completing the tool. An adjusted score can be computed by using standard weights applied to each life event and strain. The standard weight indicates the relative magnitude and intensity of the event or strain. The readjusted score is determined by summing the standard weights for the "yes" items (McCubbin et al., 1996).

Permission to use the FILE for this study was given by McCubbin (Appendix B). For this study, the FILE was administered via telephone to the CABGS patient. The respondent was asked to indicate yes or no to each item as to whether it had occurred in their family during the previous 12 months. A family life events score was determined by summing the yes responses for each subscale. The subscale scores were then summed for

a total score. The total scale scores can range from zero to 71, with the higher score indicating an increased number of life events.

Additionally, a readjustment score using predetermined standardized weights was calculated. The readjustment score is determined by summing the standard weights for each yes item. The weights indicate the relative magnitude and intensity of the event (McCubbin et al., 1996). The readjustment score was used for descriptive purposes, for comparison with normative data, and for hypotheses testing.

FACES II

Purpose and Description. The FACES II (Appendix A) was used as a measure of family adaptation. Conceptually, the FACES II is based on three central dimensions of family functioning that the developers identified from family theory and family therapy: adaptability, cohesion, and communication. Adaptability refers to the flexibility of the family and their ability to change. Family adaptability is the ability of a family system to "change its power structure, role relationships, and relationship rules in response to situational and developmental stress" (Olson et al., 1992, p. 1). The concepts of family power, negotiation style, role relationships, and relationship rules are used to measure family adaptability. Family cohesion refers to the emotional connectedness or bonding of the family. Emotional bonding, boundaries, coalition, time, space, friends, decision-making, interests, and recreation are the concepts used to measure family cohesion. Family communication facilitates changes in adaptability and cohesion (Olson et al.).

The FACES II consists of 30 items, 16 reflecting family cohesion and 14 reflecting adaptability. Examples of items asked to the respondent include "Family members are supportive of each other during difficult times" and "In our family, everyone shares re-

sponsibilities." Family members complete the instrument by identifying on a scale of 1 (Almost Never) to 5 (Almost Always) how often the described behavior occurs in their family. Due to the age of the study population, two items, "Children have a say in their discipline" and "In solving problems, the children's suggestions are followed," were replaced with two items from the Faces II Couples version: "We are flexible in how we handle differences" and "We have a good balance of leadership in our family." This change was recommended by the authors (L. Knutson, personal communication, September 11, 2002).

Relationship to Conceptual Model. The Double ABCX conceptualizes family adaptation as an outcome of the family's efforts to maintain balance, harmony, and functioning when confronted by a crisis situation. Adaptation involves multiple components, including appraisal levels, resources, social support, coping, problem solving, and patterns of functioning (McCubbin et al., 1996).

Focusing on family functioning patterns as a component of family adaptation, FACES II addresses two aspects of family functioning: cohesion and adaptability. Families are conceptualized as being at one of four levels for both cohesion and adaptability. The four levels of family cohesion are disengaged (extremely low level of cohesion), separated, connected, and enmeshed (highest level of cohesion). The four levels of family adaptability are rigid (extremely low level of adaptability), structured, flexible, and chaotic (extremely high level of adaptability) (Olson et al., 1992).

The conceptual model for this study proposed that family adaptation was not only an outcome of family efforts, but also a mediating variable between a pile-up of family stressors and the psychological well-being of the patient following CABGS. It was hy-

pothesized that families with high levels of cohesion and adaptability would be better able to adapt to a pile-up of demands during a crisis event such as CABGS; likewise, families with low levels of cohesion and adaptability would have more difficulty in managing demands. As a mediating variable, high levels of cohesion and adaptability were proposed to mediate the impact of stress associated with the pile-up of demands on the psychological well-being of a family member recovering from CABGS.

Psychometric Properties. Originally, FACES II consisted of 90 items that addressed fifteen content areas of cohesion and adaptability, with six items per content area. A national survey (N = 2412) and a series of factor and reliability studies reduced the scale to 30 items; 16 items reflect family cohesion, and 14 items reflect family adaptability. Empirical data support the total scale (α = .90) and its subdimensions (α = .78 for adaptability; .87 for cohesion) are internally consistent and stable over time (.83 for cohesion and .80 for adaptability) after 4 to 5 weeks (Olson et al., 1992).

Developers of the FACES II provide empirical evidence of its content and concurrent validity using similar constructs. Correlations with the Dallas Self-Report Family Inventory, a global measure of family health, were .93 for cohesion and .79 for adaptability (Olson et al., 1992).

While the utility of the FACES II with diverse cultures is documented, the interpretation of family system style is somewhat different based on ethnic background. Balanced family systems, identified based on cohesion and adaptability scores, are generally considered optimal in terms of family functioning; however, extreme types also may be considered functioning well as long as the family members like the way the family is functioning. This change is based on normative data that supports family behaviors at the

extreme type based on culture (e.g., Amish families, Mormons). The reading level of the FACES II is about a seventh-grade level. Normative data are available for each stage of the family life cycle.

Although there is a more recent version of the FACES (FACES III), the FACES II was selected for this study based on stronger support for the reliability and validity of the original instrument. The FACES II has higher alpha reliability for both subscales as and the total scale. Concurrent validity also is reported to be higher for FACES II (Olson, et al., 1992).

Administration and Scoring. Permission for using the FACES II was obtained from Olson (Appendix B). For purposes of this study, the instrument was administered via telephone to CABGS patients. Total cohesion and total adaptability scores were obtained based on respondents' scores for particular items. Cohesion scores can range from a low of 15 (disengaged) to a high of 80 (very connected). Adaptability scores range from a low of 15 (rigid) to a high of 70 (very flexible). Family type scores range from 1 through 8, with family type scores of 1 or 2, 3 or 4, 5 or 6, and 7 or 8 representing extreme, mid-range, moderately balanced, and balanced family types, respectively. Researchers using the FACES II have also used a total score, combining cohesion and adaptability scores (Saunders, 1999; Woods, Haberman, & Packard, 1993). Reported reliability coefficients using the total score are .91 and .82. Time to complete the instrument is less than 10 mins.

The model on which the FACES II is based proposes a curvilinear relationship of family functioning based on cohesion and adaptability scores. Using combinations of the four levels of cohesion and adaptability described previously, sixteen distinct family sys-

tems are identified. Of the sixteen possible systems, four are considered balanced; eight of the systems are extreme in one of the dimensions and moderate in the other dimension; the remaining four family systems are extreme in both dimensions of cohesion and adaptability (Olsen et al., 1992). The extreme ranges are considered most dysfunctional, and the central ranges are considered a functional family system.

Despite the curvilinear relationship, empirical data have indicated that the FACES II does not capture the extremely high categories of cohesion and adaptability; therefore, the developers devised a linear scoring and interpretation method. Using the linear model of interpretation, high scores on cohesion and adaptability are reinterpreted as "very connected" and "very flexible."

For purposes of this study, a total score, combining the adaptability and cohesion scores, was used for data analysis. Scores could range from a minimum of 30 to a maximum of 150. Using the linear scoring and interpretation model, higher scores indicate increased cohesion and flexibility. A family type score was determined and used for descriptive purposes only.

Mental Health Index-5 (MHI-5)

Purpose and Description. The mental health subscale of the SF-36 Health Survey was used to assess the psychological well-being of CABGS patients 3 weeks postdischarge. The SF-36 Health Survey is an instrument that assesses a variety of health concepts, including physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health (Ware et al., 2000). The mental health subscale was selected for this study to measure one specific aspect of patient health, psychological well-being, during recovery following CABGS.

The mental health subscale is a five-item mental health index (MHI-5) (Appendix A) designed to reflect behavioral functioning and perceived well-being, manifestations of mental health. The MHI-5 was developed from a 38-item mental health scale using the five items that best predicted the summary score for the 38-item instrument. While other SF-36 subscales assess aspects of mental health, the MHI-5 was selected because it reflects four major dimensions of mental health: anxiety, depression, a loss of behavioral/emotional control, and psychological well-being. A six-point Likert scale is used for participants to respond to how frequently they have experienced the feelings described in the five items during the previous 3 weeks, with a score of six indicating "All of the time" and a score of one indicating "None of the time" (Ware et al., 2000).

Relationship to Conceptual Model. The Double ABCX proposes that the accumulative impact of family stressors has the potential to affect family adaptation. The conceptual model for this study adds another variable by proposing that family stress and family adaptation will also affect patient recovery following CABGS. A premise of family stress theory is that factors affecting the family also have an impact on individual family members; therefore, as family stressors accumulate, the greater the potential for a negative effect on individual members. Additionally, family stress theory also suggests that because of the relationship between family members, the family is "most likely to act as a buffer to absorb the strains and stressors its members experience" (Turk & Kerns, 1985, p. 9).

CABGS patients and their families experience many types of demands related to recovery. One frequently cited concern for both patients and families is the psychological state of the patient during recovery. Many factors affect the psychological well-being of the patient recovering following CABGS, including family support (Burker et al., 1995;

White & Frasure-Smith, 1995). The conceptual model for this study suggests that family adaptation is a mediator between the pile-up of demands and the psychological well-being of the CABGS patient during recovery.

Psychometric Properties. As previously described, the MHI-5 was developed from a 38-item mental health scale. Based on factor analysis studies of the full instrument, four dimensions of mental health were identified: anxiety, depression, a loss of behavioral/emotional control, and psychological well- being. The MHI-5 consists of five items that best predicted the summary score of the full instrument. The correlation between the MHI-5 and the 38-item mental health measure was .95 (Ware et al., 2000).

Reliability and validity studies of the MHI-5 are extensive. Cronbach's alphas for internal consistency of the MHI-5 scale range from .81 to .95, and test-retest correlations range from .75 to .80. The sensitivity of the scale to relatively short-term changes such as those observed in 2-week intervals are thought to account for the lower test-retest reliabilities. Reliability estimates for the MHI-5 among subgroups of differing ages, gender, race, education, and socio-economic status range between .86 and .90. Similarly, reliability coefficients based on medical diagnosis and disease severity are between .82 and .88 (Ware et al., 2000).

Content validity is supported by the differences in scale scores between the extreme levels. The MHI-5 is comprised of five items, with a possible raw score range of 25. The lowest possible raw score is 5, reflecting "feelings of nervousness and depression all of the time"; the highest possible raw score is 30, reflecting a respondent who "feels peaceful, happy, and calm all of the time" (Ware et al., 2000).

Factor and principle components analysis supported empirical validation of physical and mental health, the two major health components for the SF-36 Health Survey. Analysis of item internal consistency found correlations ranging from .65 to .81 for the five items of the MHI-5 and the subscale. Tests of discriminant validity further supported construct validity. Correlations between the five items of the MHI-5 and the other subscales of the SF-36 Health Survey ranged from .11 to .59. Correlations of the five items with the other subscales were all lower than correlations with the MHI-5 (McHorney, Ware, & Raczek, 1993; Ware et al., 2000).

Criterion-based validity has been established using eight independent mental health criteria. These independent criteria included dissatisfaction with life, depressive symptoms, diagnosis of depression, suicide ideation, outpatient mental health care, mental health specialty care, inpatient mental health care, and the long form of the Mental Health Scale. Frequency of item response categories of the MHI-5 ("All," "Most," "Good Bit," "Some," "A little," and "None") were examined in relationship to scores on the eight independent criteria. As was expected, the worst outcomes of the independent criteria were most prevalent in the lowest MHI-5 response category (negative feelings occurring "All" of the time) and least prevalent in the highest MHI-5 response category (negative feelings occurring "None" of the time). Additionally, percentages consistently decreased from the lowest item response category to the highest item response category. Average prevalence of a response category decreased approximately 10 percentage points from level to level. Use of independent criteria provides external evidence of the validity of the MHI-5 (Ware et al., 2000).

The MHI-5 has been compared to other, longer versions of the MHI. Compared to the MHI-32 or 18, reliability differs by 8 points (i.e., decreases from .98 to .90), and rela-

tive precision falls from 1.00 to .93, reflecting the ability of the instrument to identify differences. While the longer instrument has greater reliability and precision, the reliability and precision of the MHI-5 exceeds acceptable standards. A major advantage of the MHI-5 for the population of interest in this study is a reduction in respondent burden, as the MHI-5 is a much shorter instrument, with an administration time of less than one minute (Ware et al., 2000).

Administration and Scoring. Permission for using the MHI-5 was obtained (Appendix B). The MHI-5 is comprised of five items. Respondents answered each item on a 6-point Likert-type scale indicating how they felt during the preceding 3 weeks. Item responses range from "All of the time" to "None of the time." A raw MHI-5 score was calculated by adding the five item values. For three of the items, pre-coded item values and final item values are the same, with response choices of "All" having a value of 1, "Most" having a value of 2, up to a response of "None" having a value of 6. For the remaining two items, the pre-coded values are the same; however, recoding of these two items is done prior to computing a total score. Point values were reversed for these two items, with a response of "All" having a value of 6, and a response of "None" having a value of 1 (Ware et al., 2000).

Raw scores were transformed to a 0 to 100 scale using a specified formula. Transformation of the raw score converts the lowest possible score to 0 and the highest possible score to 100. The transformed scores were used to compare results with normative data (Ware et al., 2000). For purposes of this study, the MHI-5 was administered via telephone to the CABGS patients approximately 3 weeks postdischarge from the hospital.

Clinical Risk Score

Purpose and Description. The Clinical Risk Score (CRS) (Appendix A) was developed as a practical method for estimating morbidity and mortality among CABGS patients. The CRS uses readily available preoperative markers of severity of illness (Tuman, McCarthy, March, Najafi, & Ivankovich, 1992). For purposes of this study, the CRS was used as an indicator of illness severity in describing the sample and as a potential control variable for testing study hypotheses. The CRS was completed via chart review prior to patient discharge from the hospital.

Relationship to Conceptual Model. The conceptual model for the study examines the relationship of the pile-up of demands and family adaptation and the psychological well-being of the CABGS patient during early recovery after discharge. Contributing to the pile-up of demands are the demands on the family due to the illness. The CRS provides a quantifiable indicator of illness severity. Many of the preoperative markers used by the CRS are also variables that have been identified as affecting postoperative recovery following CABGS. These markers include age, gender, other chronic conditions, and cardiac function (Tuman et al., 1992)

Psychometric Properties. The CRS was developed as part of a prospective analysis of 3,156 consecutive adult patients undergoing CABGS or cardiac valvular surgery. Of the 3,156 patients, 34.3% were between the ages of 65 and 74, and 13.8% were 75 years of age or older. Factors previously documented as being associated with greater mortality and morbidity after cardiac surgery, along with patient demographics, were selected for examination. The preoperative risk assessment was done during a preoperative

visit, with each factor being clearly defined (e.g., renal dysfunction was described as a preoperative creatinine concentration of > 1.4 mg/dl). Morbidity was defined as the presence of one or more of specific complications related to cardiac, pulmonary, renal, infectious, or neurologic problems (Tuman et al., 1992).

Pearson X^2 statistic was used to evaluate the univariate association of the 17 preoperative risk factors with morbidity and mortality. Stepwise logistic regression analyses were used to identify multivariate predictors of aggregate morbidity and mortality as well as of the individual categories of morbidity. Factors in the final regression analysis for aggregate morbidity were assigned a point system based on the estimate of the coefficient in the regression equation and the estimate of the odds ratio calculated from the coefficient. A risk score was then determined using the point system (Tuman et al., 1992).

Fifteen of the variables demonstrated significant association with the occurrence of one or more operative complications ($p < 0.05$). Eleven variables were identified from the multivariate logistic regression as independent predictors of the occurrence of one or more complications after cardiac surgery. The variables identified as independent predictors include emergency surgery, type of surgical procedure, advanced age, recent myocardial infarction, preoperative renal dysfunction, preoperative cerebrovascular disease, previous cardiac surgery, pulmonary hypertension, congestive heart failure, female gender, and severe left ventricular function. The same variables, with the exception of previous cardiac surgery, were also predictive of overall mortality (Tuman et al., 1992). The predictive ability of the logistic models was best at the lowest probability levels and poorest at the highest probability levels, with 82% correct predictions for survivors and 94% correct predictions for nonsurvivors.

The risk score was validated on a subsequent sample of 394 consecutive adult cardiac surgery patients. The risk score of this validation sample was compared to that predicted from the logistic model derived from the reference group using the x^2 analysis. Good agreement was found between the predicted and observed outcomes in each clinical score tested on the validation group (Tuman et al., 1992).

Administration and Scoring. Each of the preoperative risk factors used in the CRS system was assigned a point value from 1 to 4 based on the odds ratio and degree of significance determined within the logistic model for morbidity. The lowest possible score was 0, and the highest possible score was 25. For purposes of this study, the CRS score was determined by assessing the preoperative variables via chart review.

Sociodemographic and Procedural Data

A sociodemographic data sheet (Appendix A) was developed for this study and used to gather data regarding sample characteristics. Sociodemographic data collected about each CABGS patient included age, gender, ethnicity, economic status, education level, and marital status. Information was also obtained about the family of the patient, including who the patient considered to be his or her family, the number of family members living in the home with the patient, and their relationships to the patient. Additionally, descriptive data were collected regarding the operative procedure and hospitalization (Appendix A). Data gathered related to the surgical procedure included the date of surgery and discharge, the number of days hospitalized prior to surgery, and ICU and total postoperative length of stay (number of days). The number of bypass grafts and the type of surgery (e.g., with or without cardiopulmonary bypass) was also monitored. The

demographic and procedural variables selected were identified from the literature as characteristics potentially affecting recovery following CABGS.

Sociodemographic and procedural data were collected via patient interview and chart review prior to the patient's discharge from the hospital. These data were used for describing the study sample and for comparison with other studies. Appropriateness of demographic and procedural data tools were evaluated during the pilot study.

Bodily Pain

Purpose and Description. Bodily pain was assessed as an intervening variable, potentially affecting psychological well-being. The bodily pain subscale (Appendix A) of the SF-36 Health Survey was used to assess the bodily pain experienced by CABGS patients during the first 3 weeks postdischarge. The subscale is a 2-item measure. One question asks about the intensity of pain; the other item measures the extent to which pain interferes with normal activities. Participant responses are rated using a 6-point Likert scale. For measuring pain intensity, a score of one indicated no pain, while a score of 6 indicated severe pain. Similarly, a response of one indicated that pain had interfered "Not at All" with work activities, and a response of 6 indicated "Extreme" interference with activities (Ware et al., 2000).

Psychometric Properties. The BP subscale, as part of the SF-36 Health Survey, has been used extensively with a variety of patient populations. Reported Cronbach's alpha reliabilities for internal consistency for the subscale have ranged from .78 to .88. Alpha reliabilities for the subscale reported for subgroups based on age, gender, race, and education have ranged from .80 to .87 (Ware et al., 2000).

Criterion-based validity has been reported. As previously discussed, factor and principle components analysis has supported empirical validation of the physical and mental health components of the SF-36 Health Survey. As hypothesized, strong associated was found between the bodily pain subscale and the physical components (.77), and a weak association was found between the bodily pain subscale and the mental health component (.24) (Ware et al., 2000).

Administration and Scoring. Permission to use the bodily pain subscale was received with permission for the SF-36 Health Survey (Appendix B). Respondents answered the question related to bodily pain on a 6-point Likert scale. Item responses ranged from "None" to "Very Severe." A Likert scale with five possible answers is used for the second question related to interference with normal work. Responses to this question ranged from "Not at All" to "Extremely." A raw score is determined using a prescribed formula recommended by the developers of the SF-36 Health Survey. The scoring method accounts for the unequal number of response choices between the two items. Raw scores are then transformed to a 0 to 100 scale, again using a specified formula. Transformation of the raw score converts the lowest possible score to 0 and the highest possible score to 100. The lowest score reflects very severe and very limiting pain, whereas the higher score reflects no pain or limitations (Ware et al., 2000).

Data Collection

Identification of Subjects

Data collection took place over 11 months. After obtaining all necessary Institutional Review Board approvals and agency permissions (Appendix C), the researcher met

with the unit directors and staff on the appropriate units at each site to inform them of study procedures and seek their support.

The researcher identified potential participants at the data collection sites by contacting the charge nurse on the hospital unit where postoperative CABGS patients were transferred from the ICU. The charge nurse provided names and rooms numbers of CABGS patients 65 years of age or older transferred from the ICU. No other identifying information or medical record information was obtained before receiving participant consent in accordance with Healthcare Insurance Portability Accountability Act (HIPAA) regulations.

Procedures

On the first or second day after transfer from the ICU, the researcher visited patients meeting the previously described inclusion criteria to discuss the study. This interview was done in the patient's room. The interview was done at a time when the patient was not likely to be disturbed by hospital staff. All CABGS patients were in private rooms. During this visit, the purpose of the study was explained and patients were given an information brochure (Appendix D) about the study. The remaining inclusion criteria were evaluated, including absence of postoperative neurological complications, PLOS of less than 14 days, residence prior to surgery, planned discharge to a family residence, orientation, ability to understand and speak English, access to a telephone, and ability to hear and communicate via phone. All criteria were evaluated via patient interview and self-report. Patient orientation was further evaluated from documentation in the patient's care flowsheet.

After allowing patients 24 hr to consider, written consent was obtained from those patients meeting all inclusion criteria and agreeing to participate. After obtaining informed consent (Appendix E), the demographic data form, procedural data form, and CSR score were completed. Participant status was monitored until discharge to ensure continued eligibility (PLOS < 14 days; without altered mental status according to the care flowsheet).

Approximately 14 days after discharge the researcher contacted the subject via telephone to schedule a telephone appointment for completing the study surveys so that data collection occurred approximately 21 days after discharge. The telephone interview was scheduled at the patient's convenience and at a time that is normally a quiet time in his or her daily routine. The researcher sent copies of the instruments to the participant after scheduling the telephone interview to facilitate data collection over the telephone. A large font was used for the instruments to facilitate readability. At the time of the scheduled telephone appointment, the following surveys were completed: FILE, FACES II, and the MHI-5. The telephone interview for data collection took approximately 30 mins.

Protection of Human Subjects

On the first or second day after transfer from the ICU patients who met study inclusion criteria were visited by the researcher who explained the purpose of the study and obtained written consent from those patients agreeing to participate. To ensure informed consent, verbal and written information were provided explaining the purpose of the study, the procedures to be followed, the potential risks or discomfort that might be experienced, as well as possible benefits, as a result of participation. In addition, the informed consent ensured the participant that all information was confidential and used

only for data analysis. Number coding was used with all instruments and data collection forms to maintain confidentiality. The informed consent ensured participants that they could withdraw from the study at any time.

Potential risks in participating in the study were minimal. Participants may have experienced some fatigue in completing the study instruments. Data collection, in the hospital and at home via telephone, was conducted at the convenience of the participant, and rest periods provided when needed. If the participant experienced any physical or emotional distress during the data collection, data collection was stopped immediately and appropriate referrals to the participant's health care provider were made. Participants could have requested to stop their participation at any time. Confidentiality of all instruments and interview data was maintained through number coding. Documents with participant names, codes, and other identifying information were kept in a locked file separate from data.

The benefit of participation was the increased knowledge about the relationship of family stress on the psychological well-being of elderly CABGS patient during early recovery. Information gained from the study could be beneficial to healthcare providers in recognizing CABGS patients who may have increased difficulty during early recovery. Health care providers will be able to use this knowledge to better prepare patients and their families for discharge following CAGBS. Participants received a $10 gratuity for participating in the study at completion of the data collection.

Data Analysis

The Statistical Package for the Social Sciences, Version 11 (2001), was used for purposes of data entry and analyses. Descriptive statistics were used to describe the

demographic and family characteristics of the sample. Frequency distributions and, where appropriate, measures of central tendency, were reported for age, gender, marital status, ethnicity, education level, the number of family members living in the home, and the relationship of family members to the patient. Descriptive statistics also were used for analyses of surgical and hospitalization data, including ICU length of stay, postoperative length of stay, number of hospital days prior to surgery, the surgical procedure, and number of bypass grafts.

Scores on the FILE, FACES II, MHI-5, and CRS were analyzed using frequency distributions and measures of central tendency. In addition, Cronbach's alpha reliability coefficients were determined for the four instruments.

A correlation matrix was used to determine intercorrelations among the study variables of pile-up of demands, family adaptation, psychological well-being, and the control variables of clinical risk score and bodily pain. Single-order relationships among the variables in Hypotheses 1, 2, and 3 were examined using Pearson's *r* correlations. All research hypotheses were tested at the .05 level of significance.

Hypothesis 4, examining the mediating role of family adaptation, was evaluated using Pearson's correlations and regression analysis. Regression analyses are dependent upon assumptions related to the level of measures and the data. With regression analysis, the independent and dependent variables must be measured on either an interval or ratio scale. Assumptions related to data include a normal distribution of the residuals, homoscedasticity, and independence (Miles & Shevlin, 2001). Tests for normality were done. If the assumption of normality was not met, scores were transformed using log transformation to achieve normality.

Pilot Study

The pilot study was conducted at Agency 1. The pilot study served three purposes: to evaluate the procedure outline for the study; to evaluate the reliabilities of the study instruments; and to evaluate the administration of the FACES II via telephone interview. Institutional Review Board approval and agency permission (Appendix F) were obtained prior to data collection.

Procedures

The investigator met with the unit director and unit staff to explain the study and elicit their support. The original protocol specified that initial identification of potential participants would be done as patients were admitted to the ICU. At the request of the agency, the protocol was changed so that patients would be identified on the postoperative unit after transfer from the ICU.

The charge nurse was contacted on a daily basis to identify potential participants from those patients transferred to the unit from the ICU. The investigator was notified of patients who had transferred who met initial inclusion criteria of age and surgical procedure. On the day of transfer from the ICU, the investigator visited potential participants to inform them of the study. Potential participants were given a brochure describing the study. On the second or third day after transfer from the ICU, the investigator revisited the patients to evaluate inclusion criteria and to see if they were willing to participate. If the patient agreed, written informed consent (Appendix F) was obtained. After receiving consent, the investigator interviewed the patient and reviewed the medical record to obtain demographic data and procedural and hospital data. Data collection tools developed

by the researcher were used to collect this information (Appendix A). Patients were monitored until discharge to ensure continued eligibility.

Approximately 14 days after discharge, participants were telephoned by the researcher to schedule a home visit to complete the FILE, FACES II, the MHI-5, and the BP subscale. Interviews were scheduled so that instruments were completed 3 weeks after the participant was discharged. To evaluate telephone administration of the FACES II, participants again completed the FACES II 5 days after the home visit.

Sample

Fourteen patients consented to participate in the pilot study. Of the 14 participants who consented, eight completed the home visit and telephone interviews. Reasons for participants not completing the protocol included family emergency (1), unable to contact by telephone (3), rehospitalization (1), and refusal (1). The sample, therefore, was comprised of eight patients.

Data Analysis

Cronbach's alpha internal consistency reliabilities were determined for the FILE, FACES II, and the MHI-5. Internal consistency for the FILE was alpha .87. The MHI-5 had an alpha of .86, and the bodily pain subscale had an internal constancy reliability of .89. Internal consistency reliabilities for the FACES II were alpha .91 for the home visit and alpha 0.87 for the telephone administration.

To further evaluate administration of the FACES II via telephone, a Kendall's tau correlation coefficient was conducted between the scores from both methods. The non-

parametric test was done because of the small sample size. Results of the Kendall's tau indicated a correlation coefficient of .79 ($p = .02$).

Conclusions and Recommendations

Results of the pilot study indicated that the study instruments had sufficient internal consistency reliabilities as evidenced by Cronbach's alpha. No problems were identified with the data collection tools developed specifically for the study. Examination of the association between the two techniques for administering the FACES II indicated a strong and significant correlation between the two methods; therefore, the telephone administration of the instrument was determined to be acceptable.

As a result of the pilot study, one change was made in the procedure for recruiting participants. During the pilot study, participants were initially approached about participation on the same day they were transferred from the ICU. Because of the physical and mental condition of patients on that day, it was determined that it was more appropriate to contact patients on the second or third day after transfer from the ICU. This procedural change was made for the full study. No other procedural changes were recommended.

CHAPTER 4

FINDINGS

The purpose of the study was to describe the relationship between the pile-up of demands, family adaptation, and the psychological well-being of elderly CABGS patients 3 weeks after discharge from the hospital. Chapter 4 presents the findings of statistical analyses used to address the purpose of the study and to test hypotheses posed in the study. Reporting of data is organized into three sections: (a) description of the sample, (b) analyses of study instruments, and (c) data analyses related to study hypotheses. All data analyses were done using the Statistical Package for the Social Sciences, Version 11 (2001).

Description of the Sample

After obtaining appropriate approvals, recruitment of subjects began at Agency 1. A second site, Agency 2, was added 3 months later. Three hundred and fifteen potential subjects were identified based on age and surgical procedure at the two sites. Of the 315 potential subjects initially identified, 58 consented to participate in the study; 42 (72.4%) were from Agency 1 and 16 (27.6%) were from Agency 2. Table 1 provides a summary of reasons why consent was not obtained from other potential participants.

Of the 58 participants who consented, 42 (72.4%) completed the interview conducted 3 weeks after discharge from the hospital and, thus, compose the sample for this study. Sixteen subjects who consented to participate in the study did not complete the in-

terview for an attrition rate of 27.6%. A summary of reasons for participants not completing the study is provided in Table 2.

Table 1

Summary of Reasons for Not Consenting to Study

Reason	Frequency	Percentage
Discharged prior to contact by researcher	110	42.8
Did not meet eligibility criteria		
Valve procedure	30	11.7
Altered mental status	22	8.6
"Re-do" procedure	10	3.9
Not discharged home	12	4.7
Did not speak English	4	1.5
Postoperative Complication	9	3.5
PLOS > 2 weeks	3	1.2
Other	8	3.1
Refused	25	9.7
Unknown	24	9.3

Table 2

Reasons for Not Completing Interview

Reason	Frequency	Percentage
Declined to complete interview	8	50.0
Unable to reach by phone	4	25.0
Re-hospitalized	2	12.5
IRB expired	2	12.5

Table 3 depicts detailed characteristics of the sample. The average age of patients completing the study (N = 42) was 69.9 years (*SD* = 3.73), with a range of 65 to 80 years. The majority of participants were male (85.7%), Caucasian (95.2%), and married (92.9%). The majority of the participants reported having a high school diploma (28.6%) or some college education (33.3%). The most frequently reported economic status was an annual household income between $35,000 and $49,999.

Data also were collected regarding the number of individuals living in the household and their relationships with participants. Additionally, participants were asked the question "Who do you consider to be your family?" The number of family members living in the household with the participants ranged from one to five additional family members. Analysis of responses revealed that 92.9% of participants had at least one other family member living in the home; only three participants lived alone. Of the participants who had another family member living in the home, all lived with their spouse. In addition to the spouse, 14% shared a home with an adult child, 16.7% lived with a grandchild or great-grandchild, and 7% had elders living in the same home.

When asked "Who do you consider to be your family?" all married respondents included their spouse, and 74.3% also included their children and grandchildren. Of the participants responding to the question, 76.2% included individuals from outside the home as part of their family. The three individuals living alone referred to adult children and grandchildren as their family. At least four participants described their family as including an extended family of brothers, sisters, nieces, and nephews.

An examination of procedural variables related to the CABGS (Table 4) indicates that most subjects had an emergent procedure (64.3%) involving cardiopulmonary bypass

Table 3

Sociodemographic Information (N = 42)

Variable	Frequency	Percentage
Gender		
Male	36	85.7
Female	6	14.3
Age		
65 - 68	18	42.9
69 – 72	16	38.1
73 – 76	5	11.9
77 – 80	3	7.1
Ethnic Background		
Caucasian	40	95.2
African-American	1	2.4
Hispanic	1	2.4
Marital Status		
Married	39	92.9
Widowed	2	4.7
Divorced/ Separated	1	2.4
Educational Level		
No High School	4	9.5
Some High School	7	16.7
High School Graduate	12	28.6
Some College	14	33.3
Undergraduate College Degree	3	7.1
Graduate Degree	2	4.7
Economic Status		
< 14,999	1	2.4
15,000 – 24,999	3	7.1
25,000 – 34,999	11	26.2
35,000 – 49,999	12	28.6
50,000 – 74,000	9	21.4
> 75,000	2	4.7
Refused to answer	4	9.5

Note. Percent totals may not equal 100% due to rounding of numbers.

(85.7%). The number of coronary artery grafts done during surgery ranged from one to six with a mean of 3.48 (*SD* = 1.22).

Table 4

Procedural Information (N = 42)

Procedure Characteristic	Frequency	Percentage
Urgency of Surgery		
Elective	11	26.2
Emergent	27	64.3
Urgent	4	9.5
Type of Procedure		
With bypass	36	85.7
Off bypass	6	14.3
Number of Grafts		
1 - 2	10	23.8
3 - 4	25	59.5
5 - 6	7	16.7

Participants were hospitalized prior to surgery from one to 7 days, with the majority (64.3%) being hospitalized either the day before or the day of surgery. Thirty -eight participants (90.5%) were transferred out of the ICU the day after surgery. The average PLOS was 4.74 days (*SD* = 1.74), with most participants being discharged on the fourth postoperative day (Table 5).

For purposes of this study, the CRS was used as an indicator of preoperative surgical risk. The CRS was determined via chart review prior to patient discharge from the hospital. Scores on the CRS can range from 0 to 25, with a higher score indicating higher cuity. The CRS score for this sample ranged from 1 to 9 with a mean of 2.88 (SD = 1.95).

Table 5

Hospitalization Information (N = 42)

Variable	Frequency	Percentage
Days Hospitalized Prior to Surgery		
0 –1	27	64.3
2 –3	4	9.5
4 –5	9	21.4
6 – 7	2	4.8
ICU Length of Stay		
1	38	90.5
2	1	2.4
3	2	4.8
4	1	2.4
Postoperative Length of Stay		
2 –3 days	9	21.4
4 –5 days	22	52.4
6 –7 days	9	21.4
8 –9 days	1	2.4
> 10 days	1	2.4

Note. Percent totals may not equal 100% due to rounding of numbers.

Additional Analysis of the Sample

Because of the attrition rate of participants after giving consent, data were examined to determine if there were any significant differences between those who completed the interview (responders) and those who did not (nonresponders). Table 6 provides a comparison of frequencies of sample characteristics between responders and non-responders.

Independent t-tests were done to determine differences related to age, number of days hospitalized prior to surgery, ICU length of stay, PLOS, number of coronary artery grafts performed during surgery, and the CRS between those responding and not responding to the interview. Independent t-tests (with a Bonferroni adjustment to reduce Type I

Table 6

Differences between Interview Responders and Non-Responders

Characteristic	Frequency	
	Responders	Non-Responders
Gender		
Male	36	10
Female	6	6
Marital status		
Married	39	8
Widowed/ Divorced	3	6
Unknown	0	2
Ethnicity		
Caucasian	40	15
African American	1	1
Hispanic	1	0

Note. Table does not include data related to educational level or economic status as data were not available for nonresponders.

error; $p < .004$) revealed no differences between the two groups related to number of days hospitalized prior to surgery, postoperative length of stay, and number of coronary artery grafts. Nonresponders tended to be slightly older ($M = 72.94$, $SD = 6.01$) than those who responded to the interview ($M = 69.88$; $SD = 3.73$). Nonresponders had a longer ICU length of stay ($M = 2.44$; $SD = 2.53$) than responders ($M = 1.19$; $SD = .63$). Postoperative length of stay was also somewhat different between the groups, with nonresponders having a longer PLOS ($M = 6.31$; $SD = 3.57$) than responders ($M = 4.74$; $SD = 1.74$). All differences, however, were statistically nonsignificant.

The CRS was significantly different between the participants who completed the interviews and those who did not ($t = -3.11$; $df = 56$; $p = .003$), with the responders having a significantly lower transformed score ($M = .37$) than those who did not complete the

interview (M = .63). Prior to this analysis, the CRS score was examined for normal distribution of scores. The Kolmogrov-Smirnov test indicated that the CRS score for the sample was not normally distributed; therefore, the score was transformed to a base 10 log. The transformed CRS scores were then examined for normality and were found to be normally distributed. Transformed CRS scores were, therefore, used for all analysis.

Differences in sample characteristics related to personal, procedural, and hospital information between the two data collection sites also were examined. No differences were found between Agency 1 and Agency 2 in relation to age, days hospitalized prior to surgery, ICU length of stay, PLOS, or number of coronary bypass grafts. Additionally, no differences in age, marital status, ICU length of stay, PLOS, or number of coronary artery grafts were found based on gender, marital status, or type of surgical procedure.

Descriptive Summary of Participant Responses to Instrumentation

Instruments used to measure the study variables included the Family Inventory of Life Events (FILE), the Family Adaptability and Cohesion Scale (FACES II), and the Mental Health Index-5 (MHI-5). Participant responses to the study instruments were analyzed using descriptive statistics. Internal consistency was determined for all instruments using Cronbach's alpha.

FILE

For purposes of the study, the FILE was used as a measure of family stress. The FILE was administered to study participants by telephone 3 weeks after discharge from the hospital following CABGS. Participants reported whether or not each of the 71 family stressors identified by the FILE had occurred in their family during the previous year by

answering "yes" or "no." Raw scores were determined by counting the number of "yes" responses. Internal consistency reliability of the FILE was Cronbach's alpha of .82. The Kolmogrov-Smirnov test indicated that the distribution of FILE scores was normal.

The number of stressors reported by participants ranged from 1 to 25, with a mean of 8.21 ($SD = 5.53$) (Table 7). Fifty-two percent of the sample reported seven or fewer family stressors. Of the 71 stressors, ten were never identified as a source of family stress by this sample. Table 8 lists the most frequently reported family stressors. For comparing to national norms, a weighted score also was calculated. The weighted scores ranged from 44 to 1079 ($M = 347.10$; $SD = 248.71$).

Using independent t-tests (with a Bonferroni adjustment; $p < .004$), no differences were found in FILE scores based on gender or marital status. Likewise, there were no differences in FILE scores based on data collection site or type of surgical procedure. Descriptive statistics also were used to examine the nine subscales of the FILE. The subscale with the most reported family stressors was "Work-Family Transitions and Strains," followed by "Illness and Family Care Strains" and "Finance and Business Strains." All participants reported at least one stressor related to illness and family care strains, while 73.8% reported stressors related to work and family transitions. The types of stressors reported least frequently were "Family Legal Violations" and " Pregnancy & Childbearing Strains." Ninety-three percent of participants reported no "Family Legal Violations," and 90.5% of participants reported no "Pregnancy & Childbearing Strains." Table 7 provides a summary of the mean number of stressors for each subscale as well as the possible and observed range of score and subscale internal consistency reliabilities.

Table 7

Descriptive Statistics and Internal Consistency of FILE (N = 42)

Subscale	Mean	SD	Possible range	Observed range	IC
FILE score	8.21	5.53	0 to 71	1 to 25	.82
FILE weighted score	347.10	248.71	0 to 3307	44 to 1079	na
Subscales					
Intra-family strains	1.24	1.76	0 to 17	0 to 10	.70
Marital strains	.14	.42	0 to 4	0 to 2	.28
Pregnancy/ Childbearing	.12	.40	0 to 4	0 to 2	.36
Finance/ Business strains	1.71	1.63	0 to 12	0 to 6	.53
Work- Family Transitions	1.86	1.87	0 to 10	0 to 5	.63
Illness / Family Care strains	1.76	.96	0 to 8	1 to 4	.33
Losses	.71	.77	0 to 6	0 to 3	.12
Transitions "In & Out"	.55	.74	0 to 5	0 to 2	.14
Family Legal Violations	.12	.45	0 to 5	0 to 2	.54

Table 8

Most Frequently Reported Individual Family Stressors

Individual Stressor	Frequency
Parent/ Spouse became seriously ill	42
A member purchased a car or other major item	19
Close friend of the family died	16
Increase in number of tasks or chores which don't get done	15
Close relative or friend of the family became seriously ill	12
A member was promoted at work or given more responsibilities	12

FACES II

The FACES II was used to measure family adaptation. Study participants completed the FACES II by telephone 3 weeks after discharge from the hospital. Total possible scores for the FACES II range from a minimum of 30 to a maximum of 150, with a higher score indicating increased family adaptation. Using descriptive analysis, scores obtained from participants in this study ranged from 80 to 142 with a mean of 116.62 (*SD* = 15.24) (Table 9). Overall internal consistency reliability for the instrument was Cronbach's alpha of .78. Scores for the FACES II were normally distributed as indicated by the Kolmogrov-Smirnov test.

FACES II scores were examined for differences based on data collection site, gender, marital status, and type of surgical procedure. Using independent t-tests with a Bonforroni adjustment ($p < .004$), no differences were found in FACES II scores for these variables.

Two subscales comprise the FACES II: the cohesion subscale and adaptability subscale. Descriptive statistics were also used to examine participant responses for each subscale. The minimum possible score for the cohesion subscale is 15 with a maximum score of 80; a higher score indicates increased family cohesion. Scores for the cohesion subscale ranged from 36 to 78 (M= 63.40; SD = 9.67). Internal consistency reliability for the cohesion subscale was Cronbach's alpha of .56. Adaptability subscale scores ranged from 39 to 65 (M = 53.21; SD = 6.65) out of a possible 15 to 70. A higher score for this subscale indicates increased flexibility. Internal consistency reliability for the adaptability subscale was alpha .67. As with the FACES II total scores, no differences in either subscale scores were found based on data collection site, gender, marital status, and type of

surgical procedure. Table 9 provides a summary of the descriptive analysis and internal consistency reliability coefficients for the FACES II.

Table 9

Descriptive Statistics and Internal Consistency of FACES II (N = 42)

Scale/ Subscale	Mean	SD	Possible Range	Observed Range	IC
FACES II Total	116.62	15.24	30 to 150	80 to 142	.78
Subscales					
Cohesion	63.40	9.67	15 to 80	36 to 78	.56
Adaptability	53.21	6.65	15 to 70	39 to 65	.69

Using the scoring and interpretation guidelines recommended by the developers of the FACES II, family types were determined for participants (Table 10). Cohesion subscale scores indicate that 38.1% of participants perceived their family as "connected." Analysis of the adaptability subscale scores find that 50% of participants perceived their family as "very flexible." Based on interpretation of scores, 50% of participants had a "balanced" family type.

MHI-5

The MHI-5, a subscale of the SF-36 Health Survey, was used to measure the psychological well-being of CABGS patients 3 weeks postdischarge. Responses to the MHI-5 were obtained by telephone.

Raw scores from the MHI-5 were transformed to a 0 to 100 scale using a specified formula. Transformation of the raw score converts the lowest possible score to 0 and

Table 10

Summary of Family Types

Family Type	Frequency	Percentage
Cohesion		
Very connected	12	28.6
Connected	16	38.1
Separated	9	21.4
Disengaged	5	11.9
Adaptability		
Very flexible	21	50.0
Flexible	14	33.3
Structured	6	14.3
Rigid	1	2.4
Family Type		
Balanced	21	50.0
Moderately balanced	11	26.2
Mid- range	10	23.8
Extreme	0	0.0

the highest possible score to 100. The transformed scores were used for descriptive analysis. For this study, MHI-5 scores ranged from 28 to 92 ($M = 63.05$; $SD = 17.46$), with a higher score indicating better mental health. Table 11 provides a summary of the descriptive statistics for the MHI-5. Internal consistency reliability for MHI-5 was Cronbach's alpha of .83. Scores for the MHI-5 were normally distributed as indicated by the Kolmogorov-Smirnov test. As with the FILE and FACES II, no differences were found in MHI-5 scores based on gender, marital status, type of surgical procedure, or data collection site.

Bodily Pain

The bodily pain subscale for the SF-36 Health Survey was used to obtain data regarding physical pain experienced by the participants that may affect psychological well-being. As with the MHI-5, raw scores were transformed to a 0 to 100 scale using a specified formula. With the transformation of the raw score, the possible range in scores is 0 to 100. The transformed scores were used for descriptive analysis. The average score for bodily pain reported by participants was 58.9 (SD = 20.54). Additional descriptive analysis is presented in Table 11. Internal consistency reliability of the bodily pain scale was Cronbach's alpha of .65. The Kolmogrov-Smirnov test confirmed normal distribution of bodily pain scores. No significant differences were found in bodily pain scores based on gender and type of surgical procedure.

Table 11

Descriptive Statistics and Internal Consistency of MHI 5 and Bodily Pain Scale

Scale	Mean	SD	Possible Range	Observed Range	IC
MHI 5	63.05	17.46	0 to 100	28 to 92	.83
Bodily Pain	58.90	20.54	0 to 100	22 to 100	.65

Hypotheses Testing

In the following section, each hypothesis is identified and the data analysis used to test the hypothesis is discussed. The .05 level of significance was used for hypothesis testing.

Hypothesis 1

It was hypothesized that there would be a negative relationship between a pile-up of demands and family adaptation. The null hypothesis tested was that there is no relationship between a pile-up of family demands and family adaptation. To test the null hypothesis, a Pearson's correlation was computed examining the relationship between the two variables. While the direction of the relationship was as predicated, no significant correlation was found between family adaptation and family stress ($r = -.26$; $p = .10$) (Table 12).

Table 12

Correlations Between Study Variables

	FILE	FACES II	MHI- 5
FILE	1.00	- .26	- .10
FACES II	-	1.00	.32 *
MHI 5	-	-	1.00

* $p < .05$

Hypothesis 2

It was hypothesized that there would be a positive relationship between family adaptation and patient psychological well-being. The null hypothesis tested was that there is no relationship between family adaptation and patient psychological well-being. To test the null hypothesis, a Pearson's correlation was computed examining the relationship between the scores on the MHI-5 and the total FACES II score. Results indicate a signifi-

cant positive correlation between family adaptation and psychological well-being (r = .32; p = .04) (Table 12).

Hypothesis 3

It was hypothesized that there would be a negative relationship between a pile-up of demands and patient psychological well-being. The null hypothesis tested was that there is no relationship between a pile-up of family demands and patient psychological well-being. Results of the Pearson's correlation indicated a negative, nonsignificant relationship between the two variables (r = -.10; p = .53).

Hypothesis 4

The fourth hypothesis examined the role of family adaptation as a mediating variable between a pile-up of demands and psychological well-being. The null hypothesis was that there is no relationship between family adaptation and a pile-up of demands and psychological well-being. To determine the mediation effects of a variable, a significant direct relationship must exist between the independent variable (i.e., pile-up of demands) and the dependent variable (i.e., psychological well-being) (Baron & Kenny, 1986; Bennett, 2000). Results of Pearson's correlation indicate a nonsignificant relationship between the pile-up of demands and psychological well-being (r = - .10; p =.53).

Despite this finding, regression analysis was done to follow through with statistical procedures used to evaluate a mediating effect of a variable. The regression analysis was performed with psychological well-being as the dependent variable and the pile-up of demands and family adaptation as independent variables. To control for other factors potentially affecting psychological well-being, CRS and bodily pain were also included

as independent variables. All variables were entered into the regression simultaneously (Table 13). The regression model accounted for 6.3% of the variance of the dependent variable (R^2 = .154; adjusted R^2 = .063). None of the independent variables were found to have a significant role in explaining the dependent variable of psychological well-being (F (4, 42) = 1.69; p = .173)

Table 13

Predictors of MHI-5 scores

Variable	Standardized beta	t	Significance Level
CRS	- .24	-1.51	.14
FILE	- .03	0.20	.84
FACES II	- .31	1.97	.06
Bodily Pain	- .03	- 0.19	.85

Additional Analysis

Additional analysis was done to examine the relationships among the FILE subscales and FACES II scores and MHI-5 scores. This analysis was done to determine if specific types of family stressors are related to family adaptation or psychological well-being. Pearson's correlations indicated no significant relationship between family adaptation and any FILE subscale. Similarly, no significant relationships were found among the FILE subscales and the MHI-5 scores.

Relationships among the FACES II subscales, cohesion and adaptability, and the FILE subscales also were examined. A significant, negative correlation was found between family cohesion and intrafamily strains (r = -.38; p = .01). Pearson's correlations

also were done between MHI-5 scores and the subscales of FACES II. A significant positive relationship was found between the MHI-5 and the cohesion subscale of the FACES II ($r = .34$; $p = .03$). The correlation between the MHI-5 and the adaptability subscale was found to be positive, but nonsignificant.

CHAPTER 5

DISCUSSION, LIMITATIONS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of the study was to describe the relationship between the pile-up of demands, family adaptation, and patient psychological well-being 3 weeks after discharge following CABGS in elderly patients. The conceptual framework for the study was an adaptation of the Double ABCX model of family stress.

The sample was comprised of 42 CABGS patients who were 65 years of age or older. Participants were asked to complete study instruments via telephone administration 3 weeks after discharge from the hospital. Instruments used in the study included demographic information, hospitalization information, FILE, FACES II, MHI-5, and a measure of bodily pain. Data were analyzed using descriptive statistics, Pearson correlation coefficient, and linear regression analysis using SPSS 11.0 statistical software (2001). Chapter 5 presents a discussion of the findings, conclusions, implications, and recommendations for future research.

Discussion

Sociodemographic, Procedural, and Hospital Characteristics

The population of interest for this study was elderly CABGS patients. Ages of participants ranged from 65 to 80 years ($M = 69.9$; $SD = 3.73$). Eighty-percent of participants were between 65 and 72 years of age; only three patients were over the age of 76. The small number of patients over the age of 75 may be due to these older patients hav-

ing increased morbidities, longer lengths of stay, and postoperative complications that excluded them from the study. The smaller number also may be due to an increased number of patients of this age not being discharged home but rather to a rehabilitation facility. The small number of patients over the age of 75 provides limited information about this older group of patients and their families. However, the average age of participants in this study was older than many previous family-related studies. The average age of participants in earlier research varied from 56 years to 66 years of age and often focused on CABGS patients 65 years of age or younger (Allen, Becker, & Swank, 1991; Artinian, 1991; Davies, 2000; Sauer et al., 2001). Results of this study, therefore, contribute to a increased understanding of the characteristics and experiences of elderly CABGS patients.

The majority of the participants in this study were Caucasian males. This characteristic is reflective of the general population. National rates indicate that Caucasians are much more likely to have CABGS than African American patients or those with other ethnicities; this disparity is greatest in the southeast (Gillum, 1987; Goldberg et al., 1992; Wenneker & Epstein, 1989) where data collection occurred. Similarly, the incidence of CABGS is greater for males than females, at 69.5% and 30.5%, respectively (AHA, 2003). The gender and racial composition of the sample of this study is similar to most studies of CABGS and may be a reflection of racial and gender health disparities seen in the management of heart disease (Fongwa, 2001). Factors attributed to racial disparities include social class difference, access to care, structural barriers, and lack of cultural awareness on the part of health care providers (Cooper, Hill, & Powe, 2002; Fongwa, 2001; Whittle, Conigliaro, Good, & Joswiak, 1997). Cultural differences related to family structure and the role of family in the health care of a family member may also contribute

to racial differences in the management of heart disease (Cooper et al., 2002). Many of the same variables contributing to racial health disparities have also been identified as factors attributing to gender differences in prevention, diagnosis, and treatment of cardiovascular disease (Glenn, Ramsey, & Alley, 1999; Johnson, Karvonen, Phelps, Nader & Sanborn, 2003).

Education and economic status for participants were representative of the general population of the state in which data collection occurred. The education level of the sample indicated that most participants were high school graduates or had some college education. Seventy-five percent of participants in this study were high school graduates, compared to 78.6% of individuals in the state where data collection occurred. The educational level of participants in this study was also similar to previous studies (Artinian, 1991; Moore, 1995; Sauer et al., 2001). The median income for participants in this study was between $35,000 and $50,000, compared to a median state income of $42,500 (U.S. Census Bureau, 2000). Reports of income level in previous research are sporadic. One earlier study reported the average income of subjects 65 years of age or older was between $30,000 and $39,999 (Artinian, 1993). The educational and income levels of participants in this study reflect an educated and middle-class population. Findings, therefore, can not be generalized to less educated or lower income elderly CABGS patients.

The literature suggests that family support is important to the physical and emotional well-being of patients following CABGS (Cresia, 1992; White & Frasure-Smith, 1995), yet little information is available regarding the family characteristics of older patients undergoing this procedure. Results of this study were that 92.9% of participants were married. The high percentage of married participants is similar to earlier studies of CABGS patients (Artinian, 1993; Guadagnole et al., 1992; King et al., 1992). All partici-

pants, married or not, were able to identify specific individuals they considered to be their family. Most participants, when asked whom they considered to be their family, included not only their spouses but adult children, their children's spouses, and their grandchildren even though these members were not living in the household with the patient. While this study provided general information about families of elderly CABGS patients, the small number of unmarried participants limits the generalizability of findings. Results of the study suggest, however, that family stressors and factors affecting family adaptation extend beyond the immediate household of CABGS patients and may include adult children, grandchildren, and other extended family members. Many instruments that measure family variables are designed to assess family members living in the same household and, therefore, may not be reflective of family situations of older CABGS patients.

In addition to sociodemographic characteristics, hospitalization and procedural characteristics of the sample were examined. The CRS score was measured as an indicator of patient acuity prior to surgery. Analysis indicated that 79.3% of participants were at low risk for postoperative morbidity and mortality, 17.2% of participants were at increased risk, and 3.4% were at high risk. In a study evaluating the validity and reliability of the CRS in CABGS patients, Tuman et al. (1992) found 79.3% of CABGS patients to be at low risk, 21.6% at increased risk, and 4.3% at high risk. Comparatively, more participants in the current study were at low risk, with fewer participants at increased or high risk for postoperative morbidity and mortality. The sample in the study by Tuman et al. included participants who had valve surgery and concurrent procedures with the CABGS. The current study excluded these patients, which may have contributed to the lower risk.

The majority of participants were hospitalized either the day before or the day of surgery and spent one day in the ICU following surgery. The average PLOS for partici-

pants in this study was 4.74 days (SD = 1.74). This PLOS is shorter than that in the findings of Deaton et al. (1998), who reported a mean PLOS of 5.9 days (SD = 6) following CABGS. Other studies have reported PLOS for older patients ranging from 8.33 to 18 days (Artinian, 1993; Busch et al., 1999; King et al., 1992). The ICU LOS in the current study also was shorter than previously reported. In a study by King et al., women between the ages of 65 and 69 had a mean PLOS of 9.9 days and a mean ICU LOS of 3.05 days. These averages increased for women between the ages of 70 and 74 with an average PLOS and ICU LOS of 11.54 and 3.76 days, respectively (1992). This difference may be due to participants in the current study having fewer comorbidities and surgical risks that would complicate recovery and thereby increase both ICU LOS and PLOS. Additionally, changes in intraoperative and postoperative management of CABGS patients since these earlier studies were conducted may account for the shorter ICU and postoperative LOS. However, findings of this study support the reported trend of shorter PLOS and earlier discharge.

While a little over 26% of the participants had this surgery as an elective procedure, the remaining had either an emergent or urgent procedure. Participants who had an urgent procedure had a significantly longer ICU and postoperative length of stay in the hospital than participants undergoing an elective or emergent procedure. Clinical risk scores also were significantly higher for patients undergoing an urgent procedure compared to those experiencing an elective or emergent procedure. These findings suggest that patients having urgent CABGS were, in general, "sicker," thus contributing to both the longer ICU and postoperative length of stay. The findings support the relationship between higher patient acuity and increased ICU LOS and PLOS found by other researchers (Cowper et al., 1997; Johnson & McMahan, 1997; Nickerson et al., 1999). Re-

sults of the current study indicate that undergoing an urgent procedure also may contribute to a longer ICU and postoperative LOS. Additional information is needed about differences in the psychological well-being of elderly CABGS patients who have elective versus urgent procedures and the effects on family stressors.

The relationship between demographic, hospital, and procedural characteristics and the study variables of the pile-up of demands, family adaptation, and psychological well-being also were examined. No gender differences were found for family stress, family adaptation, or psychological well-being. Conflicting findings are reported concerning the relationship between gender and postoperative psychological well-being. For this study, differences in mental health scores approached significance, with males reporting better mental health than females. This finding is similar to those of Burker at al. (1995), who found that women experienced more problems with depression and other mood disturbances compared to men. However, other researchers have reported that men have more negative emotional responses during recovery (Moore, 1995; Rankin, 1990). Barnason et al. (2000) reported no association between gender and psychological well-being following CABGS. Various time frames, instrumentation, and methodologies used for data collection may account for differences in findings. While Barnason et al. (2000) used the MHI-5 scale used in this current study, data were collected at 3, 6, and 12 months after surgery, compared to 3 weeks after surgery in this study. Moore and Rankin used different instruments to assess psychological well-being, and Moore used a qualitative methodology. Previous studies, as with this study, had a greater proportion of males than females composing their samples, making it difficult to draw conclusions regarding the relationship between gender and patient psychological well-being during recovery following CABGS.

No significant relationship was found between the urgency of the procedure and scores on the FILE or FACES II. Additionally, no relationship was found between patient psychological well-being and whether a patient had a cardiopulmonary bypass procedure or an "off-pump" procedure. This finding supports the results of another study that found no difference between "off-pump" and conventional CABGS concerning quality of life outcomes (Puskas et al., 2004).

No significant relationship was found between the CRS score and other study variables, including psychological well-being. These findings support those of Barnason et al. (2000) but differ from the results of Burker et al. (1995), who found that comorbidities were significantly related to the occurrence of postoperative depression in CABGS patients. Different comorbidities were assessed in each of these studies, however, making comparisons difficult. Results of this current study need to be interpreted cautiously due to a lack of variability in CRS scores. The conflicting findings suggest that further assessment of the relationship between comorbidities, illness-severity, and psychological well-being, particularly in the elderly, is needed. Assessment of comorbidities in this study was limited to those measured by the CRS. Additional research is needed with a more comprehensive evaluation of the relationship between comorbidities and psychological well-being.

The characteristics of the sample may have affected findings of the study. The homogeneity of the sample related to gender and ethnicity, as well as economic status and education, limit the generalizability of any findings to different populations. However, findings of this study provide information about characteristics of an understudied but growing population of elderly CABGS patients and their families.

Instruments

FILE. The FILE was used to assess the pile-up of family demands. Internal consistency for the FILE was strong, as evidenced by Cronbach's alpha of .82. This reliability is consistent with other alpha reliability coefficients reported for other studies using the FILE, including a study of CABGS patients (Artinian, 1991; McCubbin et al., 1996). The internal consistency reliabilities of the subscales, measured by Cronbach's alpha, ranged from .12 to .70. The variations in subscale alpha reliabilities are similar to previously reported subscale reliabilities that varied from .30 to .73. The range in internal consistency of the subscales is attributed to the wide variance in frequency of occurrence of the individual stressors (1996). The overall alpha reliability of the FILE indicates that the total scale is a reliable measure of family stressors for elderly CABGS patients.

The FILE measures 71 family stressors. For this study, the mean number of stressors reported by participants 3 weeks after discharge was 8.2. In an earlier study by Artinian (1991), spouses of CABGS patients reported an average of 7.6 family stressors 6 weeks after surgery. Despite the differences in respondents and the time frame for data collection, participants in the study by Artinian, as well as the current study, reported a relatively low number of stressors when compared to the possible 71 stressors assessed by the FILE. Despite the apparently low number of family stressors, the national norm for number of stressors is 8.8 (McCubbin et al., 1996). While this indicates that participants in this study had somewhat fewer than normal reported stressors, comparisons must be made cautiously. The normative mean of 8.8 is based on individuals across the life span. Normative data regarding the number of stressors experienced specifically by elders is not available. The use of convenience sampling may have contributed to selection bias.

Additionally, inclusion criteria may have excluded participants experiencing more family stressors.

To further assess the pile-up of demands, an adjusted score for each participant was determined and compared to available normative data. The adjusted score was calculated by totaling standard weights for each family stressor. The mean normative adjusted stress score for families in the "Retirement" stage is 395. This normative score is lower than for families in other developmental stages. The mean adjusted family stress score for this sample was 347, slightly lower than the norm. Normative scores also have been established for low, moderate, and high stress levels (McCubbin et al., 1996). Despite a lower norm mean score, the majority of participants in this study were experiencing a moderate level of family stress. Three participants (7%) were experiencing low family stress levels, and 11.9% were experiencing high family stress levels.

Previous studies examining family stressors experienced by CABGS patients have focused on illness-related stressors: waiting for surgery, the hospital environment, and family responses to the surgery (Artinian, 1989; Cozac, 1988; Gillis, 1984; Laneluddecke et al., 1989). Unaddressed has been the role of normative and other concurrent, non-illness related stressors. The FILE was used in this study to identify what other types of family stressors elderly CABGS patients may be experiencing. Two of the most frequently reported individual stressors by participants in this study were illness-related, thus supporting the importance of these types of stressors. Two other most frequently reported individual stressors were related to family developmental stage, thereby supporting the occurrence of normative stressors. The final two stressors that were reported most frequently were related to work-family transitions and finance and business strains.

An examination of the FILE subscales also supports the findings of the most frequently reported individual stressors. The most frequently reported types of stressors by subscale were those related to work-family transitions and strains, followed by illness and family care strains and finance and business strains. The frequency of work-family strains may be a further reflection of the broader definition of family by participants in the study. While most of the participants were retired, the work-family stressors were often related to family members outside the household. As would be expected due to the family developmental stage, the least frequently reported types of stressors were pregnancy and childbearing strains and family legal violations.

The responses to the FILE provide information about types of family stressors elderly CABGS patients and families may be experiencing. Unknown is whether there are other family stressors not measured by the FILE. Further information is needed about other potential illness-related family stressors. The FILE assesses whether illness-related family strains had occurred (i.e., "Close relative or friend of the family became seriously ill") but does not assess specific types of family stressors associated with illness (e.g., family conflict, financial concerns, etc.).

FACES II. FACES II was used as a measure of family adaptation. The instrument was administered to participants via telephone 3 weeks after discharge. As with all of the study instruments administered over the telephone, a copy of the FACES II was sent to participants prior to the interview to facilitate ease of response.

Overall internal consistency reliability of the scale was Cronbach's alpha .78. The cohesion and adaptability subscales had internal consistency alphas of .56 and .69, respectively. These alpha reliabilities are lower than other published studies (i.e., total

scale, .90; cohesion, .87; and adaptability, .78) (Olson et al., 1992), indicating that the FACES II may be a less reliable measure of family adaptation for elderly CABGS patients than for other populations. No other published studies were found in the literature using the FACES II with this population.

Lower reliability coefficients could be attributed to instrument format, administration techniques, and lack of variability in responses by participants in the study. While participants expressed no difficulty overall with answering the items for the FACES II, several individual items posed potential problems. Items asking about family discipline were often questioned by respondents. Participants who lived alone also, at times, had difficulty answering some questions. While a respondent that lived alone may have reported "almost never" gathering in the same room, the response was not necessarily a reflection of decreased family cohesion but rather of situational circumstances. Administration techniques also may have affected internal consistency reliability. The FACES II was designed to measure family adaptation as perceived by a variety of family members. In this study, the FACES II was administered to only one family member, the patient. The use of individual scores may not measure family adaptation in the same manner as scores of multiple family members. Additionally, the homogeneity of the FACES II scores may have contributed to the decreased alpha reliability. FACES II scores indicated that most participants in this study perceived their family as highly flexible and very cohesive with very few participants representing poorer family adaptation.

A total score for family adaptation was determined by summing the cohesion and adaptability subscale scores. The total score had a possible range of 30 to 150. For this study, scores ranged from 80 to 142, with higher scores indicating increased family adaptation. Cohesion scores ranged from 36 to 78 ($M = 63.40$; $SD = 9.67$); adaptability scores

ranged from 39 to 65 ($M = 53.21$; $SD = 6.65$). By comparison, a study of families of patients with schizophrenia reported somewhat lower scores for cohesion and adaptability, means of 58.2 and 46.3, respectively (Saunders, 1999). A study of parents with children with asthma reported mean cohesion and adaptability scores slightly higher than this study: 69.41 and 50.41. No studies of CABGS patients were found for comparison.

To assist with interpretation of the total score as well as the subscale scores, a family type was determined using procedures recommended by Olson et al. (1992). Cohesion scores indicated participants in this study ranged from "disengaged" to "very connected." Most participants were "connected" or "very connected," indicating a high degree of emotional bonding among family members. Adaptability scores indicated participants ranged from "rigid" to "very flexible." Only one participant had a score indicating family type as "rigid." Most participants had scores indicating their family was "very flexible."

Based on cohesion and adaptability scores, four overall family types are identified: extreme, midrange, moderately balanced, and balanced (Olson et al., 1992). The majority of participants in this study would be considered "balanced." Balanced family systems are generally considered to have optimal family functioning.

No differences in FACES II scores were found based on gender or marital status. However, examination of cohesion and adaptability subscale scores found that participants who were married had a significantly higher adaptability scores than those who were not married. The lower family adaptability scores for unmarried participants may be a reflection of living alone and not having to alter one's lifestyle due to other family members. However, the lower adaptability scores for unmarried participants may also be due to a limitation of the FACES II in assessing family adaptability for individuals who

are not married. Many items of the FACES II measuring family adaptability are inappropriate for an individual who is unmarried or lives alone (e.g., "We shift household responsibilities from person to person").

Interpretation of findings from the FACES II provides information about two dimensions of family adaptation: cohesion and adaptability. Results suggest that elderly CABGS patients perceive a high level of cohesiveness and are very flexible.

MHI-5. Psychological well-being was measured using the MHI-5. The alpha reliability coefficient of the MHI-5 was .83. This alpha coefficient is consistent with previous reports. Internal consistency of the MHI-5 scale using Cronbach's alpha in previous studies has ranged from .81 to .95 (Ware et al., 2000).

The range of possible scores for the MHI-5 is 0 to 100; the range of scores for participants in this study was 28 to 92 ($M = 63.05$; $SD = 17.46$), with higher scores indicating better mental health. When compared to national norms reporting that the mean mental health score for individuals between the ages of 65 and 74 years was 76.87 ($SD = 18.08$), participants in this study had somewhat poorer mental health (Ware et al., 2000). While the normative data was determined from a large sample of individuals with a variety of medical diagnoses, the MHI-5 has also been used with CABGS patients. In one such study, MHI-5 scores for CABGS patients ranged from 60 to 84 (Sauer et al., 2001). This current study has a much wider range in scores but comparisons must be made cautiously. In the study by Sauer et al., the MHI-5 was administered 6 weeks postoperatively versus 3 weeks postoperatively in this study. Deaton et al. (1998) reported a mean mental health score of 67 ($SD = 27$), while the CABGS patient was in the hospital and a mean score of 72 ($SD = 22$) 3 months later. Barnason et al. (2000) reported a mean score of

81.77 (*SD* = 12.92) for CABGS 3 months after surgery. These findings imply that the psychological well-being of elderly CABGS patients at 3 weeks after surgery is similar to that while in the hospital. By 3 months after surgery, patients experience improvement in psychological well-being.

As recovery progresses, negative emotions tend to decrease (King & Parrinello, 1988; Moore, 1994; Timberlake et al., 1997). The timing of data collection in this current study may not have captured the postoperative time period when mood alterations are most prevalent. While previous research has found that depression and mood alterations are of most concern during the first 3 weeks after discharge (King & Parrinello, 1988; Moore, 1994), changes in the surgical procedure, postoperative management, and earlier discharge may have affected this time frame.

Bodily Pain. Bodily pain was assessed as a potential factor influencing psychological well-being. For this study, scores for bodily pain at 3 weeks after discharge ranged from 22 to 100, with a score of 100 indicating no pain or limitations due to pain. The mean score was 58.9 (*SD* = 20.54). The findings of the current study indicate, as would be expected due to the surgery, that participants had more pain and limitations due to pain than the national sample on which the instrument was normed. The national norm for the general population for individuals between the ages of 65 and 74 years is a mean of 68.49 (*SD* = 26.42). Normative data for frequency distribution of transformed bodily pain scores indicates that about 79.5% of the population scored higher than the mean score for this study, suggesting that elderly CABGS patients experience more pain and limitations due to pain than the general population.

Results of the current study of CABGS patients are similar to those of Deaton et al. (1998), who reported mean bodily pain scores of 58 ($SD = 28$) for CABGS patients while still in the hospital and 69 ($SD = 27$) 3 months after discharge. While the sample of patients in the study by Deaton et al. was not limited to patients over the age of 65, the bodily pain scores for the current study are similar to the baseline scores obtained by Deaton et al. While the two studies differed in sample age and the time of the assessment of pain, results of the current study indicate that bodily pain and activity restriction due to pain at 3 weeks after discharge is similar to that experienced by patients while still in the hospital.

Results of the assessment for bodily pain indicate that participants in this study were experiencing a significant amount of pain and/or limitations compared to the general population. However, during data collection, when participants were asked to rate their pain level, most verbally expressed their surprise at having little or no pain. The second question on the assessment tool asked about activity limitations due to pain. Many participants verbally expressed to the researcher that any limitations were more related to fatigue or physician orders.

Instrumentation Issues. Several potential problems were noted in the instruments and methods of administration used in this study. Administration techniques may have influenced participant responses. Copies of all instruments were sent to participants prior to the telephone interview with instructions not to read the questions prior to the interview. Despite this instruction, some participants may have read the questions prior to the interview, thereby giving them additional time to think about their answers. Responses may have differed from participants who did not see the questions prior to the interview.

As described in the methodology, instruments were administered only to patients; therefore, responses given were reflective of the patient's perception. It is unknown how, or if, responses would differ from other family members.

Environmental and personal factors may also have affected responses to the surveys. Participants were always asked how they were feeling and if it was "still a good time" prior to starting the interview and were offered the opportunity to reschedule for another time if needed. However, participants may have responded to the questions when they were not feeling well or had other distractions in the home. They may have answered the questions differently in a different environment.

Clarity and sensitivity are potential limitations of the instruments used in this study. The sensitivity of the instrument to detect variations when measuring variables of family stress, family adaptation, and the psychological well-being of elderly CABGS patients may account for the lack of variability in participant responses.

Response bias is a potential limitation. The sensitive nature of many of the questions may have directed participants to respond in what they perceived as a socially acceptable manner. Administration of the instruments via telephone may have contributed to response bias. A more anonymous method of answering the questions, such as returning the completed questions by mail, may have elicited different responses from participants.

Hypotheses

Hypothesis 1. It was hypothesized there would be a negative relationship between a pile-up of demands and family adaptation. The null hypothesis was that there would be no relationship between a pile-up of demands and family adaptation. Based on data

analysis, the null hypothesis was not rejected. No significant relationship was found between a pile-up of demands and family adaptation.

The results of this study differ from previous findings which found that the accumulation of stressors can have a negative effect on family adaptation (Bristol, 1987; Fink, 1995; Leske & Jiricka, 1998; Lavee et al., 1987; Stephenson, 1999). Several factors may account for the nonsignificant findings of this study.

A lack of variability in responses to the FILE and FACES II may have affected the results of hypothesis testing. While the mean number of stressors experienced by participants in this study was consistent for the "retirement" family, the narrow range of family stressors makes it difficult to determine how, or if, the relationship between a pile-up of demands and family adaptation would differ for families with high levels of family stress. Scores for family adaptation indicate that most participants had a "balanced" family type. It is unknown whether the relationship between a pile-up of demands and family adaptation would differ for families with "extreme" or "mid-range" family types.

A moderate negative relationship was found between family cohesion and the intrafamily strains subscale of the FILE ($r = -.38$; $p = .01$). Lavee et al. (1987) found that intrafamily strains, more than individual stressors, affected family well-being. Consideration needs to be given to whether the type of stressors, rather than the number of stressors, may influence family adaptation.

While previous studies found a negative relationship between a pile-up of demands and family adaptation, comparisons must be made cautiously. While the FILE has been used as a measure of family stress for a variety of populations, only one previous study was identified where the FILE was used as a measure of family stress for CABGS patients and families (Artinian, 1992). Earlier studies of family stress and CABGS pa-

tients were qualitative studies focused on illness-related stressors. The FILE may not reflect the same type of family stressors as other measures, particularly illness-related stressors. Measures of family adaptation vary greatly among studies found in the literature and include the Family Apgar (Fink, 1995; Hilbert, 1996), Family Adaptation Scale (Leske & Jiricka, 1998), Family Well-being Assessment Scale (Leske & Jiricka, 1998), and Quality of Life Scale (Lavee et al., 1987). The FACES II measures dimensions different from other tools used to measure family adaptation. The FACES II, for example, assesses family adaptability and cohesion, while the Family Apgar assesses partnership, growth, affection, and resolve as dimensions of family adaptation (Sawin & Harrigan, 1995).

No other studies examining the relationship between family stress and family adaptation for CABGS patients and families were found in the literature. Previous studies have focused on families with young children or caregivers. The nature of the illness in these studies is chronic illness. Illness characteristics for CABGS are more acute and time-limited than seen in chronic illness. Similarly, no reports examining family stress in elderly CABGS patients were found. Previous studies examining the relationship between family stress and adaptation focused on younger, more traditional families. Perception of family stress and adaptation may vary for older family members.

While the research hypothesis was statistically not supported, the direction of the relationship between a pile-up of demands and family adaptation was as predicted by the conceptual framework. Further study is needed about the relationship of these variables in elderly CABGS patients. Questions to be explored include the relationship between a pile-up of demands and family adaptation in less cohesive and flexible family types, and

the relationship between family stress and other dimensions of family adaptation not assessed by the FACES II.

Hypothesis 2. Hypothesis 2 stated that there would be a positive relationship between family adaptation and psychological well-being. The null hypothesis was that there would be no relationship between family adaptation and psychological well-being. Based on data analysis, the null hypothesis was rejected. A significant positive relationship was found between family adaptation and psychological well-being ($r = .32$; $p = .04$). According to Cohen (1988), a correlation of .30 suggests a moderate relationship between family adaptation and psychological well-being.

The findings of the current study support those of previous research with different populations, including caregivers of the elderly (Carruth et al., 1997), families of patients with schizophrenia (Saunders, 1999), and families of patients experiencing myocardial infarctions (Hilbert, 1996). Results of this study differ from a study by Drory and Florian (1991), who found no relationship between family adaptation and psychosocial adjustment to illness in patients with coronary artery disease and their families. With the exception of the study by Hilbert (1996), the aforementioned studies, similar to this study, used the FACES II as a measure of family adaptation. All of the studies, however, used different measures of patient psychological well-being. Drory and Florian used the PAIS, which measures a variety of psychosocial factors related to illness The other studies used instruments such as the Affects Balance Scale that more specifically examined mood and morale. The different instrument used by Drory and Florian may account for the discrepancies in findings.

As discussed previously, a comparison of the results from this study with earlier research must be made cautiously because of variations in study populations, instruments, and the time frames of data collection. Previous studies primarily focused on patients and families experiencing chronic illness. The time frames of data collection reflected the long-term adjustment associated with chronic illness versus the acute response that was the focus of this study. The variety of measures of psychological well-being used in earlier studies examining the relationship between family adaptation and psychological well-being also makes comparisons difficult. Despite these limitations, results of this study seem to support the findings of previous research of the positive relationship between family adaptation and psychological well-being.

Hypothesis 3. The third hypothesis stated there would be a negative relationship between a pile-up of demands and psychological well-being. The null hypothesis tested was that there would be no relationship between a pile-up of demands and psychological well-being. As determined by data analysis, no relationship was found between a pile-up of demands and psychological well-being.

No published studies examined the relationship between a pile-up of demands and psychological well-being of CABGS patients and their families. The conceptual model hypothesized that as the pile-up of demands increased, psychological well-being would decrease. Results of this study, while statistically nonsignificant, do support the direction of the relationship. A lack of significant findings may be due to selection bias and the lack of variability in participant responses to study instruments. Patients who agreed to participate may differ from those patients that did not participate in the degree of psychological well-being and number of family stressors.

Hypothesis 4. The fourth hypothesis stated that family adaptation would be a mediating variable between a pile-up of demands and psychological well-being. The null hypothesis tested was that family adaptation would not mediate between a pile-up of demands and psychological well-being. Findings of data analysis indicated that family adaptation had no mediating effects between a pile-up of demands and psychological well-being.

A mediating variable alters the association between an independent variable and a dependent variable. The conceptual model for this study hypothesized that family adaptation was a mediating variable between the pile-up of demands and the psychological well-being of the CABGS patient. In order for a mediation effect to exist, a significant relationship must exist between the independent and dependent variable (Bennett, 2000). As discussed in hypothesis 3, no significant relationship was found between the pile-up of demands and psychological well-being.

Despite the nonsignificant relationship between a pile-up of demands and psychological well-being, a regression analysis was done to follow through with the statistical procedures used to determine whether a variable has a mediating effect. Variables entered in the regression model were the dependent variable of psychological well-being and the independent variables of a pile-up of demands, family adaptation, bodily pain, and clinical risk. The regression model accounted for 15 % ($R^2 = .154$) of the predicted variance in psychological well-being; however, the adjusted R^2 indicated that for this sample, the predictor variables accounted for only 6% of the variance (adjusted $R^2 = .063$). The difference between the R^2 and adjusted R^2 may be due to the small sample size. The poor fit of the model to predict the dependent variable of psychological well-being is further confirmed by ANOVA. The residual sum of squares was larger than the regression sum of

squares, indicating that the model fails to explain a lot of variation in the dependent variable ($F(4, 42) = 1.69$; $p = .173$).

Conceptual Framework

The conceptual framework for this study was derived from the Double ABCX model of family stress (McCubbin et al., 1996). The Double ABCX model incorporates both precrisis and postcrisis family variables hypothesized to influence family adaptation to a potential crisis situation. According to the Double ABCX model, family adaptation to a potential crisis event is dependent upon the pile-up of demands, available family resources to meet demands, and perceptions of families of the situation. For the current study, the model was adapted to examine the relationship between the pile-up of demands, family adaptation, and psychological well-being of elderly CABGS patients. From the modified conceptual framework, a pile-up of family demands was hypothesized to negatively impact both family adaptation and patient psychological well-being. Additionally, family adaptation was hypothesized to have a positive relationship with patient psychological well-being. The final hypothesis theorized that family adaptation would mediate the impact of a pile-up of demands on patient psychological well-being.

The results of this study partially supported the conceptual model. The hypothesized negative relationship between family adaptation and psychological well-being of elderly CABGS patients was supported. However, the hypothesized relationship between a pile-up of demands and family adaptation was not supported. Similarly, no significant relationship was found between a pile-up of demands and psychological well-being.

Several factors may have contributed to these findings, including the sample characteristics and instrumentation issues discussed previously. The low number of family

stressors experienced by participants in this study, the lack of variability in family adaptation scores, and the scores of psychological well-being may account for the non-significant relationship between the pile-up of demands and family adaptation and psychological well-being. The relationship between intrafamily strains (a subscale of the FILE) and family adaptation does support findings of other researchers.

A hypothesis based on the conceptual framework was that family adaptation mediates the relationship between a pile-up of demands and psychological well-being. The lack of a significant relationship between the two variables precluded further evaluation of family adaptation as a mediator. Whether or not these findings are a result of instrumentation issues, sample characteristics, or incorrect conceptualization of the relationship among the variables is unknown.

Unlike previous research using the Double ABCX, the conceptual framework for this study included patient psychological well-being as an outcome variable. While earlier research has examined the relationship between a pile-up of demands and family adaptation on the physical and emotional well-being of family members of patients, no studies were found in the literature that specifically examined the relationship to patient psychological well-being. Results of this study supported the hypothesized positive relationship between family adaptation and patient psychological well-being.

The conceptual model for this study excluded some constructs that are part of the Double ABCX, including family resources and family perception of the situation. Because these constructs were not assessed as part of this study, it is unknown how, or if, family resources may have influenced the relationship between a pile-up of demands and family adaptation or psychological well-being. The event of CABGS may not have been perceived as a potential crisis event by the patient, thus affecting the findings of the

study. The Double ABCX model recognizes that family responses to a crisis event evolve over time (McCubbin & Patterson, 1983). The methodology of this study did not include assessment of family stressors, family adaptation, or psychological well-being prior to the CABGS. Any change in these variables, therefore, could not be determined.

Comparisons with previous research testing the Double ABCX model are difficult. A review of the literature found various interpretations of the model. Operational definitions of the model constructs also have varied greatly. This is most evident in the variety of instruments used to measure "family adaptation," Evaluation of the reliability and validity of current family instruments as measures of family characteristics in less traditional family structures is needed to ensure more testing of the conceptual framework for this study.

An assumption of this study was that patient self-reports of family stressors and family adaptation reflect the family unit; however, the use of individual-level data may have limited evaluation of the conceptual model. Individual-level data reflects the perception of one family member (in this study, the patient). Further testing of the model using relational or transactional-level data may provide increased understanding of the relationship among the variables.

Study Limitations

1. The use of convenience sampling increases the risk for selection biases and increases the risk that confounding variables will influence findings. The racial and gender disparity of the study population may also limit the generalizability of findings.

2. A power analysis estimated a needed sample size of 50 subjects. Data collection was terminated with a sample size of 42. Due to the lack of variability in participant responses to study instruments, data results would be unchanged with the larger sample size.
3. Limitations of this design include self-selection and findings that may result from one or more unobserved variables
4. Participant characteristics may influence findings. Demographic and procedural data were collected and reported. Clinical risk and bodily pain were identified as covariates in testing the study hypotheses. Findings may be influenced by participant characteristics not identified or used in statistical analysis.
5. The FILE, FACES II, and MHI-5 are self-report instruments. Concerns related to a self-report instrument include reporting biases. Social desirability response bias may be of particular concern with the FILE and FACES II, as respondents may have been reluctant to disclose information about specific types of strains or behaviors. Responses to the FILE and FACES II were obtained from one family member, the patient. Perceptions of other family members may differ from that of the CABGS patient. In addition, the FILE was developed to reflect overall family life events and changes that create strain within a family. The FILE may not reflect demands specific to CABGS recovery. The Likert scale used in FACES II may support extreme responses on the part of the respondent.
6. Family adaptation is a very broad concept that incorporates many dimensions. Measurement of family adaptation by FACES II is limited to the dimensions of family cohesion and adaptability. Other dimensions of family adaptation not addressed by this study may influence patient recovery following CABGS.

7. Limitations of the MHI-5 are similar to those previously discussed related to the FILE and FACES II. Additionally, recognition must be given to the fact that the MHI-5 is an assessment of only one phenomenon related to health. Many other dimensions of health that are altered during recovery from CABGS are excluded.
8. Responses to the instruments used in this study provided individual-level data. Data were collected from one family member, the patient, and therefore do not reflect perceptions of other family members.
9. A cross-sectional design was used for the study, so data were collected at only one point in time. Data were collected approximately 3 weeks after discharge. The responses of CABGS patients prior to, or following, that time period is not known.

Conclusions

Based on the findings and preceding discussion, the following conclusions are made:

1. There was a positive relationship between family adaptation and the psychological well-being of elderly CABGS patients participating in this study, even in this convenience sample with few family stressors.
2. No significant relationship was found between a pile-up of demands and family adaptation or the psychological well-being of elderly CABGS patients participating in this study.
3. Family adaptation was not a mediating variable between a pile-up of demands and the psychological well-being of elderly CABGS patients participating in this study.

4. The conceptual model based on the Double ABCX Model of Family Stress has potential implications for understanding the relationship between family stress, family adaptation, and psychological well-being.
5. Elderly CABGS patients in this study experienced a moderate level of family stress as assessed by the FILE despite questions regarding whether the FILE adequately assesses family stressors for this developmental stage.
6. Elderly CABGS patients in this study experienced poorer mental health compared to a normative population as measured by the MHI-5.
7. Participants in this study perceived their family functioning as "balanced," highly flexible, and very cohesive as measured by the FACES II.
8. Elderly CABGS patients undergoing an urgent procedure experienced decreased postoperative psychological well-being compared to patients having an elective or emergent procedure, as assessed by the MHI-5.
9. Elderly CABGS patients in this study were able to identify specific individuals as their family. Their family may or may not live in the same household with the patient.

Implications

Implications for Nursing Research

As the number of older individuals undergoing CABGS continues to increase, a greater understanding of the impact of illness and recovery on patients and families is needed. Results of this study indicate that elderly patients experience a moderate level of family stress. Further research is needed to identify the types of family stressors most likely experienced by older CABGS patients.

Findings of this study indicate a relationship between family adaptation and psychological well-being. Further understanding of this relationship may aid in the development of interventions to support patients and families following CABGS. Patients in this study perceived that their families functioning as "balanced." Additional research is needed to determine if the relationship between family adaptation and psychological well-being is different for families with of different types (i.e., extreme, midrange, and moderately balanced).

Research to validate family measures with older families is needed. As the number of individuals over the age of 65 continues to increase, there is an increasing need to better understand the relationship between family and response to illness for this population. Specific issues that need to be considered related to instrument development or modification for this population include the following:

1. Further evaluation of the internal consistency reliability of current family instruments with less traditional family structures, including older families.
2. Evaluation of the content validity of current family instruments with less traditional family structures, including older families. Many current family instruments, including the FILE and FACES II, were developed two decades ago using data from families across the life span that may underrepresent the current demographics of older adults. Research is needed to determine if the content of current family instruments remains appropriate for less traditional, nuclear families.
3. Development of strategies for gathering relational and transactional level data from less traditional families, including older families. Relational data, used for family-related research, are gathered from multiple family members and combined in some manner to describe some aspect of the family. Transactional data,

more appropriate for family research, are obtained from the functioning of the family unit (Feetham, 1991). Data obtained for this study, similar to much family-related research, are individual-level data. Additionally, participants in this study frequently defined their "family" to include individuals beyond their household. Research is needed to identify strategies for obtaining different levels of family data.

4. Determination of family constructs relevant to less traditional families, including older families. Comparisons of results of family studies are difficult, in part, because of the variety of instruments available to measure such constructs as family adaptation. More information is needed about whether there are family constructs more reflective of family functioning in a less traditional family structure.
5. Instruments to assess illness-related family strains also are needed, particularly for less traditional families.

Further testing of the conceptual model and the Double ABCX with this population could lead to an expansion of theory development related to family stress. Previous testing of the Double ABCX model of family stress has focused on families coping with chronic illness and families with children. Further evaluation of the conceptual model for this study could support expansion of family stress theory specific to older adults. With the addition of individual psychological well-being as an outcome variable, the model has the potential to increase understanding of how family stress affects individual family members during recovery from illness. Additional studies are needed to examine whether, and how, family adaptation affects the relationship between a pile-up of family demands and patient psychological well-being.

Implications for Nursing Practice

The American Association of Colleges of Nursing (AACN) (2000) has identified competencies for baccalaureate-prepared nurses to provide high-quality care for older patients and their families. These competencies include the provision of individualized care, the facilitation of transitions of patients between acute care facilities and home, and the application of evidence-based standards. Results from this study can aid practitioners in individualizing care by increasing their understanding of family stress for the older CABGS patient. Increased awareness of the type of stressors can aid practitioners in identifying patients and families at risk for problems after discharge.

Discharge planning can be enhanced by increased understanding of the relationship between family adaptation and psychological well-being. Family cohesion and flexibility may be additional resources that elderly CABGS patients and families can use to manage recovery at home. Families who are more cohesive and flexible may be more able to provide the physical and emotional support needed by the patient during recovery. Patients with families who are less cohesive or rigid may require additional discharge arrangements to provide the necessary support (i.e., visiting nurse). Findings from this study may assist in the development of standards of care for elderly CABGS patients. By incorporating measures of family stressors and family adaptation as part of nursing assessment of patients, individualized discharge plans can be developed to facilitate the transition from hospital to home.

Implications for Nursing Education

This study has implications for nurse educators. Educators are increasingly expected to incorporate more theoretical and clinical content related to the care of the older

adult. To increase student competencies in caring for older adults, curricula should include content related to family stress theory and the relationship between family and patient well-being. Curricula should include not only content related to individual growth and development but also family developmental stages. Students should be exposed to various instruments that assess family stress and adaptation and be encouraged to incorporate these tools in their practice.

Learning strategies should be developed that increase the comfort level of students in interacting with the families of patients. In the clinical setting, students can be given opportunities to interview families of patients about the impact of hospitalization of a family member on the family unit and to incorporate family-related nursing diagnoses and interventions when developing plans of care.

Recommendations

Based on the findings, conclusions, and implications, the following recommendations are made:

1. Replicate the study with an increased sample size and more diverse patient populations, including gender and ethnicity.
2. Conduct a study that includes both preoperative and postoperative assessment of family stress, family adaptation, and psychological well-being.
3. Replicate the study using a different, more comprehensive measure of co-morbidities and illness severity.
4. Investigate whether perceptions of family stress and family adaptation of other family members differ from the perceptions of elderly CABGS patients.

5. Conduct a study that incorporates an assessment of family perceptions of the crisis event and family resources in the conceptual model.

Summary

This descriptive correlational study was conducted to examine the relationships among family stress, family adaptation, and the psychological well-being of elderly CABGS patients. Results of data analysis were discussed. Conclusions drawn from the discussion were identified and recommendations made for further research.

Findings of this study indicated a moderate significant relationship between family adaptation and the psychological well-being of elderly CABGS patients. A pile-up of demands were found not to have a significant relationship to either family adaptation or psychological well-being. Findings of the study partially support the conceptual framework, based on the Double ABCX Model of Family Stress. Despite limitations, findings of this study have implications for nurse researchers as well as for nurse educators and practitioners.

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APPENDIX A

DATA COLLECTION INSTRUMENTS

FAMILY INVENTORY OF LIFE EVENTS (FILE)

	YES	NO	SCORE
I. Intrafamily Strains			
1. Increase of husband's time away from family			46
2. Increase of wife's time away from family			51
3. A member appears to have emotional problems			58
4. A member appears to depend on alcohol or drugs			66
5. Increase in conflict between husband and wife			53
6. Increase in arguments between parent(s) and child(ren)			45
7. Increase in conflict among children in the family			48
8. Increased in difficulty in managing teenage child(ren)			55
9. Increased difficulty in managing school age child(ren) (6- 12 yrs)			39
10. Increased difficulty in managing preschool age child(ren) (2.5 –6 yrs)			36
11. Increased difficulty in managing toddler(s) (1- 2.5 yrs)			36
12. Increased difficulty in managing infant(s) (0 –1 yrs)			36
13. Increase in amount of "outside activities" which the children are involved in			25
14. Increased disagreement about a member's friends or activities			35
15. Increase in the number of problems or issues which don't get resolved			45
16. Increase in number of tasks or chores which don't get done			35
17. Increased conflict with in-laws or relatives			40
II. Marital Strains			
18. Spouse/ parent was separated or divorced			79
19. Spouse/ parent had an "affair"			68
20. Increased difficulty in resolving issues with a "former" or separated spouse			47
21. Increased difficulty with sexual relationship between husband and wife			58
III. Pregnancy and Childbearing Strains			
22. Spouse had unwanted or difficult pregnancy			45
23. An unmarried member became pregnant			65
24. A member had an abortion			50
25. A member gave birth to or adopted a child			50

	YES	NO	SCORE
IV. Finance and Business Strains			
26. Took out a loan or refinanced a loan to cover increased expenses			29
27. Went on welfare			55
28. Change in conditions (economic, political, weather) which hurts the family investments			41
29. Change in agriculture market, stock market, or land values which hurts family investments or income			43
30. A member started a new business			50
31. Purchased or built a home			41
32. A member purchased a car or other major item			19
33. Increased financial debts due to over-use of credit cards			31
34. Increased strain on family "money" for medical/ dental expenses			23
35. Increased strains on family "money" for food, clothing, energy, home care			21
36. Increased strain on family "money" for child(ren)'s education			22
37. Delay in receiving child support or alimony payments			41
V. Work-Family Transitions and Strains			
38. A member changed to a new job/ career			40
39. A member lost or quit a job			55
40. A member retired from work			48
41. A member started or returned to work			41
42. A member stopped working for extended period (e.g. laid off, leave of absence, strike)			51
43. Decrease in satisfaction with job/ career			45
44. A member had increased difficulty with people at work			32
45. A member was promoted at work or given more responsibilities			40
46. Family moved to a new home/ apartment			43
47. A child /adolescent member changed to a new school			24
VI. Illness and Family "Care" Strains			
48. Parent/ spouse became seriously ill or injured			44
49. Child became seriously ill or injured			35
50. Close relative or friend of the family became seriously ill			44
51. A member became physically disabled or chronically ill			73
52. Increased difficulty in managing a chronically ill or disabled member			58
53. Member or close relative was committed to an institution or nursing home			44

	YES	NO	SCORE
54. Increased responsibility to provide direct care or financial help to husband's and/ or wife's parents			47
55. Experienced difficulty in arranging for satisfactory child care			40
VII. Losses			
56. A parent/ spouse died			98
57. A child member died			99
58. Death of husband's or wife's parent or close relative			48
59. Close friend of the family died			47
60. Married son or daughter was separated or divorced			58
61. A member "broke up" a relationship with a close friend			35
VIII. Transitions "In and Out"			
62. A member was married			42
63. Young adult member left home			43
64. Young adult member began college (or post high school training)			28
65. A member moved back home or a new person moved into the household			42
66. A parent/ spouse started school (or training program) after being away from school for a long time			38
IX. Family Legal Violations			
67. A member went to jail or juvenile detention			68
68. A member was picked up by police or arrested			57
69. Physical or sexual abuse or violence in the home			75
70. A member ran away from home			61
71. A member dropped out of school or was suspended from school			38

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FACES II

1 Almost Never	2 Once in Awhile	3 Sometimes	4 Frequently	5 Almost Always

_____1. Family members are supportive of each other during difficult times.

_____2. In our family, it is easy for everyone to express his/her opinion.

_____3. It is easier to discuss problems with people outside the family than with other family members.

_____4. Each family member has input regarding major family decisions.

_____5. Our family gathers together in the same room.

_____6. We are flexible in how we handle differences.

_____7. Our family does things together.

_____8. Family members discuss problems and feel good about the solutions.

_____9. In our family, everyone goes his/ her own way.

_____10. We shift household responsibilities from person to person.

_____11. Family members know each other's close friends.

_____12. It is hard to know what the rules are in our family.

_____13. Family members consult other family members on personal decisions.

_____14. Family members say what they want.

_____15. We have difficulty thinking of things to do as a family.

_____16. We have a good balance of leadership in our family.

_____17. Family members feel very close to each other.

_____18. Discipline is fair in our family.

_____19. Family members feel closer to people outside the family than to other family members.

1 Almost Never	2 Once in Awhile	3 Sometimes	4 Frequently	5 Almost Always

_____20. Our family tries new ways of dealing with problems.

_____21. Family members go along with what the family decides to do.

_____22. In our family, everyone shares responsibilities.

_____23. Family members like to spend their free time with each other.

_____24. It is difficult to get a rule changed in our family.

_____25. Family members avoid each other at home.

_____26. When problems arise, we compromise.

_____27. We approve of each other's friends.

_____28. Family members are afraid to say what is on their minds.

_____29. Family members pair up rather than do things as a total family.

_____30. Family members share interests and hobbies with each other.

Olson, D. H., McCubbin, H. I., Barnes, H., Larsen, A., Muxen, M., & Wilson, M. (1992). *Family Inventories*. Minneapolis, MN: Life Innovations, Inc.

MENTAL HEALTH INDEX-5 (MHI-5)

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
Have you been a very nervous person?	1	2	3	4	5	6
Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
Have you felt calm and peaceful?	1	2	3	4	5	6
Have you felt downhearted and blue?	1	2	3	4	5	6
Have you been a happy person?	1	2	3	4	5	6

Ware, J. E. (2000). *SF-36 Health Survey: Manual & Interpretation Guide*. Lincoln, RI: Quality Metric, Inc.

SOCIODEMOGRAPHIC DATA

1 NAME: _____ *(for medical record review only)*

ADDRESS _____ *(to mail questionnaire/gratuity)*

_____

PHONE: _____ *(to contact you for an interview)*

2 AGE: _____ **3 GENDER** Male ❑ Female ❑

4 FAMILY INFORMATION:

a. Who do you consider to be your family? _____

b. Number of family members living in home: _____

c. Relationship of family members living in home: Spouse ❑ Sibling ❑ Child ❑ Other ❑

d. What is your marital status? Married ❑ Never Married ❑ Widowed ❑ Divorced/Separated ❑ Living Together ❑

5 ETHNIC BACKGROUND: Asian ❑ African-American ❑ Hispanic ❑ Caucasian ❑

Other *(please specify)* _____ ❑

6 EDUCATIONAL LEVEL: No High School ❑ Some HS ❑ HS Graduate ❑ Some College ❑ College Degree *(associate/bachelor)* ❑ Graduate Degree ❑

7 ECONOMIC STATUS: *estimate annual household income* <14,999 ❑ 15,000-24,999 ❑ 25,000-34,999 ❑ 35,000-49,999 ❑ 50,000-74,000 ❑ >75,000 ❑

PROCEDURAL AND HOSPITAL DATA

_____ DATE OF SURGERY

_____ DATE OF TRANSFER FROM ICU

_____ DATE OF DISCHARGE

_____ NUMBER OF DAYS HOSPITALIZED PRIOR TO SURGERY

_____ ICU LENGTH OF STAY (DAYS)

_____ POSTOPERATIVE LENGTH OF STAY (DAYS)

SURGERY

- ☐ ELECTIVE
- ☐ EMERGENT
- ☐ URGENT

PROCEDURE

- ☐ WITH BYPASS
- ☐ OFF BYPASS

Other: _____

NUMBER OF GRAFTS _____

_____ CRS SCORE

CLINICAL RISK SCORING GUIDE

Criteria	Score	Patient
Emergency surgery	4	
Age 65 –74	1	
Age 75 or older	2	
Renal dysfunction	2	
Recent MI, last 3 –6 months	1	
Recent MI, < 3 months ago	2	
Female gender	2	
Reoperation	2	
Pulmonary hypertension	2	
Cerebrovascular disease	2	
Multivalve or CABGS + valve	2	
Mitral or aortic valve	1	
CHF	1	
LV dysfunction	1	

BODILY PAIN SUBSCALE

How much bodily pain have you had during the past three weeks?

None

Very mild

Mild

Moderate

Severe

Very severe

During the past three weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all

A little bit

Moderately

Quite a bit

Extremely

Ware, J. E. (2000). *SF-36 Health Survey: Manual & Interpretation Guide*. Lincoln, RI: Quality Metric, Inc.

APPENDIX B

INSTRUMENT PERMISSIONS

PERMISSION FOR THE FILE

UNIVERSITY OF HAWAII AT MANOA
School of Nursing and Dental Hygiene
Department of Nursing

June 7, 2002

Rhonda McLain, RN, MN.
2300 Country Walk, Apt. 422
Snellville, Georgia 30039-3967

Dear Ms. McLain: Manual #00 1093

This letter is to give you my written permission to use the FILE (Family Inventory of Life Events) in your dissertation research on the "Relationship between Family Stress, Family Adaptation and Psychological Well-Being of Elderly Coronary Artery Bypass Graft Surgery (CABGS) Patients during Early Recovery." Please note that because you are now a registered user of the above manual, you have permission to use any of the other instruments in the book as well. You may re-format the instruments (i.e., larger type, combine with other study instruments into a booklet, etc.) to suit the specific needs of your study and sample population too.

We would appreciate receiving an abstract of your research when it is completed for our files. You can mail to me at the address below as the previous Wisconsin address is no longer valid.

Best wishes to you on your research study.

Sincerely yours,

Marilyn McCubbin

Marilyn A. McCubbin, PhD, FAAN
Professor & Interim Associate Dean
University of Hawaii at Manoa
School of Nursing & Dental Hygiene
Webster Hall 403
2528 McCarthy Mall
Honolulu, Hawaii 96822
Phone: *808-956-5469*
FAX: 808-956-3257
e-mail: mccubbin@hawaii .edu

PERMISSION FOR FACES II

Permission to Use Family Inventories

I am pleased to give you permission to use the instruments included in the **Family Inventories Manual.** This Manual includes FACES II, Family Satisfaction, Parent-Adolescent Communication, Family Strengths, and Quality of Life. You may have my permission to duplicate these materials for your clinical work, teaching, or research project.

You can either duplicate the materials directly from the manual or have them retyped for use in a new format. If they are retyped, acknowledgements should be given regarding the name of the instrument, developers' names, and Life Innovations.

In exchange for providing this permission, we would appreciate a copy of any papers, thesis, or reports that you complete using these Inventories. This will help us in staying abreast of the most recent development and research with these scales.

In closing, I hope you find the **Family Inventories** of value in your work with couples and families. I would appreciate feedback regarding how these instruments are used and how well they are working for you.

David H. Olson

D David H. Olson, Ph.D.

AWARE PREPARE PREPARE-MC ENRICH MATE
Building Relationships Empowering Couples Coping & Stress Profile

Permission for SF – 36 (MHI- 5 and Bodily Pain)

License Agreement
Page 1 of 3

Rhonda McLain

LICENSE AGREEMENT
License Number: F1-022303-13080

This License Agreement is entered into, by, and between QualityMetric Incorporated (the "Licensor"), 640
George Washington Highway, Lincoln, RI 02865 and University of Alabama at Birmingham - School of
Nursing (the "Licensee"), 2300 Country Walk Apt 422, Snellville, GA, 30039, United States.

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  English (United (80 survey administrations

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- The SF-36® Physical and Mental Health Summary Scales: A Manual for User's of Version 1, Second Edition

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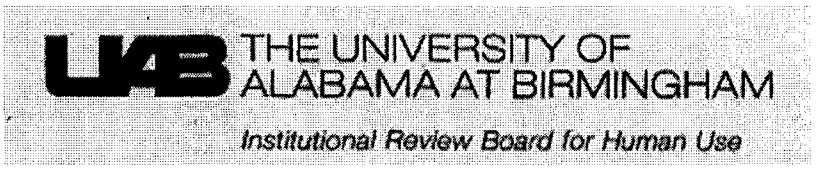
EXECUTED, as of the date set forth in the paragraph captioned Terms and Termination, by the duly authorized representatives as set forth below. By Executing this agreement, the Licensee represents that it is an organization that will only use the Licensed Survey(s) in the language(s) indicated above and according to the terms of this License to obtain data for un-funded scholarly research.

Rhonda McLain
2300 Country Walk Apt 422
Snellville, GA
30039
United States

APPENDIX C

INSTITUTIONAL REVIEW BOARD AND AGENCY APPROVALS

IRB APPROVAL FROM UNIVERSITY OF ALABAMA AT BIRMINGHAM



Form 4: IRE Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

The Institutional Review Board for Human Use (IRB) has an approved Multiple Project Assurance with the Department of Health and Human Services and is in compliance with 21 CFR Parts *50* and *56* and ICH GCP Guidelines. The Assurance became effective on January 1, 1999 and the approval period is for five years. The Assurance number is M-1149.

Principal Investigator: MCLAIN, RHONDA

Co-Investigator(s):

Protocol Number: **X021101007**

Protocol Title: *Relationship Between Family Stress, Family Adaptation, and Psychological Well-being of Elderly Coronary Artery Bypass Graft Surgery Patients*

The IRE reviewed and approved the above named project o 12-6-02 . The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date 12-6-02

Date IRB Approval Issued: 12-6-02

Marilyn Doss

Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

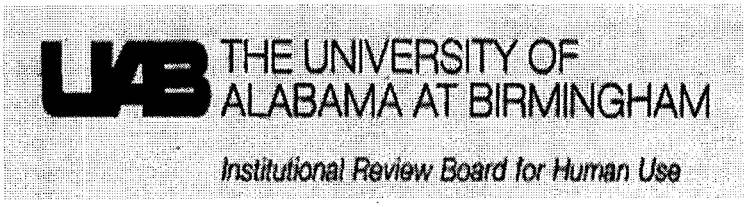
Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRE prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104

INSTITUTIONAL REVIEW BOARD RENEWAL



Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

The Institutional Review Board for Human Use (IRB) has an approved Multiple Project Assurance with the Department of Health and Human Services and is in compliance with 21 CFR Parts *50* and *56* and ICH GCP Guidelines. The Assurance became effective on January 1, 1999 and the approval period is for five years. The Assurance number is M-1 149.

Principal Investigator:	MCLAIN, RHONDA
Co-Investigator(s):	
Protocol Number:	**X021101007**
Protocol Title:	*Relationship Between Family Stress, Family Adaptation, and Psychological Well-being of Elderly Coronary Artery Bypass Graft Surgery Patients*

The IRB reviewed and approved the above named project on . The review was conducted in accordance with UAB's Assurance 12-08-03 ce approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date:

Date IRB Approval Issued: 12-08-03

HIPAA Waiver Approved?: NO 12-15-03

Review

Marilyn Doss

Marilyn Doss, M.A.
Vice Chair of the Institutional

Board for Human Use (IRB)

Investigators please note:

The IRE approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

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470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of
Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104

INSTITUTIONAL REVIEW BOARD APPROVAL: EMORY UNIVERSITY

EMORY UNIVERSITY | Institutional Review Board

Rhonda McLain MN

2300 Country Walk, Apt. 422
Snellville, GA 30039

RE: **NOTIFICATION OF PROTOCOL APPROVAL**
PI: Sandra B. Dunbar PhD/RN
IRB ID: **576-2003**
TITLE: Relationship between Family Stress, Family Adaptation, and Psychological Well-being of Elderly CABGS Patients
DATE: July25, 2003

The research proposal referenced above was reviewed and APPROVED under the Expedited review process. This approval is valid from 7/25/2003 until 7/24/2004. Thereafter, continued approval is contingent upon the submission of a renewal form that must be reviewed and approved by the IRB prior to the expiration date of this study.

Any serious adverse events or issues resulting from this study should be reported immediately to the IRB and to any sponsoring agency (if any). Amendments to protocols and/or revisions to informed consent forms/process must have approval of the IRB before implemented.

All inquires and correspondence concerning this protocol must include the IRB number and the name of the Principal Investigator.

If you have any questions or concerns, please contact the IRB office at 404-727-5646 or at email address irb@emory.edu. Our web address is http://www.emory.edu/IRB. Thank you.

Sincerely,

J. W. Keller

James W. Keller, MD
Chairman, Institutional Review Board

Emory University
4th Floor, South Wing
1256 Briarcliff Road
Atlanta, Georgia 30306
An equal opportunity, affirmative action university

Tel *404.727.5646*
Fax 404.727.1358
Email IRB@emory.edu

PAGE 2 of 2- PROTOCOL APPROVAL

This approval is valid from 7/25/2003 until 7/24/2004.
IRB ID: **576-2003** DATE: July *25,* 2003

The above referenced protocol was approved including the information below. Please review this information for accuracy. If there are any discrepancies, please notify the IRB office.

Informed Consents Associated with this protocol:

Version Date	Description
7/18/2003	Main

Personnel

Name	Position	Cert A	Cert B
	Other		
McLain, Rhonda	Co-Investigator		
Dunbar, Sandra B.	Main Investigator	A10001181	

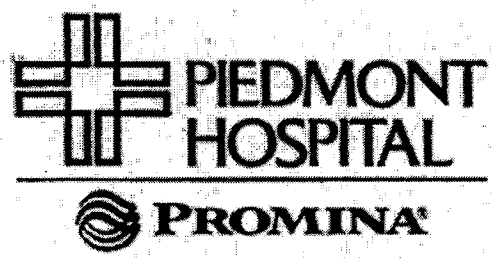
Number of Approved Emory Subjects 30

Sites
Emory University Hospital

Crawford Long Hospital

Funding Agencies
NOT FUNDED

AGENCY APPROVAL



March 21, 2003

Rhonda M. McLain, MN, RN
Assistant Professor of Nursing
Clayton College & State University

Dear Ms. McLain:

The Nursing Research Committee has reviewed your research proposal entitled "The Relationship between Family Stress, Family Adaptation and Psychological Well-being of Postoperative Elderly CABG Patients" and has approved data collection for your study at Piedmont Hospital.

Pam Cowart, RN, MSN, CCNS, NRC Chair or Marilyn Cushing, RNC, MSN, MBA, NRC Secretary will be your contact persons. They can serve as resource and liaison persons during your application process. Please feel free to contact them at 404-605-1732 or 404-605-2309 respectively.

We are pleased that you are considering using Piedmont Hospital as one of your sites for data collection and we do want you to share your results with us.

Best wishes to you in your research endeavor.

Sincerely,

Pam Cowart RN, MSN, CCNS

Pam Cowart, RN, MSN, CCNS
Nursing Research Committee Chairperson

APPENDIX D

STUDY RECRUITMENT BROCHURE

For more information,

contact Rhonda McLain

WOULD YOU CONSIDER...

WOULD YOU CONSIDER

Helping me and other nurses better understand how family stress and functioning might affect patient recovery after heart surgery?

Because of the type of surgery you have recently had, I would like to invite you to participate in a research study.

WOULD YOU CONSIDER GIVING SOME OF YOUR TIME?

If you agree to take part in this study, you will be asked to complete two interviews. The first interview will take about 15 minutes and will be done while you are in the hospital. The second interview will be done three weeks after you are discharged from the hospital. This interview will be done over the telephone and will take about 35 minutes of your time.

WOULD YOU CONSIDER COMPLETING THREE SURVEYS?

During the interviews you will be asked to answer questions to three surveys about family stress, family functioning, and how you have been feeling emotionally since your discharge from the hospital.

You will receive a gift for your participation.

HOW CAN YOU TAKE PART IN THE STUDY?

If you live in your own home or that of a family member, plan on going home after leaving the hospital, can identify at least one family member, speak and understand English, and have access to a telephone you may be eligible to take part in this study.

If you are interested in taking part in the study, just let the nurse researcher know when she visits.

DO YOU HAVE TO TAKE PART IN THE STUDY?

No. Please know that you will receive standard care whether or not you take part in the study.

If you do take part in the study, all information will remain confidential.

While participating in this study may not directly benefit you, your participation may provide information that will help others having the same type of surgery.

FOR MORE INFORMATION CONTACT RHONDA MCLAIN

APPENDIX E

PARTICIPANT CONSENT FORMS

Informed Consent For Research Study

TITLE OF RESEARCH: Relationship between Family Stress, Family Adaptation, and Psychological Well-being of Elderly Coronary Artery Bypass Graft Surgery Patients

INVESTIGATOR: Rhonda M. McLain, MN, RN

EXPLANATION OF PROCEDURES:

You are being asked to take part in a research study. The purpose of the study is to see how family stress and family adaptability affect the mood of coronary artery bypass graft surgery (CABGS) patients after discharge from the hospital. You are being asked to be in this study because of your age and the type of surgery you have had. About 60 patients will take part in the study.

To be able to be in the study, you must have lived in your own home or the home of a family member prior to your surgery. It is also necessary that you return to your home or that of a family member when you are discharged. You must identify at least one person you think of as a family member. You must be able to speak and understand English and be able to use a telephone.

If you decide to take part in the study, you will be asked to complete two interviews. The first interview will be done while you are in the hospital. During this interview, you will be asked to provide some general information about you and your family. This should take less than 15 minutes.

The second interview will take place on the telephone about three weeks after you are discharged from the hospital. During this telephone call, you will be asked to complete four surveys. One set of questions will be about stressful events that you and your family have experienced during the past year. The second survey asks questions about how you and your family cope with different family situations.

The third survey is a group of questions asking how you have been feeling emotionally since you were discharged. You also will be asked two questions about how much bodily pain you have been experiencing since being discharged from the hospital. This interview will take about 45 minutes. You will be called ahead of time to schedule this interview for a time that is convenient to you. The surveys will be mailed to you before the interview for you to have the questions with you during the interview.

By agreeing to be in the study, you also will be giving permission for me to review your chart to find out about your surgery and recovery.

Participant's Initials: _____

If you agree to be in this study, you will not be able to take part if you are in the hospital longer than 14 days after your surgery. If your physical condition should change before or after you are discharged, you may not be able to continue in the study.

RISKS AND DISCOMFORTS:

Any risks for taking part in the study are small. You may become tired while answering the questions over the telephone. If you experience any physical discomfort during any of the meetings, the interview will be stopped at once. Suitable referrals will be made to your health care provider if necessary. Rarely, some minor discomfort may occur when answering questions of a personal nature about you or your family. You do not have to answer any questions that make you uncomfortable. There may be discomforts that occur during the interviews that are not yet known. Both interviews will be done at a time good for you to help reduce any discomfort.

BENEFITS:

You may not benefit from being in this research. By being in this study, you may help provide information that could help health care providers to better prepare patients and families who also go through this type of surgery.

ALTERNATIVES:

The alternative is not to participate in this study. Whether or not you are in the study will have no affect on your care.

CONFIDENTIALITY:

Your privacy will be protected to the extent of the law in several ways. You will answer the questions in a private setting in the hospital (first interview) or your home. Your name will not appear on any of the questionnaires. Any documents with your name or other identifying information will be kept in a locked file. Only the principal investigator or her research assistant will see information obtained on you or your family during the course of the study. The University of Alabama at Birmingham Institutional Review Board, the Nursing Research Committee and Institutional Review Board of Piedmont Hospital, and the FDA also will have access to the study information if needed. Should the results of this study be published, only group information will be reported.

Participant's Initials: _____

WITHDRAWAL WITHOUT PREJUDICE:
Your decision to be in the study is completely voluntary. You have the right to refuse to be in this study. You can stop at any time after giving consent. This decision will not affect in any way your current or future care or any other benefits to which you are otherwise entitled. The study investigator may stop you from taking part in this study at any time if she decides it is in your best interest, or if you do not follow study instructions.

SIGNIFICANT NEW FINDINGS:
Rhonda McLain will give you information about any findings that develop during the course of the study that may affect whether or not you want to continue in the study.

COST OF PARTICIPATION:
There will be no cost to you for being in the study. The costs of your standard medical care will be billed to you or your insurance company in the usual manner.

PAYMENT FOR PARTICIPATION IN RESEARCH:
You will be given a $10 gift card after completing the telephone interview. This gift will be mailed to your home within one week of the interview.

PAYMENT FOR RESEARCH RELATED INJURIES:
Piedmont Hospital, the University of Alabama at Birmingham, the principal investigator, and your doctor have made no provision for monetary payment in the event of injury resulting from the study. In the event of such injury, treatment will be provided but it will not be free of charge.

QUESTIONS:
If you have any questions about the research study or a research- related injury, Rhonda McLain, RN, the study investigator, would be glad to answer them. Ms. McLain's phone number is (770) 961-3592. If you have questions about your rights as a research participant, you may contact Ms. Sheila Moore, Director of the Office of Institutional Review Board for Human Use (IRB). Ms. Moore can be reached at (205) 934- 3789 or 1-800-822-8816 (press option #1 and ask for extension 4- 3789) between the hours of 8:00am and 5:00pm CT, Monday through Friday.

LEGAL RIGHTS:
You are not waiving any of your legal rights by signing this consent form.

Participant's Initials: _____

SIGNATURES:

Your signature below indicates that you have read (or been read) the information provided above, have received a copy of the consent form, and agree to participate in this research study.

Signature of Participant Date Time

Printed Name of Participant

Signature of Witness Date
Time

Signature of Principal Investigator Date Time

Emory University School of Nursing Consent and Authorization to be a Research Subject

---

Title: Relationship Between Family Stress, Family Adaptation, and Psychological Well-Being of Elderly Coronary Artery Bypass Graft Surgery Patients

Principal Investigator: Sandra Dunbar, RN, DSN; Rhonda McLain, RN, MN

Explanation of Procedures:

You are being asked to take part in a research study. The purpose of the study is to see how family stress and family adaptability affect the mood of coronary artery bypass graft surgery (CABGS) patients after discharge from the hospital. You are being asked to be in this study because of your age and the type of surgery you have had. About 60 patients will take part in the study.

To be able to be in the study, you must have lived in your own home or the home of a family member prior to your surgery. You must be planning to return to your home or that of a family member when you are discharged. You must identify at least one person you think of as a family member. You must be able to speak and understand English and be able to use a telephone.

If you decide to take part in the study, you will be asked to complete two interviews. The first interview will be done while you are in the hospital. During this interview, you will be asked to answer some general questions about you and your family. This should take less than 15 minutes. I also will review your hospital chart for information regarding your surgery and hospital stay.

The second interview will take place on the telephone about three weeks after you are discharged from the hospital. A research assistant or myself will call you ahead of time to schedule the second interview at a time when it is convenient for you. During this interview, you will be asked to answer questions on three forms that I will send to you ahead of time.

One set of questions asks about events that you and your family may have experienced during the past year. The second form asks questions about how you and your family act in different family situations. Lastly, you will be asked about your pain level and your mood and morale since you were discharged. The second interview will take about 35 minutes.

Participant's Initials_____

You may not be able to continue in the study if you are in the hospital longer than 14 days after your surgery. If your physical condition should change before or after you are discharged, you may not be able to continue in the study.

Risks:
Any risks for taking part in the study are small. You may become tired while answering the questions over the telephone. If you experience any physical discomfort during any of our talks, the interview will be stopped at once. Suitable referrals will be made to your health care provider if necessary. Rarely, some minor discomfort may occur when answering questions of a personal nature about you or your family. You do not have to answer any questions that make you uncomfortable. There may be discomforts that occur during the interviews that are not yet known.

Benefits:
You may not benefit from being in this research. By being in this study, however, nurses may learn new things that will help others.

Alternatives:
The alternative is not to participate in this study. Whether or not you are in the study will have no affect on your care.

Confidentiality and Protected Health Information (PHI):
Your privacy will be protected in several ways. You will answer the questions in a private setting in the hospital (first interview) or your home (second interview). Your name will not appear on any of the questionnaires. Only the research assistant or myself will see information obtained on you or your family during the course of the study.

PHI is a term we use for protected health information. PHI are any facts about you or your health that could tell someone who you are. "Researchers" are what we call the people who are conducting the study. They may need to look at your medical and study records that contain PHI. Government agencies also may need to look at your records. They make rules and policies about how research is done. They include the Office for Human Research Protections and the Food and Drug Administration. Sponsors who pay for the study also have the right to review your records. So does the Emory University Institutional Review Board (IRB) and the University of Alabama at Birmingham IRB. Your PHI also may be disclosed if a court of law should order it.

Participant's Initials_____

Your records will not be used or disclosed in any ways other than the ways I have described in this form. I will keep your records private to the extent allowed by law. I will do this even if outside review of your records occurs. I will use a study number rather than your name on study records where I can. Your name and other facts that might point to you will not appear when I present this study or publish its results.

A federal law now protects the privacy of your PHI. This law is the Health Insurance and Portability and Accountability Act (HIPAA). That law says we must tell you what we will use your PHI for and how we will use and disclose it before we can let any of that happen. We give you those facts about your PHI in this section of this form. It will tell you facts you need to know such as:

1. What PHI of yours the Researchers will look at.
2. Who will collect your PHI.
3. Who will use your PHI.
4. With whom your PHI will be shared and the and why it is shared each time.
5. The date or event, if any is set, after which we won't use or disclosure your PHI any more; and
6. Your rights under HIPAA to ask us not to use your PHI any more.

You may choose to join in this research. If you do you will be agreeing to let the Researchers and any other persons, companies or agencies described below to use and share your PHI for the study in the ways that are set forth in this section. So please review this section carefully.

What PHI will the Research Team Use:
Either a research assistant or I will look at information that identifies you such as your name, address, phone number, birth date and social security number. We will also look at your medical history and at any results from laboratory tests and physical examinations that you have had performed. We will also look at information about your surgery. We will record this identifiable information in your research file.

Who will Collect the PHI:
Either a research assistant or I will collect and record the PHI described above. If any of the PHI is to be shared with other persons, as described later on in this section, then I also will be responsible for making these disclosures.

Participant's Initials_____

Who will Use the PHI; With Whom will it be Shared; and For What Purpose(s) Will it be Used or Shared:
I have told you of the need to collect your PHI in order to conduct the study. We will share your PHI with the following persons, agencies or companies. They will use your PHI only for the purposes listed in the chart below:

Person/ Entity	Purpose
Rhonda McLain (Researcher)	To conduct the study entitled, "Relationship between Family Stress, Family Adaptation, and Psychological Well-Being of Elderly CABGS Patients", the purpose of which is to study influence of family on the mood of CABGS patients during recovery.
Governmental Agencies with oversight over the research being conducted, including the FDA and OHRP	To monitor safety, efficacy, and compliance with applicable laws and regulations.
University personnel, committees and department charged with oversight of research, including the IRB of Emory University and University of Alabama at Birmingham	To monitor safety and compliance with applicable laws, regulations and University policies and procedures.
Statisticians hired by the Research	To perform data analysis.

Expiration Date or Event:
At the time at which the study is closed and the period for which any records relating to the study must be retained has ended.

Your Right Under HIPAA to Revoke Your Authorization and Ask Us Not to Use Your PHI Any More:
It is your free choice to give the Researchers your OK to use and share your PHI. The term for this OK is called your "authorization." At any time you may take back your authorization for me to use and share your PHI. The term used for taking back your authorization is "revoke." Revoking your authorization means the Researchers may no longer be able to treat you as they do now because you are in the study. But revoking your authorization will not have a bad affect your current or future health care. Revoking your authorization also does not involve a penalty. And it does not involve the loss of any benefits that you could get otherwise.

Participant's Initials_____

It is a simple process to revoke your authorization for us to use your PHI. You may do this by completing and signing what we call a "revocation letter." We will give you a copy of that letter along with your copy of this Combined Informed Consent/HIPAA Authorization form. You would fill it out and sign it if you choose to revoke your authorization. Then you would give it to the researchers. The Researchers will give you another copy at any time you want one. You must make a written request to revoke your authorization to use your PHI. We will act at once if we get a letter from you revoking your authorization to use your PHI. We will not make any other use of your PHI or share it with anyone else, except as follows:

- We will tell the study sponsor (if any) that you have revoked the authorization to use your PHI.

- We will still give data to the study sponsor (if any) or to others to whom we promised it even after we get the letter revoking your authorization. We will do that to preserve the integrity of the research study. We will give PHI data to any governmental or University personnel, departments, or committees that may need it to comply with any laws, regulations, or policies. We will also give PHI data to any of these groups that need it to investigate the failure to comply with laws, regulations, or policies, or adverse events from the study.

Signature and Date:
I will ask you to sign and date this form. You will be given a copy of the consent form.

PHI May be Re-disclosed:
If we disclose your PHI to one of the other parties described above, that party might further disclose your PHI to another party. If your PHI is further disclosed, then the information is no longer covered by HIPAA. Your name and other facts that might point to you will not appear when we present this study or publish its results.

Participant's Initials_____

Compensation:
We will arrange for emergency care if you are injured by this research. However, Emory University, University of Alabama at Birmingham, the researcher, and your doctor have not set aside funds to pay for this care or to compensate you if a mishap occurs. If you believe you have been injured by this research, you should contact Ms. Rhonda McLain. (Phone (770) 961-3592)

You will be given a $10 gift card for completing all study questions during the telephone interview. This gift will be mailed to your home within one week of the interview.

Costs:
There will be no cost to you for being in the study. The costs of your standard medical care will be billed to you or your insurance company in the usual manner. If you are eligible for Medicare, certain costs (referred to as "routine costs") may be billed to Medicare. "Routine costs" include the charges for medical care and items that you would receive even if you were not in this study.

Contact Persons:
If you have any questions about the research study or a research- related injury, Rhonda McLain, RN, the study investigator, would be glad to answer them. Ms. McLain's phone number is (678) 360-3595. If you have questions about your rights as a research participant, you may contact either Dr. James W. Keller, Chairman of the Emory University Institutional Review Board at (404) 727-5646 or Ms. Sheila Moore, Director of the Office of Institutional Review Board for Human Use (IRB). Ms. Moore can be reached at (205) 934- 3789 or 1-800-822-8816 press option #1 and ask for extension 4-3789 between the hours of 8:00am and 5:00pm CT, Monday through Friday.

New Findings:
We may learn new things during the study that you may need to know. We can also learn about things that might make you want to stop participating in the study. If so, you will be notified about any new information.

Participant's Initials_____

Voluntary Participation and Withdrawal:
Your decision to be in the study is completely voluntary. You have the right to refuse to be in this study. You can stop at any time after giving consent. This decision will not affect in any way your current or future medical care or any other benefits to which you are otherwise entitled. The study investigator may stop you from taking part in this study at any time if she decides it is in your best interest, or if you do not follow study instructions.

We will give you a copy of this consent and authorization form to keep.

If you're willing to volunteer for this research, please sign below.

_____
Subject's Printed Name

_____	_____	_____
Subject's signature	Date	Time
_____	_____	_____
Witness (If Required)	Date	Time
_____	_____	_____
Person Obtaining Consent	Date	Time

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM
DOCTOR OF SCIENCE IN NURSING

Name of Candidate Rhonda M. McLain

Graduate Program Nursing

Title of Dissertation Relationships Among Family Stress, Family Adaptation, and Psychological Well-Being of Elderly Coronary Artery Bypass Graft Surgery Patients

I certify that I have read this document and examined the student regarding its content. In my opinion, this dissertation conforms to acceptable standards of scholarly presentation and is adequate in scope and quality, and the attainments of this student are such that she may be recommended for the degree of Doctor of Science in Nursing.

Dissertation Committee:

Name		Signature
Carol J. Dashiff	**, Chair**	
Alfred A. Bartolucci		
Sandra Dunbar		
Joan Grant		
Marguerite Kinney		

Director of Graduate Program

Dean, UAB Graduate School

Date