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ABSTRACT

Evaluation of a Pre-Cardiac Surgery Educational Program Offered in an Ambulatory Care Unit.

Cynthia Kathleen Davis

Master of Science, 2000

University of Toronto, Graduate Department of Nursing Science

A quasi experimental two-group, pre-post test design was used to examine the effectiveness of a preoperative cardiac surgery education program offered in an ambulatory outpatient clinic in reducing anxiety and increasing surgery-related knowledge.

A convenience sample of 52 subjects who had initial coronary artery bypass graft surgery, were included in this study. Twenty-six were prepared as out-patients and 26, prepared as in-patients were admitted to hospital the night before surgery. Data collection took place at four points in time: prior to attending the preoperative cardiac education session, immediately following the session, the morning of surgery and three to four days postoperatively. Repeated measures analysis of variance was used to compare the two groups of subjects across the four points of data collection.

The results of the study revealed no differences between the two groups in terms of anxiety and knowledge. Findings revealed, that changes occurred in both knowledge and anxiety scores regardless of the group to which the subjects belonged. The increase in knowledge scores immediately following the preoperative education session was statistically significant (p<.000). Anxiety scores were similar for both groups of patients with a statistically significant decrease seen in the postoperative period (p<.002).

The implications for research, theory and practice were examined.
Acknowledgment

I would like to acknowledge the people who supported and encouraged me as I completed my thesis. In particular, I would like to thank the members of my thesis committee, Dr. Souraya Sidani, Dr. Jane Graydon and Judy Costello who guided me throughout the research process.

To my husband and family, am grateful for your love and support.
# Table of Contents

Abstract ................................................................................................................................. i
Acknowledgement .................................................................................................................. ii
Table of Contents .................................................................................................................. iii
List of Tables ......................................................................................................................... vi
List of Appendices ................................................................................................................. vii

## Chapter 1: The Problem and Purposes

- The Background .................................................................................................................. 1
- Significance of Problem ..................................................................................................... 3
- Problem Statement ............................................................................................................. 3
- Purpose ............................................................................................................................... 4
- Review of the Literature .................................................................................................... 4
- Summary ............................................................................................................................. 13
- Conceptual Framework ..................................................................................................... 15
- Research Hypothesis ......................................................................................................... 17
- Definitions of Terms .......................................................................................................... 18

## Chapter 2: Methodology

- Research design ................................................................................................................. 19
- Setting ................................................................................................................................. 20
- Description of Intervention ............................................................................................... 20
- Sample Selection ............................................................................................................... 20
- Instrumentation .................................................................................................................. 21
Tables

Table 1: Data Collection Procedure .................................................................26
Table 2: Characteristics of the Groups by Frequency ......................................29
Table 3: Frequency Distributions for Knowledge Scores ................................32
Table 4: Mean and Standard Deviation Scores for Knowledge ..................33
Table 5: Frequency Distributions for Anxiety Scores ....................................34
Table 6: Mean and Standard Deviation Scores for Anxiety .........................35
Table 7: Results of Repeated Measure Analysis of Variance for Knowledge ....36
Table 8: Paired t-test for Knowledge .................................................................37
Table 9: Results of Repeated Measure Analysis of Variance for Anxiety .......38
Table 10: Paired t-test for Anxiety .................................................................39
Appendices

Appendix A: Description of Educational Programs ..........................................................64
Appendix B: Coronary Artery Bypass Graft Knowledge Questionnaire ................................65
Appendix C: Patient Profile Form: Part A........................................................................69
Appendix D: Patient Profile Form: Part B......................................................................70
Appendix E: Designate’s Request for Contact .................................................................71
Appendix F: Information Sheet .......................................................................................72
Appendix G: Consent Form ............................................................................................73
Chapter 1

Problem and Purpose

Background

In Canada, heart disease continues to be the number one cause of mortality with 79,604 deaths in 1995; 55% (46,065) of these deaths were directly associated with ischemic heart disease. Coronary artery bypass graft (CABG) surgery is one of the commonly accepted treatments for ischemic heart disease. Between 1993 and 1994, CABG surgery for males and females in Canada totalled 29,703 and 10,844 respectively (Heart and Stroke, 1999).

Although CABG surgery contributes to the overall improvement of quality of life for many individuals living with coronary artery disease, surgery and the associated waiting period can be a major stressor. Moreover, patients in need of CABG surgery are often informed that they require surgery several weeks or months in advance. Waiting periods, in the absence of any interventions, can be seen as additional time to dwell on fears of impending surgery (Recker, 1994).

Researchers investigating methods of reducing preoperative anxiety in CABG surgery patients, have shown that preoperative educational programs play a role in lowering preoperative anxiety levels (Christopherson & Pfeiffer, 1980; Cupples, 1991). CABG surgery patients who received preoperative instruction on an outpatient basis prior to their surgery tended to have higher levels of knowledge recall following the educational sessions and lower levels of preoperative anxiety compared to those patients who were admitted to hospital the night before surgery (Christopherson & Pfeiffer, 1980; Cupples, 1991; Guzzetta, 1979; Hill, 1989; Rice, Mullins & Jarosz, 1992). Patients’ level of anxiety and its effects on their readiness for learning is
an important factor for nurses to consider when beginning the preoperative teaching process. Guzzetta (1979), conducted a study to explore patients’ receptivity and ability to learn following a cardiac event. She found that patients with lower levels of psychological anxiety achieved a higher level of learning. The researcher concluded that low to moderate levels of anxiety can be beneficial to learning, whereas higher levels can incapacitate patients, preventing learning from taking place. If anxiety levels are high, the patient may be incapable of attaining the goals established for the educational program.

According to Lazarus and Folkman (1984), when people encounter a stressful situation, as in pending surgery, they appraise what can be done to cope with the situation. Seeking information may be one of the coping options available during the stressful encounter. While preoperative education is viewed as an essential component of patient care, prior to the advent of preadmission programs, it was often not available until the day before surgery (Cupples, 1991; Lepczyk, Raleigh & Rowley, 1990). Patients who waited for cardiac surgery often sought information from friends or family who may have undergone such an operation. However, the information they received may not have been accurate or sufficiently adequate to reduce the fears of impending surgery (Christopherson & Pfeiffer, 1980; Recker, 1994). In comparison, formal preoperative education programs have been found effective in assisting patients in their coping. Hathaway (1986) conducted a meta-analysis of 68 studies associated with patient education; the results indicated that patients who received preoperative teaching had postoperative outcomes that were 20% more favourable than those of patients who did not receive such instruction. In addition, Lindeman (1988), conducted a critical analysis of 120 research articles evaluating the effectiveness of patient education; Lindeman concluded that all patient groups represented in the
review responded favourably to the education provided.

Significance of the Problem

As health care budgets continue to tighten, preadmission clinics are emerging as a strategy to decrease a patient's length of stay in hospital, improve bed utilization and reduce costs. Preoperative education is viewed as an element of care that could be provided on an outpatient basis, since the time available to provide instructions while in hospital is limited (LeNoble, 1993; Rice, Mullin & Jarosz, 1992). Given the success of preadmission programs in preparing patients for surgery and reducing the costs associated with surgical admissions, it is unlikely that such programs will be closed in the future. However, nurses working in preadmission clinics with patients who are preparing for cardiac surgery have questions about the success of the educational programs in helping patients understand their upcoming surgery and reducing their anxiety. The results of a formal evaluation of existing education in preadmission programs may have implications for practice, in relation to program design.

Problem Statement

To decrease costs, many hospitals have established preadmission clinics to facilitate completion of all preoperative diagnostic testing and provide preoperative educational programs within a few weeks prior to surgery. However, there is little empirical evidence examining the effectiveness of educational programs offered in preadmission settings. With changes rapidly occurring in the admission and preoperative education process for patients undergoing CABG surgery, formal evaluation of these services needs to occur. This study evaluated the effectiveness of a preoperative cardiac education program for CABG surgery patients being prepared in a preadmission clinic, in reducing anxiety and increasing surgery-related knowledge. The cardiac
education program provided in the preadmission clinic was compared to routine preoperative
teaching given in hospital the day before surgery. Results of this study provide nurses with initial
information regarding the most appropriate time/place for providing education to patients
awaiting CABG surgery.

Purpose

The purpose of this study was to determine the effects of providing preoperative
education before elective CABG surgery on either an ambulatory, out-patient basis, or in-patient
basis, in reducing anxiety and enhancing knowledge related to CABG surgery. Preoperative
education of the patient preparing for cardiac surgery is recognized as an essential standard and
key component of patient care (Goulart, 1989). Researchers who have investigated preoperative
education in general, contend that patients who receive teaching are better prepared for surgery
and have more positive postoperative outcomes compared to patients who do not receive

Many researchers have examined the effect of preoperative education in relationship to
timing and setting. However, there has been a lack of clear distinction and consistency as to how
these two variables differ. For the purpose of this study, timing is seen as confounded with
setting. The timing of the educational program was considered interchangeable with the place in
which preoperative education is provided, since the educational program given on an out-patient
basis is offered one to two weeks prior to surgery while the program given on an in-patient basis
is offered the day before surgery.

Review of the Literature

A review of the literature revealed few available studies pertaining to preoperative
education for CABG patients who are being prepared as out-patients in preadmission clinics. Of the studies that were available, variable methods of preoperative preparation were used. Therefore, the literature was reviewed in the following areas related to the major study variables: knowledge recall, preoperative education, timing of preoperative education and anxiety levels.

Knowledge Recall

An event such as cardiac surgery may affect the patients’ readiness for learning (Recker, 1994). Investigators who have examined anxiety levels of patients preparing for cardiac surgery contend that patients who have lower levels of preoperative anxiety tend to have higher levels of knowledge recall related to the educational programs they received (Christopherson & Pfeiffer, 1980; Cupples, 1991). Patients who are knowledgeable about illness and upcoming surgery have demonstrated lower incidences of postoperative complications, more positive mood states, performed exercises more correctly and required less teaching reinforcement for physical activity compared to those patients who were less informed (Cupples, 1991; Recker, 1994; Rice & Johnson, 1984).

It has been documented that many patients tend to view education related to their illness or impending surgery as important. Lindeman (1988), conducted a critical analysis of 120 studies examining patient education. The studies included in this review were grouped in five categories which included: characteristics of the patient as learner, educational level, demographic characteristics, trait-treatment interaction and timing of instructions. Lindeman (1988) concluded that all patients who received instruction related to surgery, chronic illness or diagnostic procedures responded favourably to education and that most patients viewed education as important. Generally, patients tended to retain and transfer the knowledge acquired as it related to
their illness or situation (Lindeman, 1988). Building upon the work of Lindeman, the next area of the literature review examined the work of researchers who studied the impact of preoperative teaching on postoperative outcomes.

**Preoperative Education**

Several studies have examined the effect of preoperative teaching on postoperative outcomes. Early resumption of postoperative physical activities such as ambulation and exercise, are key contributors to decreasing postoperative complications. To help patients cope with the fear of resuming physical activities, health care members began to teach patients about their impending surgery and what activities they would be expected to perform postoperatively (Johnson, 1984).

Preoperative education has evolved over the past few decades and the effectiveness of teaching as a nursing intervention has been clearly established in many studies (Lindeman, 1988). Hathaway's (1986) meta analysis examining the effects of preoperative instructions on postoperative outcomes found that adult patients who received preoperative instructions had outcomes that were 67% more favourable than patients who did not. Postoperative outcome variables included: pain, comfort, anxiety, nausea, fever, analgesic use, physical problems and mobility. The results of this meta analysis indicated that preoperative instruction had a positive effect on postoperative outcomes, which in turn, influenced a patient's recovery positively.

Other studies have shown similar relationships between preoperative education and it's impact on postoperative outcomes. Moyer (1994) examined factors associated with the length of stay in the intensive care unit (ICU) on a convenience sample of 100 patients post CABG surgery. The results of this study indicated that of the 71 patients who had not received preoperative
teaching, 37% had increased length of stay in ICU. Despite the positive relationship between preoperative education and length of stay, selection bias because of convenience sampling may have had an impact on the validity of this finding. Patients who had longer ICU stays may have been too ill to participate in preoperative teaching, therefore their pre-existing health status rather than educational preparation may have been the determining factor.

The results of a number of studies concluded that teaching programs are beneficial in improving patients' knowledge of their illness and upcoming surgery (Christopherson & Pfeiffer, 1980; Cupples, 1991; Lindeman, 1988; Moyer, 1994). The next area of review examined whether the time in which information was provided impacted outcome variables.

**Timing of Preoperative Education**

As changes occurred in the admission process for patients preparing for cardiac surgery many researchers began to explore the impact of the timing of preoperative education. The following studies examined whether the time at which information was given impacted on the study variables. Christopherson and Pfeiffer (1980) compared the anxiety scores and understanding of surgery in subjects who did not read any instructional material before surgery, to those who read the material one to two or three to 35 days prior to surgery. All patient groups attended routine preoperative teaching given by registered nurses the night before surgery. A total of 41 white males undergoing initial CABG surgery were randomly assigned to the three groups. Data were collected using the State Trait Anxiety Inventory (STAI) and a knowledge questionnaire that looked at surgery related information. Measurements were taken at three different intervals: upon discovery of the need for surgery, one to two days preoperatively and seven to ten days postoperatively. The results indicated that patients who received and read the
booklet, whether it was one to two days or three to 35 days before surgery, had significantly higher scores on the knowledge questionnaire. Although the content of the booklet is described in terms of pertinent information regarding upcoming surgery, it is unclear as to who developed the booklet. It is important to point out that in this study, the experimental group received instruction twice, which may have influenced the amount of knowledge retained from the information provided.

Rice, Mullin and Jarosz (1992), had similar findings to those of Christopherson and Pfeiffer (1980). In this study they compared the effectiveness of two approaches to teaching patients to prepare for heart surgery. A total of 50 adult patients preparing for initial CABG surgery were randomly assigned to the experimental or control group. The experimental group received preadmission education through a self-instruction package sent to their home six to ten days prior to their scheduled surgery date. The control group received no prior information from the researcher. Following admission to hospital all patients were instructed from the instructional booklet and asked to demonstrate how to cough, deep breath, do leg exercises and get out of bed and walk following surgery. On the fifth postoperative day information was obtained from the patients on mood state, physical activity and analgesic use. The investigators found that the experimental group demonstrated higher preoperative positive mood scores, performed more exercise behaviours correctly and required less teaching time preoperatively than the control group. The groups did not differ on analgesics use, postoperative physical activity or length of stay. Although the experimental group reported higher positive mood scores upon admission, they did not differ from the control group following surgery. The investigators speculated that cardiac surgery and the risks associated with it are very serious and that it may not be realistic to
expect exercise information alone to reduce negative feelings. Similar to the study of Christopherson and Pfeiffer (1980), participants in this study received repeated instruction.

Additional research exploring the timing of preoperative education continues to demonstrate that most patients benefit from information prior to their hospital admission for upcoming surgery. Cuppies (1991) used a repeated measures design to test the effectiveness of preadmission preoperative teaching compared to routine postadmission education. A total of 40 patients scheduled for initial elective CABG surgery were randomly assigned to the experimental or control group. Patients in the experimental group were asked to individually meet the investigator five to 14 days prior to admission at which time the investigator provided 45-60 minute teaching session regarding cardiac surgery. The control group received no instructions beyond the routine educational sessions offered on the day of their admission. Both groups were admitted to the hospital prior to the scheduled surgery date and attended routine education provided by hospital personnel. Outcome data were collected utilizing three instruments; the STAI, Wolfer-Davis Recovery Inventory (RI) and the Profile of Mood States (POMS), at three time intervals: before attending the teaching sessions, immediately following the session and on postoperative day four. Subjects in the experimental group demonstrated significantly higher preoperative knowledge levels, more positive moods states postoperatively, and more favourable physiological recovery following surgery than those in the control group. Despite the experimental group having higher knowledge levels, it is important to note that the person who provided the information in the out-patient setting was different from the nurse who provided education to the postadmission patient group. The education provided on an ambulatory basis had been developed and delivered by the researcher as opposed to the traditional education provided
by staff nurses. The educational preparation of the researcher and the fact that the teaching was provided on an individual basis may have impacted study findings. The staff nurse from the cardiovascular unit may have multiple demands for patient care versus strictly an education role. In addition, patients in the experimental group received a follow-up telephone call by the researcher and attended routine teaching sessions offered to all patients upon admission to hospital. Both factors may have impacted on the outcomes of the study.

Finally, the results of Lepczyk, Raleigh and Rowley's (1990) study, investigating whether the timing of preoperative teaching affected anxiety level and retention of knowledge, were similar to the findings of other researchers (Cuppes, 1991; Rice, Mullins & Jarosz, 1992). Lepczyk, et al (1990) assigned a convenience sample of 72 patients from two different hospitals preparing for initial CABG surgery to an experimental or control group. The experimental group, selected from one hospital, received teaching two to seven days prior to the scheduled surgery date. The control group selected from the second hospital, received teaching the day of admission to hospital. Both hospitals had identical content and teaching methods. Knowledge gained with the class given two to seven days prior to surgery, measured by the Heart Surgery Questionnaire, was significantly greater than for patients who received the information the day of admission. There was also a significant positive relationship between the knowledge score and knowing someone who had cardiac surgery (Lepczk, et al, 1990).

Following a review of the benefits of patients being informed and impact of timing on outcome variables, the next section of literature review examined the work of researchers who studied whether anxiety levels impacted on the retention of information.
Anxiety Levels

Discussions in the nursing literature regarding aspects of surgical preparation are often based on the assumption that a patient’s emotional state is an important factor associated with his or her coping behaviour (Johnson, 1984). Interventions that are directed at reducing negative emotions, such as preoperative education, are expected to increase one’s coping and enhance one’s ability to perform goal directed behaviours (Johnson, 1984). Several researchers have studied the levels of preoperative anxiety of patients preparing for many different types of surgery and have found that preoperative state anxiety levels increase as the day of surgery approaches, reaching peak levels in the 24 hours before surgery (Auerbach, 1973).

The majority of studies examining anxiety levels in patients undergoing CABG surgery have produced similar findings. Kinney (1977) compared the effects of preoperative teaching on patients with different modes of response to threatening stimuli. A convenience sample of 30 male patients preparing for CABG surgery were grouped into three categories: repressors, sensitizers and neutrals based on their level of anxiety measured by the STAI and the Repression-Sensitization (R-S) scales. Patients were admitted to the hospital at least two days prior to surgery. The results showed that although a decrease was seen in the STAI scores following preoperative teaching, the difference was not statistically significant for any of the three patient groups. Small sample size limits the external validity of the study findings.

Similar findings were reported by Anderson (1987) who evaluated the effectiveness of preoperative preparation on anxiety levels. A total of 60 male subjects preparing for elective CABG surgery were randomly assigned to two different experimental groups. The first experimental group received detailed information about the procedure and the sensations they
would experience. The second experimental group was given information plus coping strategies for the upcoming surgery. The control group received the routine hospital preparation. The results indicated that the two experimental groups had lower preoperative anxiety, as reported by the patient; however postoperatively the three groups did not differ from each other on anxiety (Anderson, 1987).

Other researchers studying anxiety levels and the effectiveness of cardiac educational programs in CABG surgery patients have reported lower levels of preoperative anxiety when education is provided earlier than the night before surgery. However these same studies did not show significantly reduced anxiety postoperatively in the experimental groups (Christopherson & Pfeiffer, 1980; Cupples, 1991). Cupples (1991) reported that patients in the experimental group who had attended an education session five to 14 days prior to surgery, had significantly lower preoperative anxiety. In the postoperative phase, anxiety levels were similar for both the experimental and control group patients. Christopherson and Pfeiffer reported that experimental group patients who received educational material three to 35 days before their surgery had a lower level of preoperative anxiety compared to those who received the information the day of admission for surgery. In the postoperative phase, anxiety levels were similar for all patients regardless of when educational material was provided. The investigators pointed out that despite the attempt to randomize patients, patients in the experimental group were approximately seven years younger than the control group and had shorter recovery periods. These factors may have had a stronger impact on the reduced anxiety scores rather than the time at which information was provided (Christopherson & Pfeiffer, 1980).

In contrast to the work of other researchers investigating anxiety levels in CABG surgery,
Lepczyk, et al (1990) found no differences between the experimental and control groups on measures of anxiety. Both groups demonstrated a moderate anxiety level with no significant change over the testing period from pre to postoperative phases. The variable results in this study were explained by Lepczyk, et al, as a reflection of the nature of heart surgery. Heart surgery may be extremely anxiety provoking and preoperative teaching may not be enough to reduce anxiety levels in either the pre or postoperative phase regardless of when instruction is provided (Lepczyk, et al, 1990).

The studies investigating pre and postoperative anxiety have produced variable results. It is important to note that in the studies reviewed, all patients continued to be admitted to hospital the night before surgery. Although patients were in hospital the night before surgery, none of the researchers chose to measure anxiety levels immediately before surgery.

Summary of Related Research

In summary, the number of studies investigating the effects of CABG surgery educational programs offered in outpatient settings are limited. In a number of studies, the education provided in the preadmission period was different than information that had been traditionally provided to patients. In many studies the patients in the experimental group received instruction twice, either verbally or in written material and in one study the experimental group received instruction by the researcher. No data were presented to indicate that traditional or standard education programs offered to inpatients had been examined for content or purpose. The favourable finding of increased knowledge recall for patients prepared through an ambulatory care setting in which the content of the program was developed by researcher may have produced more favourable results simply because the education had been evaluated for content validity and given in conjunction
with a standard education program.

Many subjects in the studies reviewed were still admitted to the hospital the day or evening before surgery. Only one study was found in which seven of the 49 patients were admitted the morning of surgery (Recker, 1994). Questions remain unanswered as to whether the anxiety levels of patients may be different if they await surgery at home compared to those in hospital the night before surgery. The findings of the studies reviewed are limited in terms of applicability to this study, in which the experimental group patients were prepared for surgery in a preadmission clinic and admitted the morning of surgery.

Anxiety has been investigated in a number of studies in relation to CABG surgery patients, however no conclusions can be made given the variability of results. Many of the researchers investigated the anxiety levels of patients in the preadmission process but did not measure the anxiety level the night before surgery. It has been reported that anxiety tends to increase as the surgery date approaches. Generally both experimental and control group patients have been admitted the night before surgery regardless of whether they had been prepared on an out-patient basis. As the 24 hour period before surgery is seen as a time of increased anxiety, this study attempted to explore whether awaiting surgery at home in a familiar surrounding reduced anxiety levels the morning of surgery compared to patients who spend their final night before surgery in hospital.

The research conducted on preoperative teaching provides evidence that education can benefit patients. The inconclusive findings related to knowledge recall and anxiety level of patients who are prepared for surgery as out-patients challenge us to determine the most appropriate time and/or place for education to take place. This study addressed the effects of
providing education to patients on either an out-patient or in-patient basis.

Conceptual Framework

The theory of stress and coping developed by Lazarus and Folkman (1984), provided the framework for this study. This theory is relevant to the study, as heart surgery may elicit considerable amount of stress and anxiety (Anderson, 1987). Information, such as preoperative instructions, may assist patients in their coping and subsequently in their appraisal of their illness or impending surgery.

According to Lazarus and Folkman (1984), psychological stress can occur when the environment is appraised by the individual as taxing or exceeding his or her resources and endangering his or her well-being. The theory postulates that when individuals are confronted with a stressful situation an appraisal process takes place. Cognitive appraisal is an evaluation process focused on understanding the meaning or significance of the situation to the individuals' well-being.

The cognitive appraisal process is made up of three types of appraisal; primary, secondary and reappraisal occurring at both the conscious and unconscious level (Lazarus & Folkman, 1984). Primary appraisal occurs when individuals judge the encounter as irrelevant, benign-positive or stressful. Essentially this is an evaluation by the individual as to the meaning of the stimulus. Stress appraisal can take three different forms; harm or loss, threat, or challenge. Harm or loss refers to the damage the individual has already sustained. For patients preparing for CABG surgery this may include the loss of stamina or physical functioning associated with a diagnosis of a serious illness such as heart disease. The threat may be seen as the anticipated harm of cardiac surgery or fear of death from various sources during their surgical experience.
(primary appraisal). Threat which centres on potential harms can be characterized by "negative emotions such as fear, anxiety and anger" (Lazarus & Folkman, 1984, p. 33). The challenge appraisal focuses on potential gains and growth. According to Lazarus and Folkman (1984) the threat and challenge appraisals are not mutually exclusive and can occur simultaneously. In the case of patients preparing for CABG surgery, patients may feel the fear of impending surgery at the same time many feel hopeful about improved quality of life following cardiac surgery.

Secondary appraisal is the judgement as to what can be done to deal with the situation. It involves evaluating whether a particular coping strategy will accomplish the desired outcomes. In the case of patients preparing for CABG surgery, individuals may use problem-solving skills to seek information and to evaluate if information about heart surgery can be applied to the situation and used as an effective strategy to deal with the demands of the situation. Preoperative information may assist patients in appraising an illness or impending surgery and may be seen as a resource for coping with the experience (secondary appraisal). In particular, preoperative education informs patients of specific action they can take to facilitate their own recovery (Cupples, 1991).

Reappraisal "refers to a change in appraisal based on new information from the environment and/ or the person" (Lazarus & Folkman, 1984, p.53). Patients may change their original perception of the experience based on new information (reappraisal), and select a coping strategy appropriate to the nature of the stressor and their resources for dealing with it. Regardless of the source, any shift in the person-environment relationship will lead to a reappraisal of what is happening. In both short and long term situations, there is an unfolding, shifting of patterns of the cognitive appraisal and emotional process (Lazarus & Folkman, 1984).
Pending CABG surgery is viewed as a threat. In this study, the perceived threat of surgery (primary appraisal) results in the emotional response of anxiety. Preoperative education is considered a resource that could assist patients in their coping (secondary appraisal) with the surgery experience, leading to the perception of surgery as less threatening (reappraisal), thereby reducing anxiety. Researchers studying patients who receive preoperative education have reported that these patients value instruction because it allows them an opportunity to participate in their own recovery (Hathaway, 1986). High levels of anxiety may inhibit learning (Guzzetta, 1979) hence, preadmission preparation of patients may create an environment for greater learning if anxiety levels are lower. In this study only the appraisal component of Lazarus and Folkman was explored.

Research Hypothesis

1. Individuals who received educational preparation on an out-patient basis and were admitted to hospital the morning of their surgery have higher levels of surgery related knowledge both pre and postoperatively, than individuals who received educational preparation on an in-patient basis and were admitted to the hospital the day before surgery.

2. Individuals who received educational preparation on an out-patient basis and were admitted to hospital the morning of their surgery have lower levels of anxiety both pre and postoperatively, than individuals who received educational preparation on an in-patient basis and were admitted to the hospital the day before surgery.
Definitions of Terms

**Preadmission Education:** instruction provided to a patient preparing for CABG surgery in an outpatient setting, one to two weeks prior to surgery.

**Post-admission Education:** instruction provided to a patient preparing for CABG surgery in an inpatient setting, the day before surgery.

**Knowledge:** refers to an individual’s ability to remember the information provided about cardiac surgery.

**Anxiety Level:** refers to a transitory emotional state or condition of an individual that is characterized by subjective, consciously perceived feelings of tension and apprehension (Spielberger, 1970). Anxiety can be experienced with a stressful event such as CABG surgery.
Chapter 2

Methods and Procedure

Research Design

A quasi experimental two-group, pre-post test design was used to examine the effectiveness of a preoperative cardiac surgery education program offered in an ambulatory outpatient clinic in reducing anxiety and increasing surgery-related knowledge. The program was compared to the same educational program which is offered to patients the day before surgery. That is, patients who are prepared as out-patients were given the same educational program as in-patients. All patients were given instructions by registered nurses at their respective hospitals.

Patients in this study were assigned to the experimental or control group based on whether they were scheduled to attend a preadmission clinic or to be admitted to the hospital the day before the scheduled CABG surgery, respectively. The decision as to whether patients preparing for CABG surgery would attend preadmission clinics was based on the surgeon's office bookings. Although all elective CABG surgery patients are potential candidates for preadmission clinics, some surgeons are reluctant to send patients to the preadmission clinics. Reasons for this reluctance relates to the patients' existing health status or location of their residence. There is a tendency for patients who have severe cardiac conditions or co-morbidities, or who live outside the metropolitan area to be admitted to hospital the day before surgery. Patients in both groups were compared on demographic and illness related characteristics that might have influenced the decisions regarding their group assignment. No statistically significant differences in cardiac conditions or co-morbidities were found between the two groups.
Setting

The setting for this study included two large acute care teaching hospitals in a large urban setting. At one site, patients were taken to a surgical holding area for up to one hour prior to surgery to which the researcher was not permitted access. As a result only five patients recruited from this site were included in the study. The remaining 47 patients were recruited from the other site where admittance to a surgical holding area was not required.

Description of Intervention

The cardiac teaching sessions in both hospitals were designed by clinical experts and all patients were shown the same preoperative teaching video. The classes offered for in-patients and out-patients were similar in content and teaching method (Appendix, A). Registered nurses from cardiovascular units or the out-patient area were responsible for providing instructions to both in-patients and out-patients. In both settings time was allocated for patient discussion, questions and the reinforcement of information.

Sample Selection

Based on power analysis where the alpha level was set at .05 and the beta at .80, and the effect size anticipated to be moderate (Cohen, 1992), this study used a convenience sample of 52. Twenty-six patients were prepared as out-patients admitted to hospital the morning of surgery and 26 patients were prepared as routine in-patients who were admitted to the hospital and given instructions the day before surgery.

Patients preparing for CABG surgery who met the following criteria were invited to participate in the study:

1. Over the age of 18.
2. Undergoing elective CABG surgery for the first time.

3. Prepared for surgery as an in-patient on the day before surgery, or as an out-patient and scheduled for surgery within one to 14 days of the preadmission visit.

4. Able to read, write and speak English.

Instrumentation

Anxiety Level

Anxiety was measured by the State Trait Anxiety Inventory, State-Form (STAI-S). The STAI measures the transitory state of anxiety. It consists of 20 statements describing feelings of anxiety. Subjects indicate the intensity of anxiety feelings using a four point Likert type scale, ranging from 'not at all' to 'very much so'. Each item is given a rating score of one to four. A total score is obtained by summing all items and can range from 20 to 80. A higher score represents higher anxiety. Alpha reliability coefficients for this scale range from 0.83 to 0.92 (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Concurrent validity has been documented for this measure of anxiety by comparison with other anxiety scales (Cupples, 1991). For the purpose of this study, data on anxiety were collected at four points in time. At each time, data on anxiety were collected using five questions that were randomly selected from the 20 item STAI, thereby minimizing response burden and reducing the potential threat of retesting. The use of five questions from the STAI has demonstrated valid measurements of anxiety consistent with the use of the entire 20 item scale (Spielberger, Gorsuch, & Lushene, 1970). The internal consistency of the five item measure was evaluated in this study. The Cronbach's alpha coefficient in this study, for the five item measure was 0.62, 0.64, 0.73 and 0.58 for T₁ through T₄ respectively.
Knowledge Recall

CABG surgery related knowledge was measured with the CABG Surgery Knowledge Questionnaire (KQ). The KQ (Appendix, C) is a 20-item, multiple choice test designed by Cupples (1991) to measure patients' knowledge related to CABG surgery. The KQ was developed based on the educational objectives from a preoperative teaching program for patients undergoing elective CABG surgery. General areas of content include; anatomy and physiology of the heart, preoperative routine, intraoperative routine, postoperative routine and possible complications. Content validity of the original KQ was established by a panel of 12 experts. The KQ was revised according to the panel's suggestions and the questionnaire was tested on a sample of 12 subjects. Coefficient alpha for the KQ was 0.71 and a two week test-retest reliability was 0.87. The scoring is based on one point per correct answer. The possible range of score is 0 to 20, with a score of 20 indicating a perfect score.

For the purpose of this study, the KQ was evaluated by the researcher to ensure that questions corresponded to the content of preoperative teaching provided at both sites selected for the study. The evaluation consisted of the researcher reviewing the content of both the preoperative teaching video and the outline of teaching sessions provided to the patients by nursing staff following attendance at the teaching session. For the purpose of this study, minor modifications were made to five questions on the KQ to ensure possible responses reflected current practices at the data collection locations for this study. For example, modifications were made to the questions regarding possible length of stay in hospital following surgery, when to expect visits from physicians and location of nursing units. Cupples (1991) reported a reading level of grade ten for the KQ based on Smog analysis. In this study, modifications such as use of
single syllable words, where appropriate were made to the KQ to reduce the reading level to grade 5.2 on readability index using the Flesch-Kincaid Grade level reading scale. These changes were made as it was felt that many of the study subjects may not have completed educational preparation to the level of grade 10. The internal consistency of the revised KQ was evaluated in this study. The Cronbach's alpha coefficient was; 0.45, 0.57 and 0.47 for T₁, T₂ and T₄ respectively.

Other Variables

A patient profile form (Appendix C) was used to record demographic information given directly by the patient. The following personal information were included: age, gender, education, martial status and knowing someone who has had CABG surgery. From the patient’s hospital record, data related to concurrent illnesses and postoperative complications were collected by the researcher.

Protection of Subjects' Rights

Approval for the study was obtained from the Human Subjects Review Committee at the University of Toronto, and at the participating hospitals.

Nurses and care coordinators approached the patients who met the inclusion criteria, introduced the study to them (Appendix E) and obtained verbal consent to meet the investigator at the time of their appointments. Patients were informed that agreement to meet with the investigator did not oblige them to participate in the study. Patients who agreed to meet the investigator were given an explanation of the study with an opportunity to ask questions; those who agreed to participate were asked to sign a consent form prior to data collection (Appendix F). Patients were informed that participation was voluntary and any decision to participate or
withdraw would not affect the treatment they received. Following an explanation of the study, written consent to participate was obtained. The subject’s written consent provided consent to access the patient’s chart (Appendix G). All information was kept confidential and participation in the study could be terminated at any time. Code numbers were used on questionnaires, and consents forms were kept in a locked file separate from the data. Subjects were informed that their names would not be published in any reports. Privacy was assured by administering the questionnaires in a quiet location at the clinic site, preoperative care area, or on in-patient units.

Risk/Benefit

Patients were told that they would not personally benefit from participating in the study, but that the information they provided may help others who require CABG surgery in the future. Evaluation of existing educational preadmission programs may have implications for practice, in relation to program design.

Data Collection Procedure

The investigator contacted nurses or care coordinators to obtain a list of patients who agreed to be contacted by the investigator. Patients in the preadmission clinics generally arrived in the morning and were scheduled to be seen by members of the health care team and receive all diagnostic work up in preparation for surgery. Midday, all patients were gathered together for preoperative teaching. Patients attending preadmission clinics returned to the hospital the morning of their surgery. Patients prepared for surgery as in-patients were admitted to hospital the day before their surgery, seen by members of the health care team and all diagnostic work up was completed at that time. Generally, later that evening, all patients were gathered together for preoperative teaching.
Prior to attendance at the preoperative cardiac education session for either the out-patient preadmission or the in-patient group, consent to participate in the study was obtained and data collection commenced. Subjects were asked to respond to the questionnaire prior to attending the preoperative cardiac surgery educational program. The questionnaire administered prior to teaching (T₁) included; Patient Profile Form, five randomly selected questions from the STAI-State Form and the Knowledge questionnaire. Following the teaching session the subjects were asked to complete five randomly selected questions from the STAI-State Form and the KQ (T₂). The testing at T₁ and T₂ measured the effect of the education program on increasing knowledge and reducing anxiety. The morning of surgery was seen as a busy time when final preparations are completed and anxiety levels could be at a peak (Auerbach, 1973), however the decision to collect data on anxiety at this time was based on the gaps in the literature. The morning of surgery (T₃), all subjects were asked to complete five randomly selected questions from the STAI-State Form which was generally completed in less than five minutes. Following surgery between postoperative day three to four (T₄), all subjects were asked to complete five randomly selected questions from the STAI-State Form and the KQ. Data collected at T₄ attempted to measure the impact of preoperative education on postoperative knowledge level and anxiety. The researcher collected all the data at each point in time, thereby ensuring the data were collected in a consistent manner and under comparable conditions. Table 1 summarizes the data collection procedure for both groups of patients included in the study.
Table 1

Data Collection Procedure

<table>
<thead>
<tr>
<th></th>
<th>T1 (prior to teaching)</th>
<th>T2 (following teaching)</th>
<th>T3 (morning of surgery)</th>
<th>T4 (postoperative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Profile Form</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT-State Form Five</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>items Knowledge Questionnaire KQ</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Data Analysis

The patient profile characteristics of the sample as well as the major variables under investigation were described in terms of measures of central tendency and variability within the sample. Repeated measures analysis of variance was used to compare the two groups of patients across the four points of data collection, on the outcome variables of anxiety and knowledge.
Chapter 3

Findings

Introduction

A quasi-experimental repeated measure design was used to evaluate the effectiveness of a preoperative cardiac surgery education program. Data were collected at four points in time. The SPSS computerized statistical program supported data analysis. Level of significance was set at p \( < .05 \). The results are presented in four major sections: (1) Response rate, (2) characteristics of sample, (3) total scores for knowledge and anxiety, and (4) findings related to the research hypotheses.

Response Rate

Data were obtained from two groups of patients. The preadmission group (group 1) represented patients who were seen in an out-patient setting one to 14 days prior to surgery and attended an educational class at that time and were admitted to hospital the morning of their surgery. The postadmission group (group 2) represented patients who were admitted to hospital and attended an educational class the night before surgery. Two patients in the preadmission group and one patient in the post-admission group who were approached refused to participate in the study without explanation, reflecting a response rate of 94.2%. Two patients in the post-admission group were unable to complete the testing at time four because of complications post surgery. Therefore, two additional patients who met the inclusion criteria were included to replace those with incomplete data. Thus, complete data were obtained from a total of 52 patients; 26 patients in each of the pre and post admission groups.
Characteristics of sample

The following demographic data were analyzed: (1) age, (2) gender, (3) martial status, (4) education, (5) employment history, and (6) whether patients had contact with a close friend or relative who had undergone CABG surgery. Table 2 displays the demographic characteristics for the two groups.

For the total sample, the age ranged from 45 to 78 years, with a mean age of 60.2 years (SD= 9.37). The total sample consisted of 46 (88.4%) males and 6 (11.6%) females. The majority (73%) were married. The sample’s educational level varied: 16 (30.8%) had less than high school; 20 (38.5%) completed high school; 6 (11.5%) completed college; 7 (13.5%) completed a university degree; and 3 (5.8%) reported a post-graduate educational level. The employment status also varied: 22 (42.3%) were retired; 18 (34.6%) were employed; and 10 (19.2%) were not working related to their illness. Twenty-one (40%) participants reported knowing a family member or close friend who had undergone CABG surgery, while 31 (60%) did not.
Table 2

Characteristics of the Groups by Frequency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1 frequency (%)</th>
<th>Group 2 frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>5 (19.2%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>50-59</td>
<td>12 (46.2%)</td>
<td>10 (38.5%)</td>
</tr>
<tr>
<td>60-69</td>
<td>4 (15.4%)</td>
<td>8 (30.8%)</td>
</tr>
<tr>
<td>70-79</td>
<td>5 (19.2%)</td>
<td>7 (26.9%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24 (93.3%)</td>
<td>22 (84.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>2 (7.7%)</td>
<td>4 (15.4%)</td>
</tr>
<tr>
<td>Martial Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>2 (7.7%)</td>
<td>2 (7.7%)</td>
</tr>
<tr>
<td>Married/ Common-law</td>
<td>20 (77%)</td>
<td>18 (69.3%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (3.8%)</td>
<td>3 (11.5%)</td>
</tr>
<tr>
<td>Divorced / Separated</td>
<td>3 (11.5%)</td>
<td>3 (11.5%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>8 (30.8%)</td>
<td>8 (30.8%)</td>
</tr>
<tr>
<td>Completed high school</td>
<td>8 (30.8%)</td>
<td>12 (46.2%)</td>
</tr>
<tr>
<td>Completed college</td>
<td>2 (7.7%)</td>
<td>4 (15.4%)</td>
</tr>
<tr>
<td>Completed university</td>
<td>6 (23%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>2 (7.7%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>11 (42.4%)</td>
<td>7 (26.9%)</td>
</tr>
<tr>
<td>Not employed by choice</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1 (3.8%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>Retired</td>
<td>7 (26.9%)</td>
<td>15 (57.8%)</td>
</tr>
<tr>
<td>Not working related to</td>
<td>7 (26.9%)</td>
<td>3 (11.5%)</td>
</tr>
<tr>
<td>illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friend/ relative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (39%)</td>
<td>11 (42%)</td>
</tr>
<tr>
<td>No</td>
<td>16 (61%)</td>
<td>15 (58%)</td>
</tr>
</tbody>
</table>
The demographic characteristics of the two groups were examined to determine if they were equivalent. Independent sample t-test and chi-square test were used in the analyses, based on the variables' level of measurement. The results indicated no statistically significant difference, at \( p \leq .05 \), between the two groups on age, gender, marital status, education, employment and knowing someone who had CABG surgery. However, slight variations were seen between the two groups on the mean age, education and employment status. The mean age was 58 years (SD = 9.08) for patients in group 1 and 63 years (SD = 9.28) for patients in group 2. Comparisons of the means by t-test for independent samples showed no statistically significant difference between the two groups on age (\( t = .394, \) df=50, \( p > .05 \)). In terms of educational status, the preadmission group tended to have higher percent of patients who completed a university degree. Both groups had equal number of patients who had not completed high school; these differences were not statistically significant. Employment status varied between groups but was not statistically significant. Group 1 had the largest number of patients still working or not working related to current illness. The number of retired subjects in group 2 were about twice the number for group 1. Therefore, the two groups were comparable on demographic characteristics.

Additional data were collected on all patients related to pre-existing health status or co-morbidities. The three most common pre-existing conditions for all patients were: hypertension, diabetes and previous myocardial infarction. These occurred with similar frequencies for both groups of patients. Eight patients in group 1 and six in group 2 experienced hypertension. Five patients in group 1 and two in group 2 had previous myocardial infarction. The occurrence of diabetes was equal for both groups with seven patients in each group.

Postoperative complications such as; cerebral vascular accidents (CVA), myocardial
infarction, deep wound infection and general other complications were recorded. The number of complications arising following surgery were similar for both groups. One patient in group 1 (preadmission group) suffered a mild right CVA. One patient in group 2 suffered from acute delirium immediately following surgery which resolved by postoperative day four. Both patients were able to complete testing at T4.

Total Scores for Knowledge and Anxiety

Score Summary for Knowledge

Knowledge related to Coronary Artery Bypass (CABG) surgery, was measured using the CABG Surgery Knowledge Questionnaire (KQ). The KQ consisted of 20 multiple choice questions. Each question was assigned a score of one for a correct response and a score of zero for incorrect response. The total possible score was computed as the sum of the items' score; and could range from zero to 20. Knowledge was measured at three points in time: prior to attending the education session (T1), immediately following the education session (T2), and three to four days postoperatively (T4). Table 3 displays the frequency distribution for KQ for the two groups at each point in time.
Table 3

Frequency Distributions for Knowledge Scores

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>score range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6-10</td>
<td>3 (11%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11-15</td>
<td>16 (62%)</td>
<td>9 (35%)</td>
<td>7 (27%)</td>
</tr>
<tr>
<td>16-20</td>
<td>7 (27%)</td>
<td>17 (65%)</td>
<td>19 (73%)</td>
</tr>
<tr>
<td>total</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
</tr>
</tbody>
</table>

Group 2

|        |         |         |         |
| score range |         |         |         |
| 0-5    | 0       | 0       | 0       |
| 6-10   | 1 (4%)  | 1 (4%)  | 0       |
| 11-15  | 16 (62%)| 6 (23%) | 7 (27%) |
| 16-20  | 9 (35%) | 19 (73%)| 19 (73%)|
| total  | 26 (100%)| 26 (100%)| 26 (100%)|

The total knowledge score for both groups ranged from 6 to 20 across the three points in time. The majority of the patients had a score greater than 10 at T₁ (92%), at T₂ (98%) and at T₄ (100%). Higher scores were seen in both groups over time, with the percentage of patients scoring greater than 15 increasing from 30.7% at T₁ to 69.2% at T₂, and 73% at T₄.

The average knowledge score for the total sample was 14.4 (SD=2.3), 15.9 (SD=2.1) and
16.3 (SD=1.8) for T1 to T4 respectively. The mean knowledge scores for the two groups over time are presented in Table 4.

Table 4

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>14.0 (2.38)</td>
<td>15.9 (1.77)</td>
<td>16.0 (1.84)</td>
</tr>
<tr>
<td>Group 2</td>
<td>14.8 (2.25)</td>
<td>16.1 (2.45)</td>
<td>16.5 (1.92)</td>
</tr>
</tbody>
</table>

**Score Summary for Anxiety**

Anxiety was measured using the State Trait Anxiety Inventory at four different points in time: prior to attending pre-cardiac surgery education session (T1), immediately following the education session (T2), the morning of surgery (T3), and three to four days following surgery (T4). Five questions were randomly chosen from a possible set of 20 at each interval. Table 5 displays the frequency distributions for anxiety scores at each point in time for the two groups. The total possible score for anxiety could range from 5 to 20.
Table 5

Frequency Distributions for Anxiety Scores

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>score range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-8</td>
<td>10 (38.4%)</td>
<td>8 (30.8%)</td>
<td>9 (34.6%)</td>
<td>12 (46.2%)</td>
</tr>
<tr>
<td>9-12</td>
<td>11 (42.4%)</td>
<td>13 (50%)</td>
<td>12 (46.2%)</td>
<td>13 (50%)</td>
</tr>
<tr>
<td>13-16</td>
<td>5 (19.2%)</td>
<td>5 (19.2%)</td>
<td>5 (19.2%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>17-20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>total</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>score range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-8</td>
<td>12 (46.2%)</td>
<td>12 (46.2%)</td>
<td>11 (42.4%)</td>
<td>15 (57.8%)</td>
</tr>
<tr>
<td>9-12</td>
<td>9 (34.6%)</td>
<td>12 (46.2%)</td>
<td>9 (34.6%)</td>
<td>10 (38.4%)</td>
</tr>
<tr>
<td>13-16</td>
<td>5 (19.2%)</td>
<td>2 (7.6%)</td>
<td>5 (19.2%)</td>
<td>1 (3.8%)</td>
</tr>
<tr>
<td>17-20</td>
<td>0</td>
<td>0</td>
<td>1 (3.8%)</td>
<td>0</td>
</tr>
<tr>
<td>total</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
<td>26 (100%)</td>
</tr>
</tbody>
</table>

Total anxiety scores for patients in both groups ranged from 5 to 18. Normative data on anxiety scores using five questions from the STAI were not available. The lowest possible score of five indicates no anxiety. The highest possible score of 20 indicates high anxiety. For the purpose of this study, frequency scores have been summarized in equal intervals to represent the level of anxiety experienced by the patient. A score of five to eight indicates none to very low
levels of anxiety; nine to 12 indicates low anxiety; 13 to 16 indicates moderate anxiety; and scores above 17 indicate high levels of anxiety. The majority of participants’ score on anxiety was less than 10 across all points in time; T₁ (51.9%), T₂ (50%), T₃ (51.9%), and T₄ (75%). Very few subjects rated anxiety 16 or greater at any point in time; one (4%), 2 (8%), 2 (8%) and 0 (0%) for T₁ through T₄ respectively. The mean anxiety scores for the two groups over time are presented in Table 6.

Table 6

Mean and Standard Deviation Scores for Anxiety

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X (SD)</td>
<td>X (SD)</td>
<td>X (SD)</td>
<td>X (SD)</td>
</tr>
<tr>
<td>Group 1</td>
<td>9.5 (3.25)</td>
<td>9.6 (3.21)</td>
<td>9.3 (2.89)</td>
<td>8.3 (2.13)</td>
</tr>
<tr>
<td>Group 2</td>
<td>8.9 (3.14)</td>
<td>9.4 (2.67)</td>
<td>9.8 (3.57)</td>
<td>8.0 (2.55)</td>
</tr>
</tbody>
</table>

The mean for the total sample at each point in time were: 9.2 (SD=3.18), 9.6 (SD=2.95), 9.6 (SD=3.23) and 8.2 (SD=2.34) for T₁ through T₄ respectively.

Findings Related to the Research Hypotheses

Repeated measures analysis of variance (RM-ANOVA) was used to test the research hypotheses. The RM-ANOVA permitted examination of the differences between the two groups over the occasions of measurement. A mixed factorial design was used, incorporating a within-subject and between-subject factor. The within-subject factor tested whether differences in the mean scores occurred over time, regardless of the group. The between-subject factor tested whether differences existed between the groups regardless of the time of measurement. The
group x time interaction effect, tested whether the two groups’ mean scores changed over time in different ways.

Hypothesis 1

Individuals who received educational preparation on an out-patient basis and were admitted to hospital the morning of their surgery have higher levels of surgery-related knowledge both pre and postoperatively than individuals who received education on an in-patient basis and were admitted to the hospital the day of surgery. Table 7 displays the results of the RM-ANOVA for knowledge.

Table 7

Results of Repeated Measure Analysis of Variance for Knowledge

<table>
<thead>
<tr>
<th>Effect</th>
<th>F-ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>0.9</td>
<td>1,50</td>
<td>0.348</td>
</tr>
<tr>
<td>Time</td>
<td>22.1</td>
<td>2,49</td>
<td>0.000</td>
</tr>
<tr>
<td>Group x time</td>
<td>.41</td>
<td>2,49</td>
<td>0.668</td>
</tr>
</tbody>
</table>

Hypothesis 1 was not supported since the group x time interaction was not statistically significant. The results showed a statistically significant time effect indicating that the mean scores on knowledge changed over time in both groups. The group main effect was not statistically significant, indicating that the mean scores for the two groups did not differ.

A significant F-test for the time main effect indicated that changes in the mean scores for knowledge have occurred but did not point to where the significant changes lie. To determine at what point in time the change occurred, post hoc comparisons using t-tests for paired samples
was used. Conducting multiple tests on a small sample can increase the risk of type I error. To decrease the risk for type I error, an adjusted level of significance was set using the Bonferonni adjustment method. The level of significance, in this case .05, was divided by the total number of tests to be performed (i.e., 3 tests). The new level of significance for paired t-test analysis is .016. Results of the post-hoc comparisons for knowledge are summarized in Table 8.

Table 8

Paired t-test for Knowledge

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pairs</th>
<th>t-value</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>time 1 and 2</td>
<td>5.19</td>
<td>51</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>time 1 and 4</td>
<td>5.43</td>
<td>51</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>time 2 and 4</td>
<td>1.11</td>
<td>51</td>
<td>0.273</td>
</tr>
</tbody>
</table>

The results of paired t-test analysis revealed that statistically significant changes occurred in knowledge between $T_1$ (pre-test) and $T_2$ (immediately following education session). Increases in the mean scores on knowledge were seen after patients in both groups attended the education session. These increases in knowledge were sustained post-operatively as indicated by the significant differences between $T_1$ and $T_4$. There were no differences between the mean scores at $T_2$ and $T_4$.

Hypothesis 2

Individuals who received educational preparation on an out-patient basis and were admitted to hospital the morning of their surgery have lower levels of anxiety both pre and postoperatively than patients who received education on an in-patient basis and were admitted to
the hospital the day before surgery. Table 9 displays the results of the RM-ANOVA.

Table 9

Results of Repeated Measure Analysis of Variance for Anxiety

<table>
<thead>
<tr>
<th>Effect</th>
<th>F-ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>0.13</td>
<td>1.50</td>
<td>0.721</td>
</tr>
<tr>
<td>Time</td>
<td>4.22</td>
<td>3.48</td>
<td>0.007</td>
</tr>
<tr>
<td>Group x time</td>
<td>0.67</td>
<td>3.48</td>
<td>0.574</td>
</tr>
</tbody>
</table>

Hypothesis 2 was not supported since the group x time interaction effect was not statistically significant. Similar to the results for knowledge, the group main effect was not statistically significant for anxiety, indicating the mean scores on anxiety did not differ between the two groups. The time main effect was statistically significant, indicating that the mean scores on anxiety changed over time in both groups of patients.

To determine at what point in time the change in the mean anxiety scores occurred, post-hoc comparisons were conducted using paired t-test. As with knowledge, to reduce the chance of type I error, the level of significance was set at .008 since 6 paired t-tests were run. Results of the paired t-test comparisons for anxiety are summarized in Table 10.
Table 10

Paired Sample t-test for Anxiety

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pairs</th>
<th>t-value</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>time 1 and 2</td>
<td>1.04</td>
<td>51</td>
<td>0.303</td>
</tr>
<tr>
<td></td>
<td>time 1 and 3</td>
<td>0.84</td>
<td>51</td>
<td>0.403</td>
</tr>
<tr>
<td></td>
<td>time 1 and 4</td>
<td>1.92</td>
<td>51</td>
<td>0.061</td>
</tr>
<tr>
<td></td>
<td>time 2 and 3</td>
<td>0.30</td>
<td>51</td>
<td>0.764</td>
</tr>
<tr>
<td></td>
<td>time 2 and 4</td>
<td>3.2</td>
<td>51</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>time 3 and 4</td>
<td>2.92</td>
<td>51</td>
<td>0.005</td>
</tr>
</tbody>
</table>

The results of the paired t-test analysis showed that statistically significant changes occurred in anxiety between T₂ (immediately following education session) and T₄, as well as between T₃ (the morning of surgery) and T₄ (three to four days following surgery). The level of anxiety decreased significantly following surgery.

Summary

This chapter presented data collected from patients who were prepared for initial CABG surgery on an in-patient basis or through a preadmission clinic on an out-patient basis. There were no differences between the patients in the two groups in terms of age, gender, education, marital status, employment and contact with someone who had undergone CABG surgery. The study findings did not support hypothesis 1, which suggested that patients who were prepared for surgery as out-patients would experience more surgery related knowledge compared to in-patients. Significant changes in knowledge occurred over time, with the most significant increase
occurring following attendance at the cardiac surgery education session. Knowledge acquired was sustained three to four days following surgery.

Hypothesis 2, proposing that patients prepared as out-patients versus in-patients would have lower levels of anxiety across all points in time was not supported. There were no differences in anxiety scores regardless of how patients were prepared for surgery. As with knowledge, changes in anxiety did occur over time, with a significant decrease occurring three to four days postoperatively.
Chapter 4

Discussion

Introduction

The primary purpose of this study was to evaluate the effectiveness of a preoperative cardiac education program for patients who were prepared for surgery in a preadmission clinic, in reducing anxiety and increasing surgery-related knowledge. The theory of stress and coping developed by Lazarus and Folkman (1984), provided the conceptual framework for this study. Lazarus and Folkman contend that psychological stress can occur when the "environment is appraised by the individual as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p.19). Findings indicate that both groups of patients were equally prepared for CABG surgery. The patients who came to preadmission and spent the night before surgery at home reported no increases in anxiety compared to those patients admitted to hospital the night before surgery. Although these findings did not support the research hypotheses, they do support the continued benefits of preparing patients as outpatients in comparison to those admitted to hospital. The study findings are discussed in relation to the conceptual framework and the existing body of literature.

Characteristics of the sample

Fifty-two patients were selected by convenience sampling for this study. Each of the out-patient and in-patient group consisted of 26 patients. The results of this study indicated that the groups of patients were comparable in terms of: age, gender, marital status, education, employment status, knowing someone who had surgery, pre-existing health status and postoperative complications. The characteristics of the study sample were similar to CABG
surgery patients reported in the literature with the exception of gender. Lepczyk, et al (1990) reported 92% of the participants as male, Cupples (1991) reported 95% male participants. In this study, 88% were male. One possible explanation for the increase in female patients could be related to changes in diagnosis and treatment of female cardiac patients over the past few years since many of the studies were conducted. Using the data base of the hospital where primary data collection took place, comparisons were made between the study sample and the overall initial CABG surgery patients with respect to age, gender and marital status. Hospital data base random sampling of 100 patients who were admitted for initial CABG surgery showed; mean age for all patients 63, 85% of patients were male, and greater than 50% were married. The study sample characteristics were consistent with the overall profile of patients admitted for initial CABG surgery within the hospital.

Surgery Related Knowledge

Previous research has shown that patients who receive preoperative education are better prepared for surgery and have more positive outcomes compared with those patients who do not receive instruction (Anderson, 1987; Cupples, 1991; Hathaway, 1986; Lindeman, 1988; Moyer, 1994). With some evidence that preoperative education provided advantage to patients, researchers began to explore the impact and potential benefit of providing preoperative education earlier than the traditional night before surgery (Christopherson & Pfeiffer, 1980; Cupples, 1991; Recker, 1994). Researchers speculated that if surgery-related information was given prior to admission to hospital, patients would feel better prepared for surgery and have more positive surgery-related outcomes (Cupples, 1991; Rice, Mulllins & Jarosz, 1992). These speculations were based on the notion that patients would be less anxious and more ready to hear information.
In addition, a number of factors beyond the potential benefit of increased surgery-related information influenced the rapid development of preadmissions clinics across the country. Many hospitals faced reduced funding resources from both the provincial and federal governments: preadmission clinics were seen as a possible method to improve bed utilization and reduce length of stay, resulting in cost containment and reduction. Although preadmission clinics have been present within the health care system for more than a decade in some places, little empirical evidence was available to understand the impact of providing education earlier in the process of preparing patients for surgery.

This study, similar to others, explored the benefits of providing cardiac surgery patients with information one to 14 days prior to their surgery. The results of this study did not support the hypothesis that patients who were prepared as out-patients would have higher levels of knowledge recall both pre and postoperatively compared to patients who were prepared as in-patients. The group main effect and the group x time effect were not significant, indicating that there were no differences between the groups regardless of time and that the groups did not change over time in different ways with respect to knowledge. One statistically significant finding related to knowledge was that of the time effect. The results indicated that the mean scores on knowledge changed over time for all patients. Paired t-test analysis revealed that the greatest change in knowledge occurred between T₁ and T₂. These findings indicate that following attendance at the educational session, knowledge was higher and this increase was maintained during the postoperative phase for both groups of patients.

In terms of preoperative knowledge, frequency distribution and mean scores for both groups were similar at T₁. All patients tended to have a moderate to high level of knowledge prior
to attending any educational session. This finding is similar to the work of Lepczyk, et al (1990). In their study they noted that all participants tended to have moderate levels of knowledge. They speculated that heart surgery patients may be "knowledge seekers" and they may have sought information before attending any formal session. In addition, by the nature of their illness and the specialty nature of the health care system, patients having CABG surgery would have had consultation with a cardiologist and undergone a series of specialized tests. This would be followed by consultation with a cardiac surgeon where a decision would be made about proceeding with surgery. This decision would be made based on a discussion regarding the risks and benefits of surgery. Throughout this process, patients may also have received written material regarding their illness. Therefore, the process leading up to CABG surgery would provide the patient with opportunities to seek and receive information regarding surgery.

Following attendance at the educational session, knowledge scores were higher for both groups of patients. The results indicated that the amount of knowledge was not impacted by the group to which the patients belonged in the preoperative phase. Attendance at the educational session resulted in an increase in knowledge, regardless of when it was provided. The results of this study did not support the findings of previous researchers who reported that patients who received information on an out-patient basis prior to admission to hospital demonstrated higher levels of surgery-related knowledge, compared to those who received information on admission to hospital for surgery the night before (Christopherson & Pfeiffer, 1980; Cupples, 1991; Lepczyk, et al, 1990; Rice, et al, 1992). In addition, Lepczyk, et al (1990) reported higher knowledge scores were associated with patients who had contact with a relative or close friend who had undergone cardiac surgery. In this study the number of patients who had contact with a
relative or close friend who had undergone cardiac surgery were similar for both groups. The results of independent t-tests showed no statistically significant difference in knowledge scores at T₁, T₂ and T₄ between patients who had contact with someone who had undergone surgery and those who did not.

A number of factors may have contributed to the lack of significant differences in knowledge between the two groups over time compared to other studies. These factors include: study design, methodology, sample size and measurement. In other studies, despite the fact that patients were given information prior to hospital admission, variable methods of preoperative education delivery were used. In many studies the experimental group received additional or different information compared to the control group. Patients were admitted to hospital the night before surgery and again received some type of instruction regardless of whether they had attended a preadmission session and received prior information (Christopherson & Pfeiffer, 1980; Cupples, 1991; Rice et al, 1992). In another study, the person who presented the information to the out-patient group was not the same as the in-hospital group presenter (Cupples, 1991). Often, the researcher, who could be considered a clinical expert, developed the content for education material to be given to the preadmission group (Christopherson & Pfeiffer, 1980; Cupples, 1991; Rice et al, 1992). The preadmission patients may have benefited from different teaching style, knowledge or skill level of the researcher compared to the in-hospital groups. In Cupples (1991) study, the researcher also telephoned to answer any questions that may have arisen after attendance at the education session, prior to admission to hospital. One could possibly conclude that the content, personal contact and the skill of the educator may explain the differences seen between patients prepared for surgery as out-patients versus in-patients rather than when the
information was provided. In this study the education sessions were the same for all patients regardless of the mode of admission to hospital. Each patient watched a preoperative cardiac surgery video for approximately 20 minutes. Following the video a staff nurse from the post-surgical intensive care unit or the in-patient unit followed a standardized checklist of items to review from the video, followed by an open forum for questions. Unlike the studies reviewed, in this study, the content, mode of delivery and presenters were consistent for all patients. These factors may have accounted for the non-significant differences between the groups.

The sample size for this study was determined by power analysis to provide an estimate of the minimum number of subjects needed to complete the study. A sample of 52 patients while adequate by power analysis for this study still represents a small sample size. Caution must be used when interpreting the finding of studies with small sample size and with multiple comparisons because of the risk of type I error. To control for the risk of error in this study, where additional statistical tests were run for post-hoc analysis, a stringent level of significance was set (.008 and .016).

The measurement tools used in this study were reported in other studies to be reliable and valid. The Knowledge Questionnaire was developed by Cupples (1991), to measure the amount of surgery related knowledge in initial CABG surgery patients. Cupples (1991) reported coefficient alpha for the KQ at 0.71 and a two week test-retest reliability at 0.87. Alpha for the KQ in this study was found to be 0.45, 0.57 and 0.47 for T₁, T₂ and T₄ respectively. Although minor changes were made to the questionnaire in terms for reading level and appropriate content for study site, it was felt by the researcher that the impact on reliability was minimal. One possible explanation for the low alpha level could be related to the high level of knowledge for
all patients. Most patients answered the questions correctly with little variability; this low variability could explain the observed low alpha levels (Polit & Hungler, 1983). In addition, alpha reliability levels measure inter-relationship among items. Lower alpha levels could be because the items are tapping different domains of knowledge (Polit & Hungler, 1983).

In the postoperative phase, all patients continued to report moderate to high levels of knowledge independent of the group to which they belonged. Unlike this study, other researchers who investigated preoperative knowledge chose not to measure knowledge in the postoperative phase. Only one study was found that investigated postoperative knowledge. Similar to this study's finding, Christopherson and Pfeiffer (1980), found that patients demonstrated no significant differences in the amount of recall based on whether information had been given on an out-patient versus post-hospital admission basis.

Anxiety Levels

The State Trait Anxiety Inventory, State-Form was used to measure anxiety. It has been reported to have an alpha reliability coefficient ranging from 0.83 to 0.92 with use of entire 20 item questionnaire. In this study, the alpha reliability for the five item measure was recorded at 0.62, 0.64, 0.73 and 0.58 for T1 through T4. As with knowledge this low reliability alpha could possibly be a result of all patients answering the questions in a similar manner. Little variability could have therefore reduced the alpha level (Polit & Hungler, 1983). In addition, the use of a small number of items, five questions from a possible set of 20, may have also reduced the variability of scores and in turn lowered the reliability.

Researchers investigating both preoperative educational programs and anxiety reported that patients who received instructions on an out-patient basis tended to experience lower levels
of preoperative anxiety than those prepared for surgery as in-patients (Christopherson & Pfeiffer, 1980; Cupples, 1991; Hill, 1989; Rice, et al 1992). This study’s hypothesis stating that individuals who were prepared as out-patients and admitted to hospital the morning of surgery would experience lower levels of pre and postoperative anxiety was not supported. The results of the study indicated that there were no differences between the preadmission and post-hospital admission groups on frequency distributions and mean score of anxiety. Repeated measure analysis of variance provided findings similar to those of knowledge. The groups did not change in different ways over time and the group to which the patients belonged did not impact on anxiety scores.

Similar to knowledge, time was the only statistically significant factor for anxiety levels. Patients tended to experience similar anxiety levels in the preoperative phase regardless of how they were prepared for surgery. Significant differences were present in anxiety scores between $T_2$ and $T_4$, and $T_3$ and $T_4$. These findings indicate that for all patients, anxiety levels were similar before surgery with a statistically significant decrease seen in the postoperative phase.

This study did not reveal a reduction in anxiety for patients prepared for surgery on an out-patient basis versus those admitted to hospital. The results of this study were similar to the work of Lepczyk, et al (1990). On the other hand, the findings did not support the work of previous researchers who reported that patients prepared on an out-patient basis reported lower levels of preoperative anxiety (Christopherson & Pfeiffer, 1980; Cupples, 1991; Rice, et al, 1992). One possible explanation for low levels of preoperative anxiety could be related to the effect of waiting for surgery. Cardiac surgery patients are often informed that they require surgery months before their scheduled date. Low levels of anxiety in the immediate preoperative phase
may reflect a feeling that the waiting is almost over.

A number of factors may have contributed to the lack of significant differences in anxiety between the two groups over time compared to other studies. Study design and methodology may have influenced reductions in anxiety rather than the timing of when information was provided. In the case of Cupples (1991), the researcher not only conducted the educational sessions, but also contacted the preadmission group by telephone to answer any questions they may have had since their first meeting. This personal contact with a consistent knowledgeable individual may have played a role in reducing their anxiety. In this study, a staff nurse who had no prior contact with the patient provided the information during all education sessions regardless of how he/she was prepared for surgery.

In many of the reported studies, participants were obtained from referral from the surgeon’s office. Perhaps these individuals may have felt more confident in their care and recovery because of the perception of the researchers’ connection to the surgeon’s office. In this study, the patients were first approached for participation by a nurse in the preadmission clinic or the day of admission to hospital. No patients were approached for participation from the surgeon’s office.

In the postoperative phase, all patients in this study continued to report some level of anxiety. Similar to findings of other studies, the preparation CABG surgery patients received on an out-patient versus in-patient basis appears to have had no impact on their postoperative anxiety levels (Christopherson & Pfeiffer, 1980; 1990; Cupples, 1991).

In all studies reviewed, including those with favourable findings related to reduction in anxiety in preadmission patients, variable designs were used. Those included: different types of
information, timing of when the information was provided, method of its delivery and timing of testing or measuring the outcome variables. Although some researchers contend that anxiety would be at its peak as surgery approached, none of the studies tested anxiety the morning of surgery. In this study, anxiety level was measured the morning of surgery and found not to increase significantly from other times of testing.

Many researchers contend that the nature of cardiac surgery and associated risk factors are so stressful that information regardless of when given, has little impact on negative feelings (Anderson, 1987; Cupples, 1991; Rice, Mullins & Jarosz, 1992). If CABG surgery patients are prone to experience stressful situations differently, the instrument used in this study (STAI-state form) may be inadequate to capture true meaning of the situation. Perhaps the overall personality traits of the individual are more important indicators of coping rather than current emotional states. Kinney (1977) and Anderson (1987), speculated that it is important to understand personality traits of individuals and type of surgery they are undergoing when interpreting anxiety scores. Kinney speculated that traits of individuals is the most important factor, while Anderson surmised that perceived control is the deciding factor for reducing fears and anxiety in cardiac surgery patients. None of the studies reviewed, nor this one examined those factors which could have possibly influenced anxiety scores.

Stress and Coping

The theory of stress and coping by Lazarus and Folkman (1984), guided the conceptual development of this study. According to Lazarus and Folkman (1984), when people encounter a stressful situation, as in pending cardiac surgery, they appraise what can be done to cope with the situation. The cognitive appraisal process occurs at the conscious or unconscious level. At the
conscious level, appraisal can help to give understanding or meaning to the situation in terms of his or her well-being. In cardiac surgery the loss or harm of heart disease with the pending threat of surgery can be characterized by "negative emotions such as fear, anxiety or anger" (Lazarus & Folkman, 1984, p.33). While the threat and challenge appraisals are not seen as mutually exclusive, perhaps the hopefulness of a new life following cardiac surgery is not enough to overcome negative emotions such as anxiety. In this study, patients tended to experience very low to low levels of anxiety throughout each of the testing periods. Following surgery at T₁ there was a statistically significant drop in anxiety for all patients, with a mean level of 8.2, indicating a very low level of anxiety. A score of five at this phase would have indicated no anxiety. Given that low levels of anxiety existed, one possible explanation may be that a mild threat still exists or new challenges have occurred. It is quite possible the latter is the case. While patients may have been concerned and anxious preoperatively regarding impending surgery, in the postoperative phase their concerns may be equally taxing but of a different nature. Three to four days following surgery they may be contemplating issues related to recovery and discharge from hospital.

The secondary appraisal is the time when people evaluate what can be done to deal with the situation. In the case of patients preparing for cardiac surgery, they may use problem-solving skills to evaluate if information about heart surgery can be applied to the situation and used as an effective strategy to deal with the demands of the situation. Although it was earlier thought that preoperative education may be seen by patients as a coping option to help them facilitate their recovery, perhaps this linkage was too simplistic given the nature of cardiac surgery. It was clear in this study that although patients tended to have moderate to high levels of surgery related
knowledge, there was no apparent reductions seen in anxiety. One possible explanation for the lack of significant reduction in anxiety may simply be that the anxiety levels were not high enough to see significant changes. Although Lepczyk, et al (1990) reported that patients preparing for CABG surgery experienced moderate to high levels of preoperative anxiety, this was not supported in this study. Another possible explanation could be that anxiety levels did not significantly rise because of effective coping by individuals. As individuals cope with new and/or threatening events, effective coping results in positive emotions (Lararus & Folkman, 1984). "The dynamics and change that characterize the coping process are a function of the continuous appraisal and reappraisal of the shifting person-environment relationship" (Lazarus & Folkman, 1984, p. 142). In the case of cardiac surgery patients, the information provided in pre-surgery education sessions may have been very useful to patients. One could speculate that the experience of others, which was shared in the education sessions, may have helped buffer some of the negative emotions of surgery. In addition, the waiting factor is soon to be over. For these patients who perhaps had experienced extended waiting period prior to surgery, this time may be viewed as a relief of coming events and therefore reduce anxiety.

The importance of the individual's appraisal cannot be underrated and perhaps no amount of explanation can help with the experience of individuals. It is interesting to note there was no significant change in anxiety at the same time that knowledge was increased, immediately following attendance at the educational session. Perhaps the benefit of surgery related knowledge is overrated by health care providers in terms of its effectiveness in reducing anxiety and preparing patients for surgery. Perhaps the nature, content, method and skill of the educator are factors which cannot be overlooked given not only the factual but also sensory nature of helping
patients prepare for the physical as well as the psychological events of heart surgery.

Summary of Discussion

Two groups of patients preparing for initial CABG surgery were included in this study to examine the effect of a pre-cardiac surgery education program offered on an out-patient versus in-patient preparation method. The two groups were similar in terms of all profile information. The most important study findings was that changes occurred in knowledge and anxiety for all patients regardless of the group to which they belonged. Mean knowledge scores remained high through out all testing with statistically significant increases seen immediately following attendance at the educational session. Anxiety scores showed that no differences existed between the patient groups investigated. Anxiety levels were similar for all patients during the preoperative phase with a significant decrease in the postoperative period. The findings were examined in light of the theory of Stress and Coping as developed by Lazarus and Folkman (1984). The theory may explain some of the study findings in terms of how cardiac surgery could be perceived as a threatening event. At the same time it may have also heightened the complexities of understanding how individuals cope when preparing for surgery.

Limitations of the Study

The study found that patients who were prepared for CABG surgery as out-patients in a preadmission clinic were equally prepared for surgery as those admitted to hospital the night before surgery. This investigation showed that patients from both groups were similar in terms of knowledge and anxiety. Failure to find significant findings related to the study hypotheses may be due to methodological factors such as study design, sample selection, sample size, and measurement.
The use of quasi-experimental design facilitates the search for cause and effect in situations where complete control is not always possible (Burns & Grove, 1993). With this type of design there is an assumption that a certain treatment or intervention will lead to a cause or outcome. However, unlike a pure experimental design obtaining a true effect of a treatment is not always possible because of extraneous variables. In the case of patients preparing for cardiac surgery extraneous variables such as: public perception of heart surgery, media imaging and social support or network, none of which could have been controlled, may have influenced the study’s outcomes. Although these factors may have influenced both groups equally in terms of outcomes, it may have also raised the level of baseline knowledge beyond what was initially expected. In turn, as patients knowledge about upcoming surgery increased this may have had a direct impact on the amount of anxiety levels people experienced. In social health and science it is important to recognize the interrelationships among multiple variables when examining study findings. Given the complex nature of preparing for cardiac surgery and study design it is important to exert caution when interpreting the findings.

Although demographic characteristics of the study sample were comparable to the general target population, the relatively small and non-random sample used for this study may have resulted in sampling bias. The surgeons who initially interviewed the patients made decisions about whether the patients should be booked through the preadmission clinic or admitted to hospital. Data on co-morbid diseases such as diabetes, renal failure and heart failure were collected with no differences seen between the two groups. Often there was no clear reason as to why patients were not seen in the preadmission clinic; other than their place of residence, physician or patient choice. Motivation for patients to request admission to hospital prior to
surgery have not been explored, but may have played a role in understanding and interpreting study findings. Perhaps those patients who requested admission to hospital would have experienced higher levels of anxiety by staying at home if they were not permitted admission to hospital until the morning of surgery. Recruitment of subjects was limited to patients who could read and speak English and data collection took place primarily at one hospital site. Unfortunately the cardiac database at the primary site of data collection does not track ethnic backgrounds of patients. Therefore we cannot compare the ethnic background of study subjects with a larger population. Given the multi-cultural environment of the metropolitan city where data collection took place a number of people may not be able to speak or read English and therefore not given the opportunity to participate in the study. This raises questions regarding cultural bias and importance of information. Factors such as language, culture, personal desires to stay in hospital prior to surgery could have impacted on the study findings and should be taken into consideration when interpreting the results.

The validity and reliability of the instruments used in this study were reported by previous researchers; however the alpha coefficient levels were low in this study for both the KQ and the STAI. One possible explanation for low alpha levels could be related to subjects answering most questions in the same way. The validity of using the KQ for postoperative measurement has not been conclusively established. In particular, very few of the questions asked were related to postoperative recovery. A literature search did not reveal the existence of instruments that measured knowledge in the postoperative phase, therefore the decision was made to use the same questionnaire three to four days following surgery. This may have affected the accuracy of the measures obtained in the study. Measurement error, related to the relevance of questions
surrounding preoperative knowledge in the postoperative phase, cannot be ruled out. In addition, patients in the postoperative phase would have practical knowledge of some of the experiences asked in the KQ.

With the use of repeated measure design, both the KQ and the STAI were administered on a number of occasions. A set of five random questions form the STAI were used at each testing interval, which minimized the threat of retesting. However, the KQ was administered in the same fashion and perhaps the familiarity with the questions or format could have influenced the results.

Although the study hypotheses were not supported, it is important to point out that this study does offer empirical evidence that patients are not adversely affected by receiving educational instruction as out-patients and spending the night before surgery at home. Regardless of how patients were prepared there were no significant differences seen in their level of knowledge or anxiety.
Chapter 5

Summary, Implications and Conclusion

Introduction

In this study, data were collected from a convenience sample of 52 patients who had undergone initial Coronary Artery Bypass Graft Surgery (CABG). Twenty-six patients were prepared for cardiac surgery on an out-patient basis and admitted to hospital the morning of surgery. The comparison group of patients were prepared for cardiac surgery in the traditional method of admittance to hospital and receiving educational preparation the night before surgery. Anxiety was measured with the State Trait Anxiety Inventory (STAI) and knowledge was measured with a CABG surgery Knowledge Questionnaire (KQ). RM-ANOVA was used to test the research hypotheses.

There were no differences between the groups in terms of age, gender, marital status, education, employment status, knowing someone who had undergone surgery, pre-existing health status and postoperative complications. The study hypotheses related to knowledge and anxiety were not supported by the findings. There were no differences seen between the groups at any point of testing. While the preadmission group received cardiac surgery information one to 14 days prior to surgery and spent the night before surgery at home, the amount of knowledge or anxiety level experienced was not significantly different from those patients admitted to hospital and receiving information the night before surgery.

The time effect was statistically significant for both knowledge and anxiety. All patients experienced a significant increase in knowledge immediately following attendance at the educational session. The increase in knowledge was sustained at the time of final testing in the
postoperative period. Similarly, anxiety levels changed over time for all patients. There was no difference in anxiety levels between the groups in the preoperative phase. There was a statistically significant decrease in anxiety for all patients three to four days following surgery.

Implications

This study has implications for practice, theory and further research with patients preparing for cardiac surgery.

Practice

Findings from this study identified that the method of preparation for cardiac surgery patients did not impact the amount of knowledge and anxiety patients experienced. In the early phase of preadmission, physicians were sometimes reluctant to admit patients to hospital the morning of their procedure for fear that they would not be adequately prepared. While most hospitals have fully endorsed the use of preadmission clinics, skepticism still exists as to whether patients are as prepared for surgery as those admitted to hospital. Studies such as this, offer empirical evidence that patients prepared as out-patients are as prepared as those admitted to hospital the night before surgery. The reality for many institutions is that preadmission clinics will continue to increase as services shift to out-patient settings in efforts to contain cost and improve bed utilization. As a result, the amount of available time with patients may be reduced for education. With limitations on time available for education, healthcare providers need to review and examine what information is being provided and whether it is achieving the desired outcome. In this study, the majority of CABG surgery patients appeared to have moderate to high levels of knowledge regarding cardiac surgery. This study highlights the need for nurses to assess the amount of knowledge patients have in order to make information sharing as meaningful as
possible. The challenge for nurses will be to search for improvements in educational material beyond basic transfers of information and to individualize education sessions based on existing knowledge.

**Theory**

The theory of Stress and Coping by Lazarus and Folkman (1984), provided the conceptual framework for this study. The study findings offer some insight into the complex nature of cardiac surgery and subsequent stress and coping. It was proposed that education provided to surgery patients could be used as a coping strategy to overcome the negative emotions, such as anxiety, associated with a stressful situation. The findings of this study showed that all patients tended to experience a very low to low level of anxiety. This raises questions regarding the multifactorial cause of stress and how individuals appraise what can be done to deal with the upcoming events of surgery. Many CABG surgery patients know well in advance that surgery is pending, perhaps by the time they meet with nurses, one to 14 days prior to surgery, they have already discovered effective ways to cope with their illness.

**Research**

The study findings have generated the following recommendations for future research:

1. Replication of the study using a larger sample size and additional study variables. Although the study findings did not support the hypothesis that preadmission patients would experience greater levels of knowledge and lower anxiety levels, the findings indicate that preparing patients as out-patients for surgery is as effective as admitting them to hospital. Future studies could explore whether differences exist between these patient groups beyond anxiety and knowledge.
Concepts such as mood state, coping and satisfaction with care could be explored.

2. In this study, all patients tended to have moderate to high levels of knowledge; at the same time they experienced no difference in levels of anxiety. Feeling well informed may reduce certain fears but impact little on anxiety. Future studies could explore the relationship between knowledge and anxiety.

3. Exploration of the benefit of providing preoperative education. Future studies could examine the possible relationship between being well informed and behaviour or recovery indicators. Anderson (1987), contends that for cardiac surgery patients it is more important for them to feel in control than well informed. Therefore, other than just providing information on what to expect, education should be given as to promote a perception of control especially in the recovery process.

Conclusion

This study compared knowledge and anxiety levels of patients who were undergoing initial CABG surgery. Comparison was made between patients who were prepared as out-patients seven to 14 days prior to surgery and admitted the morning of their operation to those who were admitted to hospital and given instructions the night before surgery. The study findings indicate that the preadmission group were no different than those patients admitted to hospital. All patients were well informed and experienced reduced levels of anxiety in the postoperative phase.
References


Appendix A
Description of Educational Programs

Preoperative Phase

Prior to scheduled elective cardiac surgery, patients were assessed for learning needs during the preoperative period. Whether patients were prepared in out-patient ambulatory care settings or in-patient hospital settings the preparation is the same. Upon admission to ambulatory care or hospital all patients meet with a registered nurse for history taking and information sharing regarding upcoming surgery. All patients viewed a preoperative teaching video which concentrates information sharing on a number of items:

Preparing for surgery:
- General routines and introduction of team members providing care.
- Health history taking and diagnostic investigation.
- What to do before surgery and what to bring to the hospital (ie, nothing by mouth after midnight and how to take medications).
- Routines to expect upon hospital admission.

The operation:
- Description of surgery (ie chest bone wired together), given by surgeon.
- Care following surgery related to ICU and ward routines (ie breathing tube, chest tubes, bladder tube and length of stay).

Recovery:
- Exercises and postoperative activity (ie deep breathing and coughing).
- Dealing with postoperative pain.
- Incision care.

Progressive Activity:
- Breathing exercises.
- Caring for hygiene needs.
- Walking with progressive increases.
- Getting ready for discharge.

Following the viewing of the preoperative video, patients are given an opportunity to ask a registered nurse questions and have information clarified.
Appendix B
Coronary Artery Bypass
Graft Knowledge Questionnaire

Please circle the number of the response which best answers each question. There is only one correct answer for each question.

1. The coronary arteries that will be bypassed are located:
   1) inside your heart
   2) on the outside surface of your heart
   3) both inside and outside your heart
   4) in your lungs

2. The reason for your operation is to bypass your blocked coronary arteries which will:
   1) improve blood flow to your lungs
   2) improve blood flow to your heart muscle
   3) improve blood flow to your heart valves
   4) remove the blockages from your coronary arteries

3. The veins used to bypass your blocked coronary arteries will be taken from:
   1) your back
   2) your leg (s)
   3) your stomach
   4) your neck

4. Which of the following statements about your operation is false?
   1. the exact number of coronary artery blockages that will be bypassed will be decided during the operation
   2. the heart-lung machine will supply oxygen for your body during the operation
   3. the internal mammary artery may be used for a bypass graft
   4. the bypass operation will remove the blockages from your coronary arteries

5. At the end of the operation, your breastbone will be:
   1) wired together
   2) sutured together
   3) stapled together
   4) left open

6. Which of the following will you do the day before surgery:
   1) You will be asked to shower with special soap
   2) You will be asked to shave all body hair
   3) You will be asked to eat a large meal
   4) You will be asked not to take any medications
7. Which of the following statements about your heart medications is true? After admission to the hospital:
   1) You should take your heart medications just as you would at home
   2) Your nurse will give you your heart medications
   3) You will not have to take any heart medications
   4) You will be given new heart medications in preparation for surgery

8. The night before surgery, you may not have anything to eat or drink after:
   1) dinner
   2) 9 p.m.
   3) midnight
   4) 3 a.m.

9. Which statement about the day of your operation is false?
   1) Your family cannot visit you in your room the morning of your operation
   2) The operation takes about 3 to 4 hours
   3) The surgeon will talk with your family after the operation.
   4) You will not be permitted to eat

10. Which statement about the day of your operation is false?
    1) The anaesthetic will be given through the I.V.
    2) An oxygen mask will be put over your nose and mouth
    3) A tube will be inserted into your bladder to drain urine
    4) Your chest and legs will not be shaved.

11. When your operation is over, you will go directly to:
    1) the discharge area
    2) the intensive care unit (ICU)
    3) the regular ward room
    4) the Coronary Care Step-Down Unit

12. Which statement about your experience immediately after the operation is false?
    1) You won't be able to talk because of the breathing tube in your mouth
    2) The ventilator will breathe for you until you are strong enough to breathe deeply on your own
    3) After your operation, you will sleep for most of the day
    4) You will be on the heart-lung machine for a day after your operation

13. All of the following are possible postoperative complications except:
    1) wound infection
    2) heart rhythm disturbances
    3) bleeding
    4) appendicitis
14. After your operation, deep breathing and coughing help to do all of the following except:
   1) prevent respiratory (breathing) complications
   2) strengthen your vocal cords
   3) keep your air passages clear of secretions
   4) keep your lungs expanded

15. Your chest drainage tubes are usually removed:
   1) when you leave the operating room
   2) one or two days after surgery
   3) six days after surgery
   4) eight days after surgery

16. Which statement is false? After your surgery, you may have some pain:
   1) in the area of your chest incision
   2) in your leg
   3) try to "grin and bear it"
   4) pain medication requests can be made to the nurse

17. Which statement is false?
   1) There will be some bloody drainage from your chest tube
   2) After the breathing tube is removed, you can have liquids and then advance to a regular diet
   3) You may feel weak and should call for help before getting out of bed for the first time
   4) You are not allowed out of bed until four days after surgery

18. The breathing tube will probably be removed:
   1) when you leave the operating room
   2) within 24 hours of your operation
   3) three days after the surgery
   4) four days after the surgery.

19. What should you not do after surgery:
   1) change position in bed every one to two hours
   2) take deep breaths and cough every one to two hours
   3) increase your walking distance each day
   4) lie as still as possible.
20. Most bypass surgery patients are discharged from the hospital:
   1) four to five days after surgery
   2) seven to ten days after the surgery
   3) twelve days after the surgery
   4) fourteen days after surgery.
Appendix C
Section A: completed by patient
Patient Profile Form

Code/ Group __________

Date of Birth: __________

Sex: (1) Male
     (2) Female

Marital Status: (1) Single
               (2) Married
               (3) Widowed
               (4) Separated
               (5) Divorced
               (6) Common-Law

Education: (1) Less than high school
           (2) Completed high school
           (3) Completed college
           (4) Completed university
           (5) Post-graduate

Has anyone else in your family or a friend undergone coronary artery bypass Graft surgery:
     (1) Yes
     (2) No

Occupation: ________________

Work Status:
     (1) Employed
     (2) Not employed by choice
     (3) Unemployed
     (4) Retired
     (5) Not working related to current illness
     (6) Not working related to other illness
Appendix D
Section B: completed by researcher
Patient Profile Form

Date of preadmission visit: ______________

Date of hospital admission: ______________

Date of surgery: ______________

Pre-existing health status: ________________________________

Complications arising from surgery:

1. Stroke
2. MI
3. Deep wound infection
4. ICU stay greater than 24 hours
5. Other: 
Appendix E
Designate's Request for Consent To Be
Approached By Graduate Student

Mr. / Ms. , Cynthia Davis is a graduate student in the Department of Nursing Science at the University of Toronto, who would like to talk with you about a study she is conducting.

The purpose of this study is to learn more about the most effective method and time of giving preoperative teaching. If you would be willing to talk with Ms. Davis, she will tell you more about the study and what your participation would involve.

Agreeing to meet with Ms. Davis does not mean that you have agreed to participate in this study, only that you are willing to hear more about the details of the study.

Whether or not you agree to meet with Ms. Davis will in no way affect the care you receive here at . Would you be willing to meet with Ms. Davis to learn more about the study? May I give Cynthia your name?
Appendix F
Information Sheet

Mr. / Ms., My name is Cynthia Daviq, I am a graduate student at the University of Toronto in the Faculty of Nursing. My supervisor is Dr. S.Sidani, a faculty member at the University of Toronto.

The main purpose of this study is to find out what is the best way to help people get ready for bypass surgery. This study will include two groups: the first group includes people who attend preadmission programs and are admitted to hospital the morning of surgery while the second group include people who are admitted to hospital the day before their operation.

Your participation in this study will involve completing a number of brief questionnaires before your preoperative education class. The questionnaires ask personal information about yourself including: your date of birth, your knowledge of the surgery and how you feel. Following the education class you will be asked to complete two of the same questionnaires. The time required to complete the questions will take approximately 20 minutes. The morning of surgery you will be asked to answer a questionnaire that will take approximately 5 minutes about how you feel. Between three to four days after surgery you will be asked to complete two questionnaires which will take approximately 15 minutes about your knowledge of the surgery and how you feel. Your answers will be recorded on the questionnaires. I would also like permission to obtain information from your chart regarding your surgery and recovery.

Your decision to participate in this study will in no way affect the care that you receive from your doctors, nurses or the hospital. If you choose to participate, you may change your mind and withdraw from the study at any time. You may also refuse to answer any or all of the questions that you were asked to complete.

Your name will not appear on any form or in any report of this study. Your responses and chart information will remain confidential and not discussed with any of the doctors, nurses or hospital staff.

While you will not personally benefit from participating in the study, information which you provide may help others who require CABG surgery in the future. If you are interested, I would be happy to share the results of this study with you when completed.

Do you have any questions about the study?

Would you be willing to participate in the study?
Appendix G
Consent to participate in a Research Study

Evaluation of a pre-cardiac surgery educational program offered in an ambulatory care unit.

Principal Investigator:
Cynthia Davis R.N., MsC(c).

I, ____________________, consent to participate in a study conducted by Cynthia Davis a graduate student at the Faculty of Nursing, University of Toronto who will investigate the best way to help people get ready for heart surgery. I understand that Cynthia Davis will be supervised during the study by Dr. S. Sidani, at the University of Toronto (416-978-2730).

I understand that participation in this study will involve completion of a number of questionnaires before attending preoperative education class. The questionnaires ask questions about personal information such as: date of birth, my knowledge of the surgery and about how I feel. Following the education class I will be asked to complete two of the same questionnaires. The time required to complete the questions will take approximately 20 minutes.

I understand that the morning of surgery I will be asked to answer 5 questions that will take approximately 5 minutes about how I feel. Between three to four days after surgery I will be asked to complete the same two questionnaires I have completed earlier, which will take approximately 15 minutes. My answers will be recorded on the questionnaires. I agree that Ms. Davis may obtain the following information from my hospital record: regarding other medical conditions (such as diabetes and elevated blood pressure) and my progress after surgery while I was in the Intensive Care Unit and in the hospital.

I understand that my replies to all questions and chart information are strictly confidential and kept in a locked box in the office of the researcher. I also understand that I will be identified by a code number only and will not be identified in any publication. I am aware that I may refuse to answer any questions, or withdraw from the study, at any time for any reason. Should I choose to withdraw, it will in no way affect the care I receive from my doctors, nurses or other health care members.

I further understand that I may not personally benefit from participating in the study. The information obtained may help others who require CABG surgery in the future. I understand that if I have any questions I can contact C. Davis, (St. Michael's Hospital, 416-864-6030).

I agree to participate in this study.

Date: ____________________
Signature of Patient: _______________ Signature of Witness: _______________