THE RELATIONSHIP BETWEEN PATIENT SATISFACTION AND SELECTED VARIABLES IN AMBULATORY SURGICAL PATIENTS

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Date

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entitled The Relationship Between Patient Satisfaction and Selected Variables in Ambulatory Surgical Patients.

I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

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DEDICATION

This dissertation is dedicated to my husband Richard for his continued love, support and guidance during the dissertation process. Thank you for your patience in allowing me time to think. To my daughters Kimberly, Rebecca and Sharleen for sharing me with my career goals.

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ABSTRACT

THE RELATIONSHIP BETWEEN PATIENT SATISFACTION AND SELECTED VARIABLES IN AMBULATORY SURGICAL PATIENTS

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The purpose of this study was to examine the relationship of selected variables (i.e., collection of patient information by the nurse via computer; the patient's preoperative reported anxiety; postoperative pain; satisfaction with pain management; patient satisfaction following pre-admission; age; number of previous hospitalizations; and patient computer use) with patient satisfaction. This study attempted to determine whether (a) the ambulatory surgical patient's reported anxiety changes between the preoperative and postoperative period; (b) there is a difference between the reported anxiety scores of patients treated in computerized or non-computerized hospital settings; and (c) patients with less pain at the time of discharge have higher ratings of satisfaction with their pain management.

A descriptive correlational study was conducted in two hospital settings with 130 ambulatory surgical patients. The study hospitals differed in that one was computerized (i.e., the nurse used a computer when collecting and recording patient information) and one was not. Data were collected at pre-admission and postoperatively using the State-Trait Anxiety Inventory (Spielberger, 1982), Patient Data Form, Pain Questionnaire and Patient Satisfaction Instrument (PSI) (Risser, 1975). The PSI was modified for this study. The nurses (N=16) in the outpatient surgery departments completed the Nurse Demographic Data Form.

The patient sample (N=130) differed in age and computer use between the two hospitals.

The nurse sample differed in the number with computers in their home and satisfaction with nursing. A Spearman rank-order correlation indicated that those patients who reported higher postoperative pain also indicated higher patient satisfaction (r_s = .22, p = .01). A point biserial correlation indicated a significant correlation between patient satisfaction and the computerized hospital (r_{pb} = .22, p = .01). The sample in the computerized setting showed a higher mean patient satisfaction. Reported patient anxiety was not significantly different from pre-admission to postoperative period or between the study hospital samples. A Spearman rank-order correlation test suggested that, if patients have more postoperative pain, they will rate their satisfaction with pain management lower (r_s = -.49, $p \leq .00$).

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CHAPTER I

INTRODUCTION

Patient satisfaction has been identified as an important outcome indicator of health care in the hospital, a setting in which the nurse plays an important role. In the hospital the nurse is held responsible for direct patient care as well as activities related to the organization and structure of care such as documentation, staffing for patient care, preparation of patient care protocols, and coordination of nursing services with other hospital departments. In previous studies, patient satisfaction has been linked to a variety of factors such as the hospital setting (Lynn & Sidani, 1995; Walker, Brooksby, McInerny, & Taylor, 1998), anxiety (La Monica, Oberst, Madea, & Wolf, 1986; Risser, 1975), and pain and its management (Jamison et al., 1997). Patient demographic variables such as age and number of previous hospitalization have also been related to satisfaction with the health care experience (Abramowitz, 1987; Mancuso, 1993).

One of the variables that is increasingly becoming a part of the hospital setting is the use of the computer by nurses for collecting information directly from the patient. The ambulatory surgical admission may be a situation in which a nurse uses a computer while taking the patient's history and recording the information. Following the surgical procedure, the nurse may again use the computer while interacting with the patient. Whether or not the introduction of the computer into the nurse-patient interaction interferes with communication and, thus, influences satisfaction is not clear. Nursing philosophers describe the situation of the nurse using a computer as one that alienates the nurse from the patient in the scientific paradigm (Gadow, 1984; Sandelowski, 1988). Anderson's (1996) finding that the patient who uses a computer shows greater comfort with computer use suggests that the patient's familiarity with the computer may be a factor related to its acceptance in the patient care situation.

Problem of Study

Preoperative and postoperative care in the United States (U.S.) is changing as technology is changing, resulting in shorter hospital stays and an increasing number of ambulatory (one-day) surgical admissions to the hospital (Williams, 1997). At the same time, nurses and other health care professionals are focusing on what outcomes can be measured to determine the quality of care that is provided. One of the outcomes that has been associated with quality is patient satisfaction (Greeneich, 1993). The major question addressed by this study was whether the following selected variables are associated with the satisfaction of patients admitted to the hospital for ambulatory surgery: collection of patient information by the nurse via computer, the patient's preoperative reported anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following the pre-admission process, and demographic variables (age, number of previous hospitalizations, and computer use). No studies have been reported that explore the relationship between computer use in direct patient care situations and patient satisfaction. Likewise, while anxiety and pain have often been associated with an individual's surgical experience, little is known about their role in relation to the patient's satisfaction with the ambulatory surgical experience.

Purpose of the Study

The specific study aims related to the exploration of the variables associated with patient satisfaction were to (a) examine the relationships between the selected study variables and patient satisfaction, (b) determine whether the ambulatory surgical patient's reported anxiety changes between the preoperative and postoperative period, (c) determine whether there is a difference between the reported anxiety scores of patients treated in the computerized or non-computerized hospital settings, and (d) determine whether patients with less pain at the time of discharge will have higher ratings of satisfaction with their pain management. These aims were

addressed through a descriptive correlation study conducted in two hospital settings with ambulatory surgical patients. While the two hospital settings used were selected based on their similarities, a major selection criterion distinguishing the two was that one hospital was computerized (i.e., the nurse used a computer when collecting and recording patient information) while the other one was not computerized.

Rationale

The variables associated with patient satisfaction change over time and are related to patient expectations and experience. Assessing patient satisfaction with health care is ethically and pragmatically meaningful since it is an important indicator of quality care (Donabedian, 1988). Patient satisfaction exhibits the incorporation of health maintenance behaviors and indicates future health care behavior (Donabedian, 1988). A component of satisfaction with health care is related to personal, individual attention given by the nurse to the patient (Greeneich, 1993; Lynn & Sidani, 1995).

One of the most profound changes in the nurses' work environment during the 1990s was computerization of the documentation process, data collection, and hospital operations. The presence of a computer within the nurse-patient relationship has not been studied in the context of patient satisfaction. Patients who do not have point of care technology (i.e., computers at the bedside) were found to be more satisfied than patients in rooms with point of care technology (Happ, 1993). Nursing care provided through a complicated network of machinery is felt to be more alien to human dignity than care provided through non-mechanical means (Gadow, 1984). Patient concerns with the physical setting of the hospital are documented (Lynn & Sidani, 1995; Walker et al., 1998) but additional effects of a computerized hospital environment on patient satisfaction are not known.

Anxiety in anticipation of a hospital procedure is at least partially related to patient

expectations concerning nursing care. The patient with higher expectations is less likely to be satisfied during a hospitalization (Abramowitz, Cote, & Berry, 1987). Anxiety can be detrimental to physical and emotional recovery, prolong hospitalization, and contribute to poor treatment outcomes (Blair & Ramones, 1996). Studying the association of anxiety with patient satisfaction may confirm its theorized connection with patient expectations.

Pain management in the hospital represents a nursing-sensitive outcome (American Nurses Association [ANA], 1995) Study results indicate a deficit in nursing awareness and treatment of pain (McCaffery & Hart, 1976; Watt-Watson, 1987). Lack of nursing attention and management of pain have been identified as important predictors of patient satisfaction (Koh & Thomas, 1994; Tousignant, 1999). The inclusion of pain intensity and management in this study should aid the understanding of their association with satisfaction. By studying the associated variables of the hospitalized patient's satisfaction following an ambulatory surgical procedure, it is hoped that this study will contribute to a continued effort to improve quality, nursing care.

The patient data on age, number of hospitalizations and computer use was collected in order to explore their associated role with satisfaction. The number of previous hospitalizations might be expected to influence patient expectations. The patient who has had previous experiences with hospital routines and the ways in which nurses provide care will probably be less anxious and thus, better able to anticipate health care events. The unexpected sight of the nurse carrying or appearing on the other side of a computer may add certain stresses and strains to the nurse-patient relationship. Age and computer use may play a part in the patient's comfort with a nurse using a computer at the bedside. Younger patients are more likely to have used a computer themselves and know its function and value in the situation. Higher computer anxiety is associated with less experience with computers (Anderson, 1996).

Several factors led to the selection of the ambulatory surgical patient for this study.

Importantly, this patient's experience will be representative of that of many patients who are now in the hospital for only a short time period. As with other situations (e.g., diagnostic procedures), there may be a two-step process that involves a pre-admission experience that represents the patient's initial introduction to the hospital. As for most individuals faced with an unknown experience, anxiety is likely to be a factor. The nurse assesses the patient's emotional state and anxiety level, provides information and support that allows the patient to gain an understanding of the upcoming experience, and affords an opportunity for developing trust in the health care team (Williams, 1997). The findings of this study are expected to contribute to the knowledge that is necessary for continued improvement of factors that may lead to increased in-hospital patient satisfaction. The nurse's understanding of these factors could contribute to actions that increase both the satisfaction with and quality of care. As noted by Williams (1997), a nurse who is knowledgeable, respectful, and exhibits a caring attitude provides emotional support to the patient and the family, thus molding the patient's attitude about the procedure, the staff, and the facility (Williams, 1997).

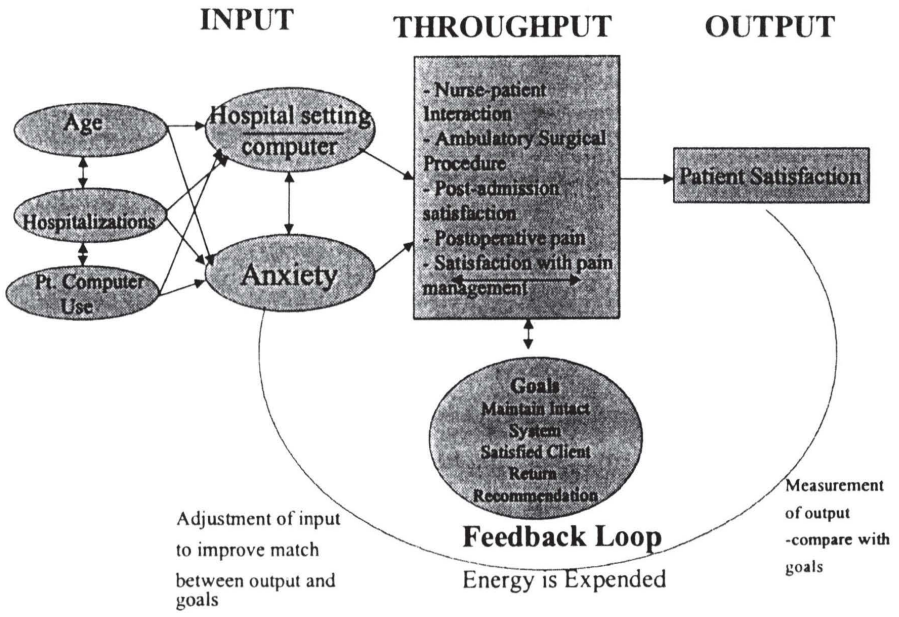
While it has been acknowledged that patient satisfaction is known to correlate with a number of variables (LaRochelle & Pesto, 1989). This study is expected to supply further insight into the associated variables. The results should also furnish increased knowledge of the relationship between computerization and the in-hospital patient's satisfaction. Such information could be helpful at a time when computer use in the patient care situation is increasing. Insights gained should assist nurses in taking a leading role in the choice of computer hardware and software that enhance nurse-patient interaction.

Theoretical Framework

The theoretical framework for this study is provided by the general systems theory originally proposed by von Bertalanffy (1966). This framework guides the study by viewing the

study variables within the general systems theoretical structure. Figure 1 illustrates the integration of the study variables into this framework.

The essence of systems theory is that any action, whether social or biological, causes a reaction within its own environment. The action also changes the relationship of that object to all the other objects in its environment. All systems have inputs, throughputs, outputs and a feedback loop (Mason & Attree, 1997).



(adapted from Mason & Attree, 1997)

Figure 1. A systems model of ambulatory surgical patient satisfaction

The hospital environment is viewed as a system that incorporates the patient within it, thus the interaction between the patient and the hospital environment represent the system studied. Patient demographic variables of interest are age, number of previous hospital admissions, and patient computer use. Patients enter into an exchange with the hospital

environment, and this interaction stimulates intrinsic activity within the overall system. The ambulatory surgery patient brings a multiplicity of variables into a setting already comprised of many variables. A steady state is maintained with a continuous inflow and outflow of energy. The patient's state is maintained or improved by a cyclical pattern of activity involving a process of input, throughput and output. Interaction between parts of the system necessitate expenditures of energy. Existence of a system is dependent upon replacement of this lost energy (von Bertalanffy, 1966).

Patients, existing in a dynamic state along the wellness-illness continuum may experience problems of maintaining equilibrium of forces within the hospital environment. The emotional stress of physical illness can result in increased stress on an already impaired physiological subsystem. This stress may be exemplified as increased anxiety in the ambulatory surgery patient. A person with any type of illness, chronic or acute, is affected by many factors, including the perceived meaning of the illness, its physical and emotional effects, the quality of medical care available, the quality of nursing care available, and how family and friends react to the illness.

Patients have a personal understanding or preconceived idea of the function of the nurse and the hospital system. The patient's level of anxiety at the time of pre-admission is an input to the system, as is the nurse's use of computers in the direct patient care situation. The unpredictability of the nurse carrying or appearing on the other side of a computer may place certain stresses and strains on the nurse-patient relationship. The number of previous hospital admissions is viewed as an important variable in the patient's formation of personal understanding of the system (Hanson, 1995). Age is projected as another input variable (Mancuso, 1993).

Throughputs of the system are post-admission satisfaction, the ambulatory surgery with its associated variables of postoperative pain, and satisfaction with pain management. The

emphasis of nursing then becomes one of matching its energies to the stressors. Social interaction or communication is a system through which human beings establish a predictable continuity of life. As such, communication with other organisms is virtually essential for the continuance of human life. Patients come to the hospital with psychosocial and culture subsystems in place. Communication takes place between the patient and the nurse. Since a degree of predictability is a quality upon which equilibrium is based, one system learns to predict what another is likely to do. If this predictability is not correct, certain stresses and strains develop in the interrelationships of the various systems. By understanding better the hierarchy and predictability of mankind's many interwoven systems, better control and correction of the systems can be developed (Putt, 1978).

The system output of interest in this study is patient satisfaction. All ambulatory surgery patients will respond to the environment and their own illnesses in a unique manner with a different level of outcome. The nurses and other health care professionals participating in the interaction through the hospital system, or throughput, are interested in producing optimum, positive, patient outcomes.

The feedback loop involves the energy expended to maintain the patient in a steady state. The person who is ill must expend energy, not only to attain optimum wellness, but also to deal with the variables (e.g., anxiety, pain, and interactions) experienced in the hospital environment. Feedback is the homeostatic maintenance of a steady state. Feedback circuits function to control variables, modify reaction by facilitation, inhibition, or dissemination and direct the overall system toward a goal. The primary goal is the maintenance of an intact system. The nurse and other hospital personnel are expending energy to maintain a steady state in themselves, the hospital, and the patient (Mason & Attree, 1997).

Assumptions

1. Ambulatory surgery patients experience preoperative anxiety.
2. The nurse's use of the computer in direct patient care situations can interfere with the nurse-patient interaction.
3. Experienced anxiety can be measured as reported by the individual.
4. A variety of individual patient variables and variables that are part of the hospitalization (i.e., throughput variables) contribute to the patient's satisfaction.
5. Nursing care is a meaningful element in patient satisfaction.

Hypotheses

1. Patient satisfaction is significantly associated with the following variables: collection of patient information by the nurse via computer, the patient's reported preoperative anxiety, postoperative pain, satisfaction with pain management, patient satisfaction immediately following pre-admission and demographic variables (i.e., age, number of previous hospitalizations, and computer use).
2. The median anxiety scores reported by the ambulatory surgery patients will increase from the preoperative period to the postoperative period.
3. Patient's median pre-admission and postoperative reported anxiety scores will be higher in Hospital A (computerized) than Hospital B (non-computerized).
4. Patients with less perceived pain at the time of discharge will demonstrate higher ratings of satisfaction with pain management.

Definitions of Terms

Computer is a menu-driven data capture and entry device with the ability to store patient

information. This information includes multi-disciplinary notes and diagnostic data. The computer may be handheld, trolley mounted or a permanent fixture of the admission room.

State anxiety a temporary emotional state characterized by subjective, consciously perceived feelings of tension, apprehension, and nervousness accompanied by or associated with activation of the autonomic nervous system. State anxiety was measured by the State Trait Anxiety Inventory Form Y-1 developed by Spielberger (1983). A higher score indicates a higher level of reported anxiety.

Postoperative pain is the pain experienced in the time period between ambulatory surgery and discharge from the hospital. It is acute pain caused by the disruption of integrity of the body due to manipulation or incision. It was measured in this study by the pain questionnaire; the higher the rating, the greater the reported pain intensity.

Pain management satisfaction represents the patient's perceived level of satisfaction with nursing measures performed for the purpose of providing pain relief for the patient. It was measured by a researcher-developed rating on the pain questionnaire. A higher score indicates greater pain management satisfaction.

Ambulatory Surgery is a procedure, which takes place in an outpatient surgical department. The patient visits the outpatient surgical department from 1 to 30 days prior to surgery for history taking and preoperative teaching. On the day of surgery the patient is assessed by a registered nurse prior to surgery. The patient has minimally invasive surgery and stays in the unit an average of 8-12 hours. A short recovery phase followed by discharge teaching takes place prior to the patient's hospital discharge.

Outpatient Surgery Department is an area in the hospital containing the pre-admission office, single day surgery assessment area and recovery rooms. On the day of surgery, the patient is in the Department less than 24 hours.

Patient in this study is an alert, oriented individual over 18 years of age. The patient will stay in the outpatient surgical unit for less than 24 hours and have minimally invasive surgery.

Limitations

The limitations of this study include the following:

1. Two different settings are used for this study. One is a computerized setting (i.e., a hospital setting in which the nurses collect data at the bedside with a handheld computer and document pre-admission data directly by keyboard). The other is a setting using pen-and-paper for recording patient data during the pre-admission procedure, ambulatory surgery assessments and postoperative recovery. Although these hospitals are in the same county and owned by the same hospital system, the nurses, administrators, and other environmental factors are different.
2. The study is limited to ambulatory surgery patients being admitted to two 250-bed private hospitals. Generalization of findings will be limited to the ambulatory surgery population in these settings.
3. The use of computers in the direct patient care situation is a variable of difference in the two hospitals used, but it is only one of many potential indicators of patient satisfaction. The sample in the study is a convenience sample. Ambulatory surgery patients are entering the hospital with a variety of diagnoses to undergo a variety of procedures. Although all procedures are minimally invasive, the surgical outcome is not controlled. Admission diagnosis is collected for sample description and comparison.
4. The time lapse between the pre-admission assessment and hospital admission for the surgical procedure vary. Any effects of the pre-admission procedure on ratings of patient satisfaction during hospitalization, therefore, might vary widely.
5. The time patients spend in the hospital between the operation and discharge vary.
6. Insurance information is collected in both study hospitals by clerical personnel using

computers. Patients may not distinguish the clerical personnel from the nursing staff.

Delimitations

This study is taking place in the outpatient surgical departments of two selected hospitals due to their similarities (e.g., size, location, ownership) and the distinguishing difference of nurses' computer use for collecting and recording patient information.

Summary

Patient Satisfaction has been identified as an important outcome indicator of the health care provided in the hospital setting. Of great importance to the hospital are the patients' intent to return when future hospitalization is needed and their recommendations concerning the hospital to others. A satisfied patient will be more likely to incorporate health maintenance behaviors improving their long-term state of wellness (Greeneich, 1993). Nursing care is an essential element in patient satisfaction.

The main purpose of the study was to explore the association of the following variables with the satisfaction of patients admitted to the hospital for ambulatory surgery: collection of patient information by the nurse via computer, the patient's preoperative reported anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following pre-admission and selected demographic variables (age, number of prior hospitalizations, and computer use).

Ambulatory surgical patients were sampled in this study, since they represent a growing proportion of the patients admitted to the hospital. Two hospital settings were used, one well established with the use of the computer by the nurse in the collection and documentation of patient information and the other using pen-and-paper for this purpose.

The general systems theory provided the framework for guiding this study. Theoretical

and operational definitions of terms consistent with this framework are used. The organizing framework assisted in viewing the integration of the patient into the hospital environment and the interactions that might lead to an outcome such as patient satisfaction. This framework also provided support for the four study hypotheses. These hypotheses also reflect the major questions guiding the study's purpose. The study's underlying assumptions and limitations were noted, for these will be important to any interpretations made of the study's findings.

CHAPTER II

REVIEW OF LITERATURE

The literature review is organized around patient satisfaction and related topics that reflect the variables of interest in this study: (a) computerized patient care environment, (b) anxiety, (c) pain, and (d) selected demographic variables. These selected demographic variables are age, number of prior hospitalizations, and computer use. The review begins with patient satisfaction; the effect and interaction of associated variables of patient satisfaction, as found in the literature, are examined. Current research indicates a connection between these selected variables and patient satisfaction.

Patient Satisfaction

Consumers are demanding accountability from all health care providers, including nurses. Patient satisfaction, an important indicator of quality care, is a judgment on aspects of quality care made by the patient. Continuous quality improvement (CQI) emphasizes systems and performance improvement, and its goal is to meet the needs of the consumer (Davis & Bush, 1995). It is apparent from the current emphasis on total quality management and CQI in health care that evaluation of quality care is based in a large part on the patient's expectations and experiences. Compliance with health care recommendations is another reason patient satisfaction is important. If compliance is to be achieved, information from patients is indispensable. Assessing patient satisfaction with health care is ethically and pragmatically important. Additionally, satisfaction is one of the antecedents to an individual's future health care behavior (Donabedian, 1988).

A telephone survey involving 841 discharged patients the New York Hospital was the design of a frequently cited research study (Abramowitz, Cote, & Berry, 1987). The patients were

randomly chosen from four major services including surgery, obstetrics/gynecology, general medicine and pediatrics. Ten sets of services were rated on a four-point scale for satisfaction. Two types of analysis were undertaken: correlation/factor analysis and causal modeling. Results showed that patient satisfaction was strongly correlated with giving attention to patients' concerns. Patient expectations about the quality of their care were highly related to their expectations about the kind of service they received and with the staff making their treatment as pleasant as possible. Expectations regarding the amenities of a hospital were found to be distinct from those regarding the medical care and other services rendered. Only nursing service was directly related to overall satisfaction with a hospital stay. Expectations for hospital care also figured strongly in overall satisfaction. The nursing staff is key to patient satisfaction. Nurses are the hospital's goodwill ambassadors and frontline representatives (Abramowitz, Cote, & Berry, 1987).

The importance of nursing care was investigated in a study that took place at Presbyterian Hospital of Dallas. Over 200 patients participated in a study of nursing care and patient satisfaction. Patients were surveyed using a 56-item Likert scale questionnaire. Results showed that nursing care was the primary determinant of overall patient satisfaction. The aspects of nursing most important to outpatients were nurses introducing themselves, overall nursing care and technical skills. Kindness, support and patience were also items of importance (Evans, Martin, & Winslow, 1998).

The areas of emotional support or physical care were those most likely to be reported as a failure in another study that included 2000 adult medical/surgical patients. In an assisted telephone interview system the patients were contacted within 26 days of discharge from hospital. A report approach survey included items, identified as important by patients and experts, about timeliness, thoroughness and individualization of certain aspects of service. The six hospital services of physical care, pain management, participation in decision making, participation in

care, emotional support and education were reported. Any adult, non-psychiatric, non-obstetric patient capable of giving informed consent and being discharged was eligible. The distribution of patients' ratings of their hospital care was, excellent 49%, very good 32%, good 14%, fair 4% and poor 1%. Results indicate that an unfavorable service score on instruction about post-discharge signs and symptoms is most likely to result in poorer overall ratings of the hospital and an unwillingness to recommend the hospital. Approximately 7% of patients were unwilling to recommend the hospital to others. Many patients reported that individualization, timeliness, and thoroughness of service were less than adequate. The findings lend support to the affirmation that patients require assistance in identifying learning needs (Minnick, Young, & Roberts, 1995).

Patient satisfaction is defined as a judgment made by the patient concerning the perceived quality of health care. Donabedian divided quality of care into two domains of technical care and interpersonal care. This conceptual framework is incorporated into a number of studies focusing upon patient satisfaction with nursing care. Technical performance depends on arriving at appropriate strategies of care, and skill in implementing those strategies. Technical quality is judged by the degree to which achievable improvements in health can be attained. The interpersonal process is the vehicle by which technical care is implemented and on which its success depends. The conduct of the interpersonal process must meet individual and social expectations and standards. The interpersonal process is tailored to the achievement of success in technical care (Donabedian, 1988).

In the health care marketplace, satisfaction with health care is a crucial patient outcome associated with new and return business. The patient has become the consumer of health care. Nursing, patient and organizational tracts are used to classify phenomena in the model (Greeneich, 1993). Greeneich agrees with Abramowitz (1987) that nursing is a key determinant of overall patient satisfaction with hospitalization. Inherent personality characteristics, nursing care characteristics, and nursing proficiency are aspects of the nursing tract. These aspects roughly

parallel the domains of technical care and interpersonal care as theorized by Donabedian (1988). The patient tract involves the element of patient expectations. The match between patient expectations of nursing care and the care actually received is expressed as patient satisfaction. Patient satisfaction as an outcome of health care delivery has been widely adopted as an indicator of quality of care. The environmental tract contains two different domains, the physical environment and the organizational environment. Implications for nursing, from the theoretical model of patient satisfaction, entail meeting expectations (Greeneich, 1993).

Interpersonal care is a construct that has been isolated in a qualitative study. Being "with" the patient and family is an important part of interpersonal nursing care. A critical aspect of interpersonal contact is time. Being patient, instructive, facilitative and communicative to the patient and family are important elements of good care. Interpersonal care includes understanding the humanness and the value of every patient and family member and treating them with respect. A "bad nurse" is a nurse who was interpersonally incompetent. The criteria by which patients judge nursing care are process criteria: those aspects of nursing care that most directly affect the patient. Nurses must focus on these process criteria if they are to deliver the kind of care patients expect (Lynn & Sidani, 1995).

The shift of health care to a business framework provides the viewpoint of nursing as a service provided for a customer. Product quality can be equated with technical quality in health care. Research on business success reveals identifiable reasons for customers switching to a competitor. Fifteen percent switched because they found a better product from another company. Another 15% switched because they found a cheaper product. Twenty percent, however, switched because of lack of personal attention, and another 45% switched because service was rude and unhelpful. Employee behavior toward customers is an organization's most powerful marketing and customer satisfaction tool. Meeting and exceeding customer expectations is a top agenda. Satisfaction in the business world is a positive evaluation of specific service dimensions

based on patient expectations and provider performance. Providers of patient care services must recognize that the patient has real expectations (Greeneich, 1993).

The business model was used to study a restructured health care delivery system by the University Medical Center at the University of Arizona Health Sciences Center, Tucson, when it implemented a plan which consisted of adding patient support attendants and patient care technicians to care delivery. Inpatients were surveyed nine months before restructuring, four months after restructuring and 10 months after restructuring. A telephone survey was administered one to seven days after discharge. Domains assessed included cleanliness of facilities, food service, nursing care, medical care and ancillary services. A 4-point Likert type response scale ranging from excellent to poor was used in the study. Nursing care items addressed were availability of nurses, effort to make the patient feel comfortable, attention to worries and concerns and explanation of care after discharge. Three hundred and fifty-eight patients were surveyed before and after restructuring. One objective of restructuring was to provide quality service to the clientele. Results indicated that to the patient, quality care is service in a timely fashion. The patient is more comfortable with a nurse who is present and becomes familiar with the patient's care. Most patients are generally satisfied with their service experience. The restructuring did not make a difference in patient satisfaction (Brice, 1994).

Patient satisfaction in the emergency department (ED) is a concern of nurses. Patient satisfaction levels may predict where the patient will go for treatment with a choice of freestanding urgent care clinics, doctors' offices or the ED. In a descriptive correlational study, 28 urgent and non-urgent subjects completed and mailed back an ED patient satisfaction survey and demographic form. The areas of measurement regarding patient satisfaction were nursing care, environment, ancillary services, and information received. Highest satisfaction scores were indicated for overall caring and compassion (75%), skill with medications and treatment (74%), and explanation given about care (71%). Specific areas of nursing care noted to have lower

satisfaction ratings included the concern the nurses had for those accompanying the patient (19%), explanation that the nurse gave to patients about the care they were receiving (11%), and the watchfulness of the nurse about the patient's condition (11%). The patients who participated in the research were generally satisfied. Implications of this study are that patient satisfaction levels in the ED may be increased by focusing on the interaction between the ED nurse and the patient as well as the technical skills required of the ED nurse (Bruce, Bowman, & Brown, 1998).

The aim of a study from the United Kingdom concerning consumer satisfaction, was to understand how people evaluate and make sense of their experience of hospital care. A qualitative approach was used conducting narrative interviews, four to six weeks after inpatient care or day surgery. Eighteen adults, 25 to 86 years old, were interviewed in their homes for one to three hours. Standards of treatment and care are determined and practice was measured against them by clinical audit, patient satisfaction surveys and monitoring of patient complaints. A constant comparison analysis identified those categories of personal experience from transcribed tapes: feeling adequately informed, feeling valued as an individual, and feeling at home. One of the hospital's wards had recently introduced a new computer system and this led a patient to comment that she felt isolated and anxious because the nurses were paying more attention to their computers than to the patients (Walker, Brooksby, McInerny, & Taylor, 1998).

In-depth interviews were also used in a study of cardiac patients to clarify and measure expectations and evaluation of care. Day case and in-patients were sampled using a purposive technique to maximize variability. Interviews took place at two points: just before admission to hospital and just before the patient went home. Patients were 16 years and older varying in sex, age, social class, ethnic group and level of education. Cardiac patients were found to have specific expectations of their care, most of which were expressed with clarity. There were four main groupings of expectations identified in the study: expectations of the nurse, the doctor, the patient's own participation in care and the outcomes of the health care episode. The expectation

that patients had of nurses was that of providing information about progress and giving advice, explanations and guidance. The nurse should provide proper care and be there when needed, the patient expected to feel comfortable with the nurse. During the second interview patients were asked to describe their care by comparing what had happened in relation to their initial expectations. Patients were readily able to distinguish between ideal and realistic expectations of care. Normative expectations included the notion of what is deserved in the health care situation. Patients also had unformed or partly formed expectations that occurred when no prior experience of a particular situation was present. Patients placed value on the expectations of outcomes as the underlying reason or goals of seeking care. They tended to evaluate their care based on some comparison with a previous expectation. Expectations varied in the factors which influenced them, their type, whether they were positive or negative, their changeability and whether patients attached a value to them. The study findings emphasized the need for satisfaction studies of an exploratory nature (Staniszewska & Ahmed, 1999).

Patient satisfaction is used extensively to study changes in staffing patterns and facilities. Patient satisfaction was measured in a quasi-experimental longitudinal/repeated-measures study designed to assess hospital-restructuring efforts. Restructuring consisted of major facility changes, enhanced telecommunication and information systems, and redesigned staff roles encompassing multi-skilled personnel. Seven dimensions of nursing care components were researched, these included nurses' friendliness, nurses' promptness, nurses taking problems seriously, nurses' attention to special needs, nurses providing information regarding tests, technical skill of the nurses and nurses' consideration of the individual. Two dimensions, nurses' promptness and nurses' consideration, were significantly improved. Significant and substantial improvements were found for three of the four studied units within the facility (Bryan et al., 1998).

When a nurse researcher asked 22 oncology patients what characteristics make a good nurse, they offered eight qualities: attentiveness, care coordination, caring, continuity,

individualized care, partnership, professional knowledge and rapport. The patients stressed the importance of a good interpersonal relationship with their nurse. Participants described their desire for the nurse to establish rapport with them and to individualize their care. Patients appreciated it when nurses had experiences that could be related to them (Schreiber, 1999).

Attempts have been made in current nursing research to isolate the elements of nursing care, which promote patient satisfaction. Nursing studies of patient satisfaction began with the work of developing an instrument to measure patient satisfaction. Building on the work of Donebedian (1968), Risser (1975) developed the Patient Satisfaction Scale (PSS). Risser advocated evaluation of health care services from the patient's perspective. Literature review in this developmental study isolated information concerning patient satisfaction, noting that it implies an attitude. Patient satisfaction with nursing care can be conceptualized as the degree of congruency between a patient's expectations of ideal nursing care and the perception of the real nursing care he receives. Components of nursing care include (a) technical-professional behavior of the nurse; (b) interpersonal-educational, or the social aspects of nursing care and information exchange; and (c) interpersonal-trusting relationship. Building on this conceptual base, development and selection of PSS items was done using patient interviews and content analysis by nurses. Using the PSS, nurses and nursing care were evaluated in the ambulatory primary health care setting (Risser, 1975).

Three studies were done to further develop and test the PSS. Seventy-five adult hospitalized patients were sampled in the initial study. Items from the Risser scale were revised as needed to reflect nursing behaviors expected in the acute care setting and additional items were generated to make a 50-item instrument. Forty-two of the items met the cutting criteria and were retained. Several were reworded, and a study was done to estimate internal consistency. The original 5-point Likert scale was changed to a 7-point scale. One hundred hospitalized cancer patients were sampled in the second study. Results showed the scores on all items to be skewed

positively and the sub-scales measured overlapping domains. In a third experimental study, the effects of an Empathy Training Program were measured. The psychometric properties of the instrument, now called the La Monica-Oberst Patient Satisfaction Scale (LOPSS), were further assessed. A total of 664 hospitalized cancer patients were sampled in the pretest-posttest study. Construct and discriminate validity of the tool were measured using Pearson product-moment correlations. It was theorized that patient satisfaction might correlate negatively with anxiety, depression and hostility. Factor analysis procedures were used to examine the underlying structure of the tool. Results again were skewed toward the positive end of the scale. Correlations offered moderate support for the discriminant validity of the LOPSS. Three factors were isolated and labeled dissatisfaction, interpersonal support and good impression. It is possible that satisfaction and dissatisfaction are not opposite ends of the same continuum, but are separate continua (La Monica, Oberst, Madea, & Wolf, 1986).

The La Monica scale was used in a study to develop and validate a measure of patient satisfaction with a district nursing service in the UK. The subjects were 126 housebound elderly people living alone and dependent upon nursing services. A structured interview was conducted. Four standard questionnaires (i.e., a Mini Mental State Exam, Life Satisfaction Index, depression inventory and the La Monica scale) were administered at two different times. The study addressed the question of how significant is the nurse-patient relationship in determining satisfaction with community nursing care. Seven factors emerged as meaningful dimensions of satisfaction: the professionalism of the nurses, their effectiveness as communicators, their reliability, their care and concern, their capacity for empathy and their neglectful or uncaring attitude. In the interview situation patients making spontaneous comments about their relationship with their nurse are more likely to express satisfaction than those not commenting. Those who had commented on restrictions show a lowered level of satisfaction. Personal knowledge was significantly associated with the feeling that nurses cared and were concerned for them. The

more personal domains of satisfaction are significantly associated with amounts of personal knowledge, while the more professional, task oriented satisfaction sub-scales showed no significant association. The La Monica scale proved to be sensitive to a real change in the level of services that occurred during the course of the study (Gilleard & Reed, 1998).

Comparison of the performance of the LOPSS and the Risser Patient Satisfaction Scale indicated that both tools have almost identical score ranges, location of mean, skewness and variability. The reliability coefficients of the new sub-scales identified by factor analysis were higher than those of the original sub-scales. It was judged that stability of expectations, the standard against which care is measured is unlikely to occur (La Monica et al., 1986).

The Patient Satisfaction Instrument (PSI) was developed over a series of five clinical and administrative studies. The PSI is a 5-point Likert scale adapted for inpatient use from Risser's PSS. Patient satisfaction, the patient's opinion of the care received from nursing staff, was conceptualized as an outcome evaluation criterion. The PSI was administered to a sample of 600 patients. Additionally, Risser's study data on two sequential trials of 78 and 52 outpatients were used. Data from a consumer satisfaction study at Arizona Health Sciences Center of 57 in-hospital medical-surgical patients was analyzed. The final study was a documentation of preoperative teaching effects in the operating room. Successive psychometric estimates made across five studies suggested acceptable levels of both validity and reliability of the PSI (Hinshaw & Atwood, 1982)

The Arizona Health Sciences study measured the effect of changing to an all- RN nursing pattern on patient satisfaction. The study measured the effect of implementing a set of care-comfort nursing standards. Homogeneous patient populations responded to the PSI in a manner indicating that satisfaction was a unidimensional concept. Heterogeneous samples, in reference to medical conditions, consistently validated the existence of the predicted three domains of satisfaction proposed by Risser in 1975 (Hinshaw & Atwood, 1982).

Another study measured patient satisfaction to determine the effect of routine hospital discharge or earlier hospital discharge with coordinated nurse specialist transitional follow-up care. Another purpose of the study was to provide further psychometric testing of the La Monica-Oberst Patient Satisfaction Scale (LOPSS) with different patient populations. The study group included women diagnosed with cesarean birth, diabetes, and hysterectomy; the 41-item LOPSS scale was used. Results showed a skewed distribution indicating satisfaction with care for all subjects. Considerable overlap between the factors of interpersonal support and good impression was found. The original scale was revised to 28 items and, when analyzed, these items provided a high estimate of reliability.(Munro, Jacobsen, & Brooten, 1994).

Patient satisfaction as conceptualized by Risser (1975) was used to compare couplet care nursing versus traditional postpartum care with rooming-in. A descriptive comparative research design was used to sample 400 women. A modification of the Risser PSS was used to measure patient satisfaction. The instrument was modified to fit the nursing assignment and practices of the postpartum unit. The results showed that women in both the traditional nursing care group and the couplet care group were satisfied with the nursing care. In discussing the lack of difference between the groups, it was considered by nurses that a higher quality of care may not have an effect on patient satisfaction. Patients value social courtesy and promptness of care in having their needs met. Thus, the patients given couplet care may have received a better quality of care without realizing it (Cottrell & Grubbs, 1994). There is a question as to whether patients really have the technical knowledge to evaluate the quality of care they receive (LaRochelle & Pesto, 1989).

In another study of patient satisfaction as conceptualized by Risser (1975), the professional practice model, in which unlicensed personnel were trained to assist registered nurses in patient care, was compared to a traditional all-RN staffed critical care unit. The program operated over an 18-month period. Quantitative methods were used to study a convenience

sample of 27 critically ill patients and family members. No changes were evident in any of the sub-scales of the Quality of Nursing Care instrument. This suggested that satisfaction with quality of care did not change when critical care aides were added to the work force. As the major analysis of this study concerned nurse satisfaction, no discussion was made of the Quality of Nursing Care instrument and the reason for no change in patient satisfaction (Cone, McGovern, Barnard, & Riegel, 1995).

In a study investigating the relationship of satisfaction to dissatisfaction with nursing care among homogeneous patients and heterogeneous patients, a revised Risser PSS with 54 items was distributed to a convenience sample of 544 patients on dismissal from hospital (Mancuso, 1993). The proposition that satisfaction and dissatisfaction are orthogonal concepts was supported by findings obtained from principle component analyses and confirmatory factor analyses. The orthogonal relationship of patient satisfaction to dissatisfaction is consistent with the theoretical relationships proposed by Herzberg (1959) to describe job satisfaction. Confirmatory factor analyses did not support inclusion of the education subscale as a conceptual component of satisfaction or dissatisfaction. The medical-surgical patient may not consider education as part of patient satisfaction. Education is not always perceived by patients as being part of satisfaction and dissatisfaction with nursing care. This conceptual division is consistent with the findings of LaMonica et al. (1986). If the patient does not perceive a need to learn or learns because of a frightening situation, educational activities of the nurse are not incorporated within the concepts of satisfaction or dissatisfaction. The educational activities of the nurse may only be incorporated within perception of patient satisfaction if the patient expects the nurse to teach, and if the content that the nurse teaches is what the patient wants to know. The results of the indicate that education and patient satisfaction or dissatisfaction should be treated as two separate variables and not as part of the same construct (Mancuso, 1993).

Assessment of patient satisfaction is characterized by methodological complexity. Artifact

is inherent within patient responses to satisfaction tools. Results of this study may reflect the artifact of human courtesy (i.e., the social desirability of the patient's polite response to nursing care), as well as other conditions, which affect the satisfaction response of the patient. The ability of patients to evaluate technical-professional nursing behavior may depend upon the length of time in which the patient is involved with nurses' practices (Mancuso, 1993).

The Consumer Emergency Care Satisfaction Scale (CECSS) is based on the Risser PSS (Risser, 1975), using concept analysis of emergency care and personal experience in emergency nursing for further approaches to making it applicable to the emergency care setting. It was used in a descriptive, correlational study with a convenience sample (N=397) stratified by patient classification. Data were collected by the investigator from medical records and the hospital's information system followed by telephone or face-to-face interviews using the CECSS, a 20-question, 5-point Likert scale, to measure patient satisfaction. Study questions focused on how specific, individual patient differences related to patient satisfaction with emergency department (ED) nursing care. Frequencies, Pearson's correlations and stepwise multiple regression were used in the analysis of data. No individual patient differences served to predict patient satisfaction with nursing care. Patient satisfaction with ED nursing care was weakly and positively related to a self-perceived improvement in the patient's condition and to the patient's admission to the hospital. Patient satisfaction with ED nursing care contributed significantly to patient satisfaction with the emergency nursing care. Regression demonstrated that patient satisfaction with ED nursing care contributed significantly to patients' intention to return. The patient's psychological safety and information provided by the nurse during the patient's visit were found to be significant predictors of patient satisfaction with the emergency nurse (Raper, 1996).

Patient Satisfaction and the Computerized Patient Care Environment

Computers in the hospital have become widespread. In 1994 it was estimated that 30% of health care organizations had automated the documentation process (Adaskin, Hughes,

McMullan, McLean, & McMorris, 1994). The predictions in a recent Harris survey were that at least 80% of health care providers will be using a clinical computer based patient record system by the turn of the century (Hammond, Hales, Loback, & Straube, 1997). A director of health information services at a hospital in the north Texas area, estimates that 16 percent of that hospital's records are computerized (Federwisch, 1996) and that complete computerization throughout the system is expected by 1999. Widespread computerization has caused a change in the role of nursing. In using technology, nurses accept the technical responsibility of assuring that the clinical data is true, accurately interpreting the data, selecting appropriate interventions, and preventing or minimizing iatrogenic complications (Stone, 1995).

Whether the changing role of nurses in the use of computers has influenced patient satisfaction has not been studied. Nurses' unquestioning conversion to a computerized patient environment has concerned some nurse philosophers. Gadow (1984) discusses two paradigms in patient care, one of which is the scientific paradigm. The other, the empathic paradigm, involves nurses physically touching the patient's body. Care provided through a complicated network of machinery, like that found in an intensive care unit, is felt to be more alien to human dignity than non-mechanical forms of care. The complexity of computers provides them with a reality of their own, asserting their otherness. Technology makes more obvious the dilemma of reducing patients to a form of "objectness" without reducing them to the moral status of objects. Data from x-rays, biopsy, and probability tables are exchanged for the subjective experience of illness or dying. As long as the body is only a scientific object, decisions about it will be based upon external clinical interpretations, not upon the meanings and values these have for the patient. Otherness, originating in the scientific paradigm, the apparatus and the expert, threaten to disrupt personal integrity, and thus violate dignity and autonomy, by removing patients from the center of their own experience. The violation of dignity and autonomy is not the result of machines in patient care, but rather of the view of the body as a machine Technology extends the violation of

dignity and autonomy into forms perceptible enough not to be overlooked. Gadow states that, only when the body is experienced as more than an object is it possible to involve it in solving the problem of its symptoms (Gadow, 1984).

Zwolski (1989) considers the nature of the technical system. It is difficult for persons seeking treatment in the technical health care system to maintain their individual identity because the system tends to reduce individuals to their component parts. Many ill patients, when confronted with a technical health care system, trade dependency for technical intervention. Patients become dehumanized as their autonomy is diminished. The psychosocial and physical response of an individual to a particular technology is complex and variable; yet the response itself is an important factor in determining outcome. Nursing's mission is clearly defined as the diagnoses and treatment of human responses to actual or potential health problems (ANA, 1995). Zwolski advocates an ongoing assessment of the patients' responses to the technology they encounter in the health care system. This would broaden the scope of nursing and add to our current taxonomy (Zwolski, 1989).

Sandelowski (1988) writes about the paradigm conflict between nursing and reproductive technology. Techniques such as ultrasonography, amniocentesis and fetal monitoring have relegated the patient to the realm of subjectivity and ambiguity while machine-generated knowledge is located in the realm of objectivity and certainty. This has changed the longstanding bond between nurses and childbearing women. Nursing has uncritically accepted medical technology into its sphere of practice. Nursing knowledge gained from the patient history, clinical observation and patient examination has become inferior to machine-produced knowledge. Technology has minimized the nurse's role as empathetic toucher. Medical tools are not neutral objects, but rather can define and constrain caregiver-patient interactions (Sandelowski, 1988).

In a historical analysis, Fairman (1992) discusses two ways that nurses actively influenced the development of ICUs. The first was traditional practice and triage, and the second

was the search for knowledge. In the 1970s, "watchful vigilance of patients was obscured by enthusiasm for machines as the ICU became a technologic repository. The care of the critically ill patient entered into a realm where data from machines supplanted the intense observation of nurses and their expertise. As society became uncomfortable with the expanding boundaries of technology-supported patient care, the roots of ICUs were rediscovered with the understanding that nurses still influence the direction and focus of ICUs through traditional practices. These practices contribute directly to the successful recovery of critically ill patients and have empowered nurses in the political process of health care decisions, validating nurses' work (Fairman, 1992).

In a qualitative study, Cooper (1993) describes the paradoxical nature of the relationship between technology and care in the intensive care unit (ICU). Data were collected over a four-month period through observations of nurses, patients, and patient families in the ICU and through informal and formal interviews with nurses. Sixteen observations, lasting from two to five hours each, were conducted. Nine nurses were observed and interviewed from one to four times each. Transcribed field notes and taped interviews were checked for errors. Transcriptions were read twice for delineation of significant statements. The relationship between technology and care in the ICU was found to be paradoxical, holding in tension the objective values of science and the subjective values of human wellbeing. Technology simultaneously impeded care by alienating and dehumanizing both nurse and patient. Eyes were focused on the monitor and subjective patient needs went unnoticed. In some situations, nurses over-identified with the technology and overlooked patient concerns. From observing fearful patient responses the researcher concluded that technology can be an obstacle to human interactions. Families were reluctant to touch loved ones who were tethered to machines. Nurses were often distracted from the patient by the equipment. Patients experienced intimidating and frightening technology as an intrusion. The nurse considered manipulation of equipment or gathering data from the monitor, to be a patient

interaction. The patient did not see this attention to technology as an experience of caring. Finally, the data revealed that the technological environment impedes care by promoting power and knowledge differentials between the patient, family and the nurse. This power and knowledge differential has gone undocumented (Cooper, 1993).

Although the techniques for assessing, monitoring, and treating the acutely ill patient have been greatly enhanced by technology, a number of challenges are associated with its use. Major issues include depersonalization, the needs of families, patient and family rights and technology-driven increases in health care costs (Stone, 1995). The effect of these issues on patient satisfaction has not been studied. Nurses have not reflected on their changing role in the increasingly technical hospital in respect to quality patient care.

The patient care environment represents an important issue. The design of the computerized hospital environment has had little patient or nurse input. Already overcrowded with equipment, hospital architecture was not designed for bedside computers. In some hospitals, less than ideal terminal placement results in nurses being distanced from the patient's bedside (Barnason, Zimmerman, & Nieveen, 1995; Miller & Sheridan, 1992). The placement of computers at the bedside was an effort to have direct entry of patient data, however, when terminals with the capability of recording patient progress directly at the bedside are available, nurses have often not used this option. Nurses stated that it was difficult to compose progress notes while the patient and/or family was present. The patients were too often trying to converse with the nurse, making construction of a coherent note difficult or impossible (Pabst, Scherubel, & Minnick, 1996).

Good nursing care involves supervising the patient care environment as most patients attribute control of the patient environment to the nurse. Patients and family members or significant others were sampled in a qualitative study of patient satisfaction, and interviews took place in hospital rooms and lounges. The sample included 24 patients and 5 family members,

ages 15 to 84, with a variety of diagnoses. Virtually all patients mentioned some aspect of their environment as integral to good nursing care. Patients evaluated the quality of nursing care, in part, in terms of how well their room met their expectations, and they thought that nurses have some control over the effectiveness of the environment. The nurse's assuming a degree of responsibility for the patient's environment is seen as important to patient satisfaction. Nurses must be aware of the interplay of environment and patient well-being and employ principles of environmental psychology. The nurse's responsibility is to understand what an individual patient's response is to the environment and then assist the patient when that response is not positive. Nurses were assumed to be technically competent by these participants. Even when directly asked, patients seemed to have no particular orientation toward technical competence in nursing (Lynn & Sidani, 1995).

A comparison of paper documentation systems to computer documentation was discussed by Vlasses (1993) a nursing coordinator for a computer implementation project. Paper documentation systems have performed well for the content of nursing observations by providing an unobtrusive structure. These systems encouraged verbal communication for further explanation of patient situations. Computers require high degrees of internal logic. This internal consistency with supporting theoretically defined relationships is clearly reflected in screen design and content. A computer programmer imposes order on the data. It is through the window of the computer's logical structure and relationships that the nurse is asked to assess and diagnose patients. Thus the use of computerized systems interferes and interrupts the clinician's evolving judgment. Pre-structuring data will inhibit broad case-by-case analysis and the development of midrange theory since the structure will affect how data are visualized and conceptualized. Computers are biased toward empirical/analytic systems of logic. Rule-based systems effect nurse's clinical decision-making ability, and computers decrease opportunities for collegial dialogue. Vlasses considers the possibility that computerized documentation systems will

negatively impact knowledge development in nursing.

The effect of point of care technology (PCT) on the quality of patient care was studied in three hospitals. The objectives of the study were two-fold: (a) to examine the impact of PCT on the quality of patient care and (b) to describe the social consequences of computerization on the patient. A descriptive and quasi-experimental study of the impact of PCT using a convenience sample of 90 patients on medical/surgical nursing units was conducted in three acute care hospitals in the North East U.S. The nursing units were examined over time with a pretest and posttest on a control and experimental unit. The quality of patient care was the consequences or effects related to the computer in the room on the patient. These were measured by the PSI (Hinshaw and Atwood, 1982), the Patient Perception of Computer Related/Technology Related Care Instrument and the Joint Commission on Accreditation of Healthcare Organizations Chart Audit. Social impact was measured by the responses or opinions given during the patient interview. A convenience sample of 21 patients from the units with computers was interviewed using the Patient Interview Guide and 76% discussed technology or computers in their patients' rooms in a positive manner. The main null hypothesis, that there is no difference in the quality of patient care on nursing units with and without PCT, was rejected. While patients were generally very satisfied with their nursing care on all units, when controlling for time and the presence of the computer, patients who did not have PCT were more satisfied than patients in rooms with PCT. The charts of patients with PCT were less compliant to documentation standards. (Happ, 1993)

Nurses have voiced their concerns with the computerized hospital environment in studies of their own attitudes toward computers. Qualitative methods have been used to study nurses' attitudes toward computers. Twenty nurses were identified by their peers as informants for an interview study using a grounded theory approach at six months and one year after the implementation of a computer system. These nurses voiced negative attitudes during the implementation period of a computer system. On the whole, nurses felt torn between their valued

patient care activities and the necessity of learning to document by computer. The nurses worried about the risk to patient safety during the chaos and rush of the implementation period. Nurses who had previously used computers were more confident in using the keyboard, while those without computer experience tended to doubt their ability. Some reported avoiding practice in using the computer, some nurses thought that computerization readied them for the future, and in some cases, computerized procedures were viewed as obstacles to nursing care. Census availability, order entry and dietary information was found to be extremely useful aspects of the integrated hospital information system (Adaskin et al., 1994).

As a reflection on patient care, a computerized care planning system was examined three months and one year after implementation in a study including 139 nurses (Newton, 1995). The system was introduced and managed by external management consultants and venders. Survey and case study methods were utilized in the study. After three months, a negative shift in nurses' attitudes was found, these attitudes included perceptions that the care plans were inflexible, of increased workload, of reduced time with patients, of decreased patient individuality and of diminished nurses' autonomy. Seventy-six percent of the nurses maintained that the computerized care planning system had not been either beneficial or detrimental to direct patient care. Nurses used the computer effectively while maintaining the level of patient care, despite unfavorable attitudes. It was inferred that the nurses were giving the same quality of care in a shorter time. Interview data revealed criticism of the long assessment pathway, which had 48 screens. At three months the admission assessment had been reduced to 16 screens. Quantifiable data comparing paper and computer documents showed that the increase in the number of care plans was significant. Improvement was significant for planning and evaluation. An audit of care plans at one year indicated that patient data was duplicated in 350 instances in the progress notes. Using six indicators, computer care plans had a significant influence on care planning. The quality of care planning documents improved. No association was demonstrated

between positive attitudes to the computer and the percentage of computer care plans made (Newton, 1995).

Clearly, computer systems are becoming a present day part of nursing care. Further research into the presence of computers in the hospital environment is needed, focusing on the patient's response and outcomes. There is a gap in research with regard to effect of computerization on the patient and the patient's environment. This study was set in the ambulatory surgical setting in an attempt to respond to the current shift to outpatient procedures

Patient Satisfaction and Anxiety

Numerous studies of anxiety in the nurse-patient relationship, self-care, and characteristics of anxious patients have been undertaken by nurses. Anxiety is a palpable, but transitory, emotional state or condition characterized by feelings of tension and apprehension and heightened autonomic nervous system activity. Anxiety is a basic human emotion, a mechanism for coping with danger. It is a sequence of cognitive, affective, physiological and behavioral events that may be initiated by either stressful external stimuli or by a thought or idea that forecasts threat. Trait anxiety is the relatively stable characteristics of the personality, and the individual maintains this trait anxiety at a normal level for homeostasis. State anxiety is the transitory or acute condition that varies according to the threat of the experience. State anxiety lies at the core of the anxiety process, which involves stress, threat, physiological changes and behavioral reactions (Spielberger, 1966).

The antecedents to anxiety are reviewed in order to understand the relationship of anxiety to patient satisfaction. Whitley (1992) has proposed 11 antecedents to anxiety within the nursing diagnosis framework. They are (a) threat to self-concept, (b) unmet needs, (c) situational maturational crises, (d) threat to or change in role functioning, (e) threat in interaction patterns, (f) threat to or change in environment, (g) threat to or change in socioeconomic status, (h) unconscious conflict about essential values/goals in life, (i)

interpersonal transmission/ contagion, and (j) threat of death (Whitley, 1992). The antecedent of unmet needs coincides with unmet patient expectations.

Those antecedents specific to the presence of a computer within the patient care environment, and thus, in nurse-patient relationship include a threat in interaction patterns and a threat to or change in the environment. The computer potentially presents a threat to interpersonal transmission/ contagion. These three threats may cause a change in patient satisfaction and an increase in patient anxiety during any health care situation.

In-hospital patient anxiety is self-evident. Most people approach hospitalization with dread. Separation from home, loved ones, and usual routine leads to restless uneasiness for the majority of patients. This is aggravated by the hospital routine, which is designed primarily for hospital efficiency, not patient comfort. The strangeness of hospital odors and food heightens this separation anxiety. Fear may revolve around the diagnostic implications, fear of death or mutilation, fear of pain, fear of disability, fear of dependency and helplessness. The sense of powerlessness over pain is partially responsible for surgical patient's anxiety (Decker, 1979; Walding, 1991).

As anxiety levels rise, patients become angry, confused, or highly distressed, and have difficulty relaxing and coping. At even higher levels, patients are typically overly controlling and demanding, aggressive, complaining incessantly, making threats, being uncooperative or in contrast are excessively quiet. Other behavioral responses are withdrawal, increased verbalizations, inappropriate laughter and rapid speech (Dossey, 1996).

Within the health care system, the effects of anxiety can become overwhelming and detrimental to physical and emotional recovery. According to the National Institute of Mental Health, untreated anxiety may prolong hospitalization and complicate or exacerbate physical symptoms. Unrelieved anxiety can lead to disruption of treatment compliance and can contribute to poor treatment outcome, prolonged lengths of stay, early relapse, and alienation and

resentment toward health professionals (Biddinger, 1993; Blair & Ramones, 1996)

Evaluation of nursing care interventions involves measuring the outcomes of patient satisfaction and anxiety. To evaluate the effectiveness of a reduced-frequency prenatal visit schedule, maternal satisfaction, anxiety and perinatal outcome was measured. Eighty-one subjects were assigned to an alternative prenatal schedule or to the traditional prenatal care visit schedule. The experimental group attended 3.2 visits fewer than the traditional group. No significant difference was found between the two study groups on anxiety scores. Women in the experimental group were significantly more satisfied with both the provider and prenatal care system (Walker & Koniak-Griffin, 1997).

The relationship between patients' perceptions of nurse caring, satisfaction with nursing care and anxiety and the subject variables of age, gender, length of hospital stay and level of pain were examined in a descriptive study of 94 hospitalized medical patients. The patients completed the Holistic Caring Inventory (HCI), the Pain Thermometer, the PSI and the STAI. The results revealed a significant positive relationship between patients' perceptions of nurse caring and their satisfaction with nursing care. Each dimension of holistic caring was significantly related to patient satisfaction. The relationship between the perception of holistic caring and satisfaction was not confounded by the subject variables. Significant negative relationships were found between the HCI global, physical and sensitive caring scores and state anxiety. After controlling for subject variables only global HCI and physical care scores were significant predictors of state anxiety. Increases in pain were significantly related to decreases in HCI global scores, increases in state and trait anxiety, and increases in perceptions. This study suggests that holistic nurse caring is significantly related to patients' satisfaction with nursing and their level of anxiety (Williams, 1993).

The effects of specific preoperative information was measured using the outcomes of anxiety, patient satisfaction and demand for analgesia. Thirty Chinese men were studied following

transurethral resection of the prostate. The experimental group received a specific information pamphlet and a general preoperative counseling video. The control group received a video alone. The experimental subjects reported significantly lower anxiety levels postoperatively and a significantly higher level of satisfaction with the preoperative information than did controls. This study provides evidence of the effectiveness of preoperative information on postoperative outcomes. Preoperative information enables patients to participate more in their care and cope better with their surgery (Callaghan, Cheung, Yao, & Chan, 1998).

Patient Satisfaction and Pain

Hospitalized patients often experience intense pain, and the obligation to manage that pain and relieve a patient's suffering is an important part of the nursing role. The pain of hospitalized patients is generally acute; if left unmanaged, pain has been shown to adversely affect patient outcomes. Researchers have found that patients whose pain is well controlled are more satisfied with their care. Patients with more than one illness, those who have major surgery, the very young and the very old have the greatest risk for complications from unmanaged pain. Nursing is central to pain management efforts, educating patients, assessing their level of pain and administering analgesics. A strong theoretical link exists between timeliness and quality of nursing management of pain and desired patient outcomes. In situations where nurses respond only to requests for pain medication, intervals of inadequate pain control and heightened anxiety exist among patients and produce unwanted side effects and complications of care (ANA, 1995).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) approved revised standards for pain assessment and management in the hospital (Comprehensive Accreditation Manual for Ambulatory Care, 1999). Health care facilities must have processes in place to improve pain assessment and management for all patients in all settings. Patients must be surveyed to assess their satisfaction with pain management. Patients often misperceive that pain cannot be relieved safely and report satisfaction with pain management despite experiencing

pain that interferes with function (Pasero et al., 1999)

In a quasi-experimental study, 79 adult patients who had undergone major abdominal surgery were compared for degree of satisfaction with nursing care. Eleven matched pairs, one with patient controlled analgesia (PCA) and a traditional medication group were recorded. On the third postoperative day a questionnaire was completed regarding their satisfaction with the quality of nursing care. There was no significant difference in terms of quality of care index between the PCA and the traditional group. The PCA group did not report higher satisfaction. Younger and more highly educated patients were found to be especially critical and less satisfied with care (Koh & Thomas, 1994) .

Postoperative patient satisfaction was related to level of pain intensity, expectations of outcome, perceived concern by staff and helpfulness of treatments in a study of 119 post-orthopedic surgery patients. The authors created a 13-item patient satisfaction questionnaire for use in the study. Results showed that lower postoperative pain ratings were the best predictors of satisfaction and helpfulness of treatment. Preoperative pain status, expected level of postoperative pain and time waiting for pain medication were not significantly correlated with ratings of postoperative pain or satisfaction. The results support the notion that frequent assessment of and adequate treatment for postoperative pain can have a positive impact on patient satisfaction (Jamison et al., 1997).

Improving the consistency of assessment and management of pain resulted in a significant rise in the study hospital's patient satisfaction ranking with pain control when implementing a comprehensive pain management program geared toward surgical care. Indicators included more frequent assessment of pain, greater use of patient-controlled analgesia and reduced use of intramuscular pain medication. Within a year, patient satisfaction with pain control rose from the 67th percentile to the 89th percentile in a national database of more than 400 hospitals. Attitudes toward pain and pain relief were altered. A peer review organization pulled 47

charts for follow up a year after the project began, they found an increase in pain assessment from 7.9 times in the first 24 hours to 17.6 times. Pain management practices changed in the same-day surgery as well. Based on the indicators and the patient satisfaction surveys, the project clearly succeeded in improving pain management (Tousignant, 1999).

A pilot study to evaluate the effectiveness of a structured intervention aimed at improving pain management measured patient satisfaction. The patient satisfaction sub-scale was composed of five items, which used a four-point Likert scale. All clinical nursing units in the study revealed a positive response to overall patient satisfaction following the implementation of pain management standards (Barnason, Merboth, Pozehl, & Tietjen, 1998). As in the previous studies, pain management was again described as having an association with pain management.

Selected Demographic Variables

The selected demographic variables of interest are age, number of previous hospitalizations, and patient's computer use. Patients bring an understanding of their own subsystem to the hospital. Patient subsystems alter with the variables of age and gender. They also bring perceptions of the function of the nurse and the hospital. The number of previous admissions is an important indicator of prior health care experience (Mancuso, 1993).

No differences in satisfaction were found related to age, gender, ethnicity or health care provider in a methodological research study conducted for modifying and testing an instrument for measuring patient satisfaction outcomes with primary care providers who represent different disciplines (Marsh, 1999). The patient satisfaction with health care provider scale was adapted from a questionnaire indexing four satisfaction dimensions: access, humaneness, quality and general satisfaction. Following modification the questionnaire was administered to 167 adults with nurse practitioner or physician providers at a university-based, managed-care setting for the medically indigent. These results were inconsistent with the literature that reported that older individuals and women demonstrated higher levels of satisfaction (Koh & Thomas, 1994;

McCaffery & Hart, 1976). Demographic characteristics of patients played no role in a causal model of patient satisfaction research by Abramowitz, et. al., (1987). No individual, patient, demographic differences surfaced to predict patient satisfaction with emergency department nursing care (Raper, 1996). Computer anxiety research has generally focused on individuals using a computer. Anderson (1996) reports that the variables of computer experience, computer knowledge, sex, age, mathematics anxiety, the social impact of computers and playfulness have been studied. Results have varied on all attributes except experience. Higher computer anxiety is associated with less experience with computers.

Summary

Patient satisfaction is considered to be an important indicator of quality care. The match between patient expectations of nursing care and the care actually received is expressed as patient satisfaction. Nursing is a key determinant of patient satisfaction in the hospital setting. Service in a timely manner is an element in patient satisfaction. All patients mention some aspect of comfort in their environment as a part of quality nursing care. Technical care and interpersonal care are two elements in quality of care (Donabedian, 1982). Risser (1975) revised the factors of patient satisfaction to include technical, interpersonal and educational concepts. The incorporation of health maintenance behaviors, new and return business are long-term outcomes of patient satisfaction (Greeneich, 1993). Individual care and interpersonal contact are enduring concepts in qualitative and quantitative research studies (Lynn & Sidani, 1995). Satisfaction may not be directly related to quality but rather to interpersonal relationships (Cottrell & Grubbs, 1994).

Patient satisfaction is a highly utilized indicator of the quality of patient care because it has a number of desirable attributes. It tends to produce a negatively skewed distribution; that is, patients say they are satisfied no matter what the quality of care. Patients traditionally report high levels of satisfaction with nursing, potentially limiting the variation in responses necessary to identify quality problems (ANA, 1995). There is concern as to whether patients really have the

technical knowledge necessary to evaluate the quality of care they receive (Cottrell & Grubbs, 1994; LaRochelle & Pesto, 1989).

The negatively skewed distribution of patient satisfaction is a good thing for the evaluation of new health care delivery systems. It invariably gives a gold star when measured following the implementation of changes such new management methods (Cone et al., 1995; Hinshaw & Atwood, 1982; Munro et al., 1994). Although patient satisfaction provides valuable insights, it is not clear that it actually reflects quality of care (ANA, 1995).

Computer use in the hospital is widespread and the computerized environment is increasingly disruptive to interpersonal relationships and dialogue, violating dignity and autonomy. The patient's reduction to objectness is documented. (Gadow, 1984). Computers take away the patient's subjective identity (Zwolski, 1989). Computers constrain the nurse's interaction with patients. Technology has minimized the nurse's role as empathetic toucher (Sandelowski, 1988). The enthusiasm and attention to machines has changed the nurse's role with patients. In using technology, nurses have taken responsibility for verifying electronic data, interpreting data and selecting appropriate interventions and preventing or minimizing iatrogenic complications (Stone, 1995). Technology is an obstacle to human interactions. Computers encourage patient dependence (Cooper, 1993). Nurses exposed to bedside computers have expressed a distance from patients. Nurses have not used computers at the point-of-care finding they make patient interaction difficult (Barnason et al., 1995; Pabst et al., 1996).

Anxiety is the most commonly cited nursing diagnosis (Whitley, 1992). In-hospital anxiety is well documented. Many patients approach hospitalization with dread. Fear of death or mutilation, fear of pain, fear of disability, fear of dependency and helplessness are often present in hospitalized patients. The sense of powerlessness over pain is partially responsible for the surgical patient's anxiety (Decker, 1979; Walding, 1991).

Pain management in the hospital represents a nursing-sensitive outcome (ANA, 1995)

Study results indicate a deficit in nursing awareness and treatment of pain (McCaffery & Hart, 1976). Lack of nursing attention and management of pain are important predictors of patient satisfaction (Koh & Thomas, 1994; Tousignant, 1999). Postoperative pain is cited as a predictor of patient satisfaction (Jamison, 1997).

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The purpose of this study, which uses a correlational descriptive design, is to explore the association of selected variables with the satisfaction of patients admitted to the hospital for ambulatory surgery. The selected variables are collection of patient information by the nurse via computer, the patient's preoperative anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following pre-admission and demographic variables (age, number of previous hospitalizations, and computer use). A convenience sample of ambulatory surgical patients was the subject for this study.

Setting

This study was conducted in two 250-bed private hospitals in the North Texas area. Both of the hospitals are members of the same hospital corporation, are located in the same county, and are approximately the same size. The major known difference between them is that in one collection of patient data at the bedside is computerized and in the other it is not.

Computerized Hospital (A)

The computerized setting, referred to as Hospital A, has utilized the computers for the past five years. In Hospital A, all patient data is entered directly into a computer. At the bedside the nurses enter data into a handheld computer. The nurses chart at the nurse's station utilizing a keyboard and monitor.

The study participants in Hospital A were recruited initially in the pre-admission area. Prior to entering the pre-admission area, these patients were interviewed by clerical personnel for the collection of insurance information, then the patients completed radiology and blood work

screening. The consenting subjects filled out the State Trait Anxiety Inventory (STAI) and began completing the Patient Data Form (PDF) in the main lobby, which is a large spacious area with groupings of comfortable chairs and a television. From there, they met the pre-admission nurse and went to the pre-admission screening office, a room directly off the main lobby. There is a computer terminal with monitor in the room, along with two chairs and a small table. The patient finished the PDF while in the pre-admission screening room. The pre-admission screening procedure consists of the nurse sitting in front of a monitor, typing on a keyboard while asking questions of the patient. The patient sits in a chair against the wall; unable to see the information the nurse enters into the computer. Following the pre-admission interview and assessment, the patient left the hospital. The researcher collected the completed STAI and PDF from the pre-admission screening office where the patient left them.

The patient returned within 1 to 5 days and entered the main lobby for the planned surgical procedure. Patients were met by the nurse and taken to the ambulatory surgery department directly off the main lobby. Once in the ambulatory surgery department, each patient had a single room with a door; furniture included a stretcher and a number of chairs. They laid on the stretcher until transferred to the operating room. The patients filled out the STAI, Patient Satisfaction Instrument (PSI), and Pain Questionnaire when back in their rooms following their procedure and just prior to discharge. The postoperative time period ranged from 1 to 2 hours. Charting done at the patient bedside during this time was performed by the nurse using a handheld computer.

Non-computerized Hospital (B)

In the non-computerized hospital, referred to as Hospital B, the patients completed the STAI and began the PDF in the outpatient waiting room. Prior to entering the waiting room these patients were interviewed by clerical personnel for insurance information; then patients completed radiology and blood work screening. The waiting room contained approximately 15 chairs lining

the walls and a television. When summoned by the pre-admission nurse the patients walked across the hall for the pre-admission interview and screening. In the pre-admission office there were two rooms, one with a numbers of chairs and the nurse's desk against the walls. The other room contained an examining table. The pre-admission procedure involved the nurse asking a number of questions from a patient history form. The nurse writes the answers given by the patient on the form. Following the pre-admission interview and assessment, in the pre-admission office, the patient completed the PDF and left the hospital, leaving the forms in the pre-admission office where they were collected by the researcher. The patients returned to the hospital within 1 to 30 days. When they entered through the main lobby, they were met by the ambulatory surgery nurse who then took them to the ambulatory surgery department. There the patients were on stretchers in cubicles prior to and after their procedures. The patients completed the STAI, PSI and Pain Questionnaire in their cubicles before discharge. The postoperative period lasted from 1 to 2 hours. During that time the nurses charted at the bedside on a paper document.

Population and Sample

The population from which the convenience sample was drawn was ambulatory surgery patients in two private North Texas hospitals. The subjects were scheduled for minimally invasive gastrointestinal, cardiac, orthopedic, opthalmological, urological, or gynecological surgery. Data collection took place every day over a 3-week period in the computerized hospital and a 6-week period in the non-computerized hospital. The difference in data collection time in the two hospitals was due to the number of surgeries that each hospital was doing per day. More surgeries were performed per day in Hospital A.

Pre-study power analysis indicated the need for a sample of 114 patients from both hospitals. Sample size was calculated using the formula $N>50 + 8m$ (where m is the number of independent variables). This formula assumes a medium-size relationship between the

independent variables and the dependent variable, alpha = .05 and beta = .20 (Tabachnick & Fidell, 1996). In addition to patient satisfaction, this study included 8 variables.

An initial sample of 149 subjects was drawn from alert, oriented, ambulatory surgical patients, over the age of 18, who were able and willing to complete the study instruments and orally respond to assessment questions. One hundred and thirty patients completed questionnaires following ambulatory surgery and were included in data analysis. The final study sample consisted of 62 patients in the computerized hospital and 68 patients in the non-computerized hospital. Many of the patients who chose not to participate stated that they did not have time to complete the questionnaire due to work schedules. Nineteen of those who completed the initial questionnaires were not included in the final study analysis due to surgery cancellation, rescheduling, or return of incomplete questionnaires.

Protection of Human Subjects

The protection of human subjects occurred in the following ways:

1. The Human Research Review Committee at Texas Woman's University reviewed the study to consider subject protection. Approval was granted. (see Appendix A)
2. Permission to conduct the study was received from both the hospitals' executive committees. (see Appendix B)
3. In Hospital A, the hospital volunteers asked the patients if they would like to participate in the study, while the outpatient department business staff asked the patients in Hospital B. Upon patient verbal consent, the researcher identified herself to the subjects and gave them an oral description of the study including its purpose and significance. The subjects were informed of when and where the results of the study would be available. They were told that participation was voluntary, and that their decision concerning participation would not affect the care that they received. Anonymity was assured by using numbers instead of names in recording the data.

4. Each subject who participated in the study signed a consent form.

Instruments

The ambulatory surgery patients who consented to participate completed a consent form, the STAI and, following pre-admission, a PDF. These same subjects returned for ambulatory surgery at a later date. Following surgery and before discharge from the hospital, they completed the STAI, the Pain Questionnaire and the PSI. All forms were matched together for each individual subject. The nurses in the pre-admission and ambulatory surgery departments of both hospitals completed the Nurse Demographic Data Form.

The Risser Patient Satisfaction Instrument (PSI) (Risser, 1975) was used to measure patient satisfaction in this study. The variables being measured by this instrument are patient attitudes toward nurses and nursing care. This self-reporting scale includes 25 items across three sub-scales: (a) technical-professional behavior of the nurse, (b) interpersonal-educational items which deal with the social aspects of nursing care as well as the information exchange between patient and nurse, and (c) interpersonal-trusting behaviors or relationships. Prior to administration, the researcher modified it; this involved clarification of some items and addition of several items directed towards computer use. The changed items from the scale as used by Hinshaw and Atwood (1982) were questions 2, 9, 10, 11, 12, 13, and 25 – 30. Items were changed to be applicable in the ambulatory surgery setting. Two items containing the word computer were added. This Instrument was modified to contain 30 items. (see Appendix E)

Responses to each item are rated on a scale of 1 (not at all) to 4 (very much so). A rating of 4 indicates the presence of a high level of satisfaction. To obtain total scores for the PSI, the item scores are added after reversing negative item scores. The higher the score, the higher the level of satisfaction. While data were collected for 30 items, 15 items remained for analysis following data reduction.

In previous studies of in-hospital patients, reported alpha reliability for the total scale was 0.91. The alpha values for each of the three sub-scales were 0.64 (technical-professional), 0.83 (interpersonal-educational) and 0.82 (interpersonal-trusting) Convergent and discriminant validity of the PSI provided an estimate of moderate to strong construct validation. The technical-professional and trusting sub-scales were strong with weak to moderate substantiation for the education sub-scale (Hinshaw & Atwood, 1982). An item from the technical-professional subscale is "The nurse gives good advice". From the interpersonal-educational scale an item is, "The nurse gives directions at just the right speed" and "The nurse is understanding in listening to a patient's problems" exemplifies the interpersonal-trusting scale.

The Cronbach's coefficient alpha for the total scale with the study sample was .86. Based on the item-total correlations presented in Chapter IV, the PSI was modified to be a 15-question scale. The alpha coefficient for the remodified scale was .92. The final instrument contained questions 3, 4, 6, 7, 10, 11, 15, 16, 17, 18, 22, 24, 25, 26 and 27.

The State-Trait Anxiety Inventory (STAI)(Spielberger, 1983) was used to measure state anxiety. The STAI is a 40-question self-evaluation questionnaire, consisting of the S-Anxiety (state) and the T-Anxiety (trait) scales. The 20-item S-Anxiety scale (Form Y-1) was used for data collection in this study. The STAI has been used extensively in research and clinical practice; it evaluates how respondents feel "right now, at this moment." Responses are rated on a scale of 1 (not at all) to 4 (very much so).

Each STAI item is given a score of 1 to 4. A rating of 4 indicates the presence of a high level of anxiety for 10 S-Anxiety items. A high rating indicates the absence of anxiety for the remaining 10. To obtain scores for the S-Anxiety scale the 20 item scores are added after reversing negative item scores. The higher the score, the higher the level of anxiety.

The essential qualities evaluated by the STAI S-Anxiety scale are feelings of apprehension, tension, nervousness and worry. Scores are expected to increase in response to

physical danger and psychological stress. The S-Anxiety scale has been found to be a sensitive indicator of changes in transitory anxiety experienced by patients and patients. It has been used extensively to assess the level of S-Anxiety induced by unavoidable real-life stressors.

Normative data are available for general medical and surgical patients on the state measure. Stability as measured by test-retest coefficients is low to moderate (.16 to .62). Low stability coefficients were expected because a valid measure of state anxiety should reflect the influence of unique situational factors that exist at the time of testing. The internal consistency reported in the test manual, for general medical and surgical patients, for the S-Anxiety scale is .92 as estimated by Cronbach's coefficient alpha. Concurrent-convergent divergent and construct validity of the STAI has been established (Spielberger, 1983). In this study the acronym STAI will refer to the S-Anxiety portion of the instrument. Its coefficient alpha with this sample was preoperative .92 and postoperative .91.

The Patient Data Form (PDF), a researcher-developed form, was used to collect data about patient satisfaction following pre-admission along with demographic variables (e.g. age, number of previous hospitalizations, gender, diagnosis) (see Appendix F). It was validated by four nurse researchers and piloted on a group of ambulatory surgical patients.

The Pain Questionnaire (PQ) is made up of four items with linear scaling used to measure perceived postoperative pain intensity and satisfaction with pain management (see Appendix G). The modified, visual analog scale is a horizontal line with ratings of 0 to 10. The questions asked the current level of your pain; rate your satisfaction with pain management following surgery; rate your level of pain relief following surgery and rate the nurses' helpfulness with your pain relief following surgery. It was developed by the researcher and was validated by four nurse researchers before piloting with a group of ambulatory surgical patients prior to its use in this study. Patients seemed to find the form easy to use.

Nurse Demographic Data Form (NDDF), a researcher-developed form, was used to collect data about years of experience with computers, computer use, computer comfort, and perceived work satisfaction (see Appendix H). It was validated by four nurse researchers and piloted on a group of ambulatory surgical nurses to establish face validity.

Data Collection

Computerized Hospital (A)

Data collection took place every weekday for 3 weeks in Hospital A. Patients scheduled for ambulatory surgeries were assigned a time to come to the hospital for pre-admission screening. On arrival at the hospital, the patient was directed to the laboratory and x-ray areas to be screened for surgery. When the tests were complete, the patients entered the main lobby and identified themselves to the hospital volunteers at the information desk. The volunteers filed their charts according to arrival time for the pre-admission nurse, and asked the patients if they were willing to be subjects in the study. Upon verbal consent the researcher identified herself to the subjects and gave them an oral description of the study including its purpose and significance. The subjects were informed of when and where the results of the study would be available. They were told that participation was voluntary, and that whether they decided to participate or not would in no way affect their care. In a comfortable place in the main lobby, the patients completed the STAI and began the PDF. The pre-admission nurse then called the patient to the pre-admission office where an interview was conducted. The nurse sat in front of a monitor using a keyboard to enter patient data directly into a computer. The nurse did a physical assessment of the patient. Following pre-admission the patient completed the pre-admission satisfaction questions on the PDF and left the hospital. The researcher collected the completed STAI and PDF from the pre-admission screening office where the patient left them.

All patients in the computerized hospital returned within 1 to 3 days for their procedure. On the day of the scheduled surgery the patients entered the hospital and were escorted into the

ambulatory surgery department by the nurse. They were prepared and sent to surgery. During all direct patient care the nurse carried a handheld computer and entered patient data. On return to the ambulatory surgery department the researcher approached the patient in their room and asked them to complete the STAI, PSI and PQ just prior to discharge. The researcher picked up the completed forms, matched them to the pre-admission forms, and removed all names from the forms.

The nurses in the outpatient surgery department were asked to assist with the study by serving as participants. All consenting nurses (n=9) completed the NDDF.

Non-Computerized Hospital (B)

Data collection took place every weekday for 6 weeks in the non-computerized hospital. Patients scheduled for ambulatory surgery came to the outpatient department of the hospital for pre-admission screening at a convenient time for them. At that time the pre-admission clerical personnel did the pre-admission paperwork. The patient was then directed to the laboratory and x-ray areas, as required to be screened for surgery. When the tests were complete the patients returned to the outpatient department and identified themselves to the clerical personnel. The pre-admission clerical personnel filed their charts according to arrival time for the pre-admission nurse. The pre-admission clerical personnel asked the patients if they were willing to be subjects in the study. Upon verbal consent, the researcher identified herself to the subjects and gave them an oral description of the study including its purpose and significance. The subjects were informed of when and where the results of the study would be available. They were told that participation was voluntary and that there decision would in no way affect their care. In the outpatient department lobby the patients completed the STAI and began the PDF. The pre-admission nurse then called the patient to the pre-admission office across the hall where an interview was conducted. Patient information was recorded by pen-and-paper. The nurse did a physical assessment of the patient. Following pre-admission the patient completed the pre-admission

satisfaction questions on the PDF. The patient returned the form to the researcher and left the hospital. Patients in the Hospital B returned for their procedure anywhere from 1 to 30 days after the pre-admission screening. On the day of the scheduled surgery the patients entered the hospital and were escorted into the ambulatory surgery department by the nurse. They were prepared and sent to surgery. In the ambulatory surgery department, patient information was taken at the bedside by pen-and-paper. On return to the ambulatory surgery department the researcher approached the patient in their cubicle and asked them to complete the STAI, PSI and PQ just prior to discharge. The researcher picked up the completed forms and matched them to the pre-admission forms. At that time the researcher removed all names from the forms.

The nurses in the outpatient surgery department were asked to assist with the study by serving as participants. All consenting nurses (n=7) completed the NDDF.

Treatment of Data

Description of the patient and nurse groups was done using percentages, frequencies, means and standard deviation. Following the examination of data that were clearly descriptive in nature, all variables measured on a continuous scale were examined for normality, linearity, and homoscedasticity to determine whether the use of multiple regression would be appropriate for examining the interrelationship of selected variables and their prediction of patient satisfaction (Norusis, 1998). The researcher originally planned to use of multiple regression for analyzing the relationships among the variables, with patient satisfaction serving as the dependent variable. As will be further discussed, the patient satisfaction variable did not meet the necessary assumptions. Transformation of the dependent variable patient satisfaction was performed using four major methods: log, square root transformation, reflect inverse transformation, and squared transformation. These transformations were unsuccessful in that the patient satisfaction variable continued to have a skewed distribution, not meeting the requirements of a normal distribution. Other variables that did not demonstrate a normal distribution were preoperative anxiety,

postoperative pain, satisfaction with pain management, and satisfaction with pre-admission procedure. Since nonparametric statistic tests provide an alternative when the assumptions of normality are not met (Pett, 1997), the hypotheses were altered slightly and appropriate nonparametric statistics were selected for their analysis. As noted by Pett (p. 17), "...parametric tests are more powerful than nonparametric tests only if the assumptions of the parametric test under consideration have been met". T-tests were done on all normally distributed ordinal level variables to determine whether there were significant differences between the patients in the two settings. Chi-square statistics were done to determine whether there were significant differences between the nurses in the two settings (Polit, 1996).

For Hypothesis 1, the Spearman rank-order correlation coefficient test was used to examine the relationships between the independent ordinal-level variables and patient satisfaction. A point biserial correlation was used to examine the relationship between the variable of computerized and non-computerized collection of patient information and patient satisfaction since this independent variable was dichotomous. Hypothesis 2 was addressed by performing a Wilcoxon signed ranks test to compare differences between pre-admission anxiety and postoperative anxiety in the entire group. Hypothesis 3 was addressed by using a Mann-Whitney *U* test to determine if the mean pre-admission and postoperative anxiety in Hospital A was significantly higher than at Hospital B. Hypothesis 4 was answered by performing a Spearman rank-order correlation coefficient. The internal consistency of the PSI and STAI was estimated using coefficient alpha. The reliability of the PSI was further improved by carrying out a principal components analysis in conjunction with coefficient alpha for the purpose of item reduction. Analysis of data was accomplished by the use of Statistical Packages for the Social Sciences (SPSS) for Windows.

CHAPTER IV

ANALYSIS OF DATA

Introduction

This chapter presents the results of a correlational descriptive study examining patient satisfaction and its associated variables. The major purpose of this study was to explore the relationship of selected variables with the satisfaction of patients admitted to the hospital for ambulatory surgery. The findings of further exploratory analysis are reported as well. The study was guided by a theoretical framework based on the General Systems Theory (von Bertalanffy, 1966).

This chapter is divided into three sections. The first describes the patient and nurse samples of the study. Frequencies, percentages, means, standard deviations, and chi-square tests are reported to compare the sample from Hospital A with Hospital B.

The findings reported in the second section relate to the four hypotheses. This section explores the associated variables of patient satisfaction necessary to address Hypothesis 1. The required assumptions of regression analysis, homogeneity of variance and independence of observations were explored. Examining the distribution of the dependent variable detected departures from the regression assumptions (Norusis, 1998). Data transformations were unsuccessfully attempted and reported. The Spearman rank-order correlation coefficient was used as a nonparametric alternative to examine the relationships between the associated variables and patient satisfaction (Pett, 1997). For Hypotheses 2 and 3, Wilcoxon Signed Ranks and Mann-Whitney *U* tests were performed to explore the possible changes in anxiety. Hypothesis 2 examined possible changes in anxiety for the total sample from pre-admission to

the postoperative period. Hypothesis 3 examined these possible changes by patient groups (i.e., Hospitals A and B). Pain was correlated with pain management satisfaction utilizing the Spearman rank-order correlation in the ambulatory surgery setting to address Hypothesis 4

The third section reports the examination of the instruments used to gather data in the study. Sample-specific reliabilities of the preoperative and postoperative State Trait Anxiety Inventory (STAI) are provided. Refinement of the PSI, using a combination of principal components and Cronbach's alpha is described (since this procedure was necessary prior to using the PSI for other analyses). Sample-specific reliability of the refined PSI was reported as estimated with this sample. The PSI was correlated with a 1-item patient satisfaction scale to investigate concurrent validity.

Description of the Sample

Patient Sample

The convenience sample for this study was selected from patients who entered either one of two private hospitals for pre-admission procedures prior to ambulatory surgery. Of the total available population, 149 patients completed preoperative questionnaires and 130 completed both preoperative and postoperative study instruments. Participants who met the study criteria were 18 years old and were able and willing to complete the questionnaires. In Hospital A, the sample consisted of 62 patients; in Hospital B, the sample consisted of 68 patients. Of the approximately 20 patients who were invited but chose not to participate, most stated that they did not have time to complete the questionnaires due to work schedules. Nineteen of those who finished the initial questionnaire did not complete the postoperative questionnaires due to surgery cancellation, rescheduling, or the returned follow-up questionnaires were incomplete.

Although 130 preoperative and postoperative matched surveys were analyzed, not all respondents completed all of the questions; thus the total number of responses does not equal 130 for all analyses. Several subjects left from 1 to 4 questions on the PSI unanswered. Two subjects did not respond to one question on the STAI. Diagnosis was omitted by 2, number of

Table 1

Demographic characteristics of the patient sample

Variable	Hospital A		Hospital B		Total Group	
	N	%	N	%	N	%
Age	N=130					
18 - 33	24	18	16	12	40	30
34 - 48	19	15	22	17	41	32
49 - 63	15	12	12	9	27	21
64 - 78	2	2	15	11	17	13
79 - 100	2	2	3	2	5	4
Gender	N=130					
Female	40	31	46	35	86	66
Male	22	17	22	17	44	34
Diagnosis	N=128					
Ortho	24	18	14	11	38	29
ENT	6	5	4	3	10	8
Abdominal	12	9	9	7	21	16
Ob/gyn	18	14	8	6	26	20
Eye	0	0	4	3	4	3
GI procedure	0	0	23	18	24	18
Heart Cath	0	0	5	4	5	4
Number of Hospitalizations	N=119					
0 – 5	41	34	46	35	87	69
6 – 10	15	12	15	12	30	24
11 – 35	1	1	1	1	2	2
Computer Use	N=127					
Never	9	7	29	22	31	24
Once a week	7	6	8	6	15	12
Several	14	11	9	7	23	18
Daily	30	24	21	16	51	40

Note. Percentages have been rounded.

hospitalizations by 11, and computer use by 3 respondents. Missing values were excluded from data analysis.

Ages of the total sample varied from 18 to 99 years with a mean age of 44.35 years (SD = 18.69). For the Hospital A sample, the mean age was 40.34 years (sd = 17.66). The Hospital B sample had a mean age of 48.00 years (sd = 18.98). A chi-square statistic showed the

two groups differed significantly in age (X^2=59.26, p=.00), with the non-computerized Hospital B having an older patient group.

The gender composition of the total sample was 44 males and 86 females. The gender of the patients in the Hospital A sample was 22 males and 40 females. In the Hospital B sample, there were 22 males and 46 females. A chi-square statistic indicated that the gender of the two groups did not differ significantly between Hospitals A and B (X^2=.14, p=.72).

The diagnoses of 128 patients were recorded in 7 categories. There was a total of 38 orthopedic (Ortho) surgery patients, 24 in Hospital A and 14 in Hospital B. Orthopedic procedures done on an ambulatory surgery basis were arthroscopies involving the knee, elbow or shoulder. A total of 10 patients had ear, nose and throat (ENT) surgery, 6 in Hospital A and 4 in Hospital B, with the majority having such procedures as a tonsillectomy. Abdominal surgery accounted for a total of 21 patients, 12 in Hospital A and 9 in Hospital B; these surgeries involved any laporoscopic procedures such as a biopsy. Obstetrical/gynecology (Ob/gyn) surgery totaled 26 patients, 18 in Hospital A and 8 in Hospital B, examples of Ob/gyn surgery were tubal ligations, and biopsies. In Hospital B, 4 patients had eye surgery, 23 had gastrointestinal (GI) procedures and 5 heart catheterizations (heart cath). Some examples of the GI procedures were

Table 2

Results of calculated chi-square analysis for diagnosis by hospital setting

		Diagnosis						
		Ortho	ENT	Abdominal	Ob/gyn	Eye	GI	Heart Cath
Hospital A	f	24	6	12	18	0	0	0
	f_e	17.8	4.7	9.8	12.2	1.9	11.3	2.3
Hospital B	f	14	4	9	8	4	24	5
	f_e	20.2	5.3	11.2	13.8	2.1	12.8	2.7
Total		38	10	11	26	4	24	5

chi-square (6, N = 128) = 39.96, p = .00

Note. f = observed frequency, f_e = expected frequency

esophagogastroscpy, esophagogastroduodenoscopy and colonoscopy. These diagnosis were not represented in Hospital A. A significant chi-square statistic for the analysis of the data presented in Table 2 indicates that there is a difference between patients' diagnoses in Hospitals A and B. Observation of frequencies in the table indicates that Hospital A does many more ortho procedures, while Hospital B does more GI procedures.

The number of times that patients had previously been hospitalized ranged from 0 to 35. The mean number of times was 3.97 (SD = 3.06), the median was 3 and the mode was 2. Using a significance level of $p \leq .05$, a chi-square statistic showed the patients in hospitals A and B did not differ significantly in number of previous hospitalizations.

One hundred and twenty seven patients reported computer use. The rankings of the total group were as follows: 38 patients = never; 15 = once a week; 23 = several times a week and 51 patients = daily. The results of the chi-square statistic presented in Table 3 indicate that there was a difference between the two patient groups from Hospital A and Hospital B and computer use. By inspecting the relative frequencies in the table, it can be observed that the patients in Hospital B use a computer less often than those in A.

Table 3

Results of calculated chi-square analysis for patient computer use by hospital setting

		Computer Use				
		Never	Once a week	Several	Daily	Total
Hospital A	f	9	7	14	30	60
	f_e	18	7.1	10.9	24.1	60
Hospital B	f	29	8	9	21	67
	f_e	20	7.9	12.1	26.9	67

chi-square (3, N = 127) = *12.92*, p = .01

Note. f = observed frequency, f_e = expected frequency

Computer use has a relationship with age. The Spearman rank-order correlation coefficient was used to examine the extent to which the patient's age was associated with their

computer use. Computer use has a significant (p = .00) moderate correlation (r_s = -.38) with age. The younger patient sample in Hospital A used the computer more often than the patient sample from Hospital B. Fourteen percent of the variance (r_s^2 = .14) in computer use is explained by age.

Nurse Sample

Demographic data were requested from all the nurses working in the pre-admission department and ambulatory surgery department of the two study hospitals. The entire sample included 16 nurses, 9 in Hospital A and 7 in Hospital B. This data consists of 11 variables involving experience, education, satisfaction with nursing, exposure to computers at work and at home. All ordinal level variables approximated a normal distribution. The mean number of years in nursing for the entire sample was 20.31 years (SD = 7.23) with a range from 6 to 31 years. Hospital A nurses had a years in nursing mean of 22.22 (sd = 4.89). For Hospital B, years in nursing mean was 17.86 (sd = 9.28).

The mean number of months employed in the study hospitals for the entire sample was 125.38 or approximately 10 ½ years (SD = 102.54). The mean for Hospital A was 110.11 months (sd = 83.98) and for Hospital B, 145.00 months (sd = 126.83). The mean number of months employed in the ambulatory surgery department for the entire sample was 59.38, approximately 6 years (SD = 41.18). The mean for Hospital A was 67.33 months (sd = 37.65) and for Hospital B, 49.14 months (sd = 46.18). Using a significance level of ($p \leq .05$), a chi-square statistic showed the groups of nurses representing the two study hospitals did not differ significantly in years of nursing, months of employment in study hospital, or number of months employed in ambulatory surgery department.

The educational preparation of the entire sample of nurses (N=16) consisted of 6 with an Associate Degree in Nursing (ADN), 8 with a Bachelor of Science in Nursing (BSI), and 2 with vocational nursing certificates (LVN). Fifteen of the 16 participants reported that they enjoyed nursing. Two members of the entire sample of nurses had undertaken formal computer education; both nurses worked in Hospital A, the computerized hospital. Using a significance

Table 4

Demographic characteristics of the nurse sample

Variable	Hospital A		Hospital B		Total Group	
	N	%	N	%	N	%
Years Nursing						
4– 10	0	0	2	13	2	13
11– 20	3	19	3	19	6	38
21-30	5	31	1	6	6	38
31– 40	1	6	1	6	2	13
Months Employed at hosp.						
0– 12	1	6	1	6	2	13
13 – 60	2	13	3	19	5	31
61 – 240	5	31	1	6	6	38
241 – 306	1	6	2	13	3	19
Months in Amb.Surgery						
9– 12	1	6	2	13	3	19
13– 36	2	13	1	6	3	19
37 – 60	1	6	3	19	4	25
61 – 144	5	31	1	6	6	38
Degree						
AND	3	19	3	19	6	38
BSN	5	31	3	19	8	50
LVN	1	6	1	6	2	13
Enjoy Nursing						
Yes	9	56	6	38	15	94
No	0	0	1	6	1	6
Nursing Satisfaction						
0 – 6	4	25	0	0	4	25
7– 10	5	31	7	44	12	75
Length of computer use						
0- 24	0	0	3	19	3	19
25– 36	4	25	1	6	5	31
37 – 60	2	13	1	6	3	19
61 – 96	3	19	2	13	5	31
Computer at Home						
Yes	9	56	3	19	12	75
No	0	0	4	25	4	25
Formal computer education						
Yes	0	0	2	13	2	13
No	9	56	5	31	14	88
Computer use						
Several times a week	1	6	3	19	4	25
Daily	8	50	4	25	12	75
Computer comfort						
0-4 uncomfortable	0	0	1	6	1	6
5-7 moderate	9	56	4	25	13	81
8-10 comfortable	0	0	2	13	2	13

Note. Percentages have been rounded.

level of ($p \leq .05$), a chi-square statistic showed that the two groups of nurses in the study hospitals did not differ significantly in educational preparation.

The entire sample of 9 nurses from Hospital A had computers in their own home, as compared to 3 nurses in Hospital B. A chi-square statistic result, reported in Table 5, was significant (p=.02), indicating that more nurses in Hospital A had computers in their homes than did those in Hospital B.

Table 5

Results of calculated chi-square analysis for nurses computer at home by hospital setting

		Computer at home		
		No	Yes	Total
Hospital A	f	0	9	9
	f_e	2.3	6.8	9
Hospital B	f	4	3	7
	f_e	1.8	5.3	7
chi-square (1, N = 16) = 6.89, p = .02				

Note. f = observed frequency, f_e = expected frequency

Computer use varied from several times a week for 4 nurses in the entire group to daily for 12 nurses. A chi-square statistic result indicated there was no significant difference ($p \leq .05$) in computer use between the nurses in Hospital A and the nurses in Hospital B. Enjoyment of nursing was a yes, no, response. One nurse in Hospital B reported no enjoyment of nursing. All nine nurses in Hospital A reported enjoying nursing. The nurses in Hospital A and the nurses in Hospital B did not vary significantly in enjoyment of nursing. Formal computer education was a yes, no, response. Two nurses in Hospital B reported formal computer education. A chi-square statistic result indicated there was no significant difference ($p \leq .05$) between the nurses in Hospital A and the nurses in Hospital B in formal computer education.

The mean length of computer use for the entire sample is 48.38 months (SD = 22.74), approximately 4 years. Hospital A nurses had a mean length of use of 50 months (sd = 19.27).

Hospital B nurses had a mean length of use of 46.29 months (sd = 28.08). The mean computer comfort score for the entire group is 6.88 on a scale of 0 to 10. Hospital A nurses had a mean comfort of 6.78 (sd = 1.20). Hospital B nurses had a mean computer comfort level of 7.00 (sd = 2.52). Using a significance level of ($p \leq .05$), a chi-square statistic showed Hospital A and B nurses did not differ significantly in length of computer use or computer comfort.

Nursing satisfaction was measured on a 0 to 10 scale. Nursing satisfaction for the entire group was rated was 7.50 (SD = 1.5). Nurses in Hospital A reported a mean satisfaction score of 6.78 (sd = 1.39). Hospital B nurses reported a mean satisfaction score of 8.43 (sd = 1.13). A chi-square statistic showed the two nursing groups differed significantly in nursing satisfaction (X^2=7.87, p = .02). The nurses in Hospital B had a higher satisfaction score than those in Hospital A. In order to investigate the association of nurse satisfaction with patient satisfaction, a Spearman rank-order correlation coefficient test was used. The results of this analysis (r_s = -.14, p = .61) indicated that patient satisfaction was not significantly associated with nurse satisfaction.

Findings

The specific study aims related to the exploration of the variables related to patient satisfaction were to (a) examine the relationships between each of the selected variables and patient satisfaction, (b) determine whether the ambulatory surgical patient's reported anxiety changes between the preoperative and postoperative period, (c) determine whether there is a difference between the reported anxiety scores of patients treated in the computerized or non-computerized hospital settings, and (d) determine whether patients with less pain at the time of discharge will have higher ratings of satisfaction with their pain management. These aims were addressed through a descriptive correlational study conducted in two hospital settings with ambulatory surgical patients. While the two hospital settings used were selected based on their similarities, a major selection criterion distinguishing the two was that one hospital was computerized (i.e., the nurse used a computer when collecting and recording patient information)

and one was not computerized. This section presents findings as they pertain to the study's specified hypotheses guiding the investigation.

Hypothesis Number One

Hypothesis 1 states: Patient satisfaction is significantly associated with the following variables: collection of patient information by the nurse via computer, the patient's preoperative anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following pre-admission and demographic variables (age, number of previous hospitalizations, and computer use). Hospital A collected patient information via computer and Hospital B did not. The patient's reported preoperative anxiety level (Staipre) was a calculated sum of all the items on the pre-admission STAI. Postoperative pain was indicated by the patient's rating of pain intensity by marking on a line with a scale of 0 to 10. The response to the first question on the pain questionnaire, "rate the level of your pain", was used as the data point (Postpain) for the statistical analysis. Pain management (Painmang) was calculated from the second question "rate your satisfaction with pain management following surgery". Pre-admission rating of satisfaction (Presat) was measured on a 0 to 10 scale by circling the correct level on the patient data form. The question asked was, "rate your satisfaction with your hospital pre-admission". Patients entered their age and number of previous hospitalizations (Numhosp) on the patient data sheet. Computer use (compuse) was circled on a scale of never, once a week, several times a week, or daily.

Assumptions of regression analysis

Initially, the intent was to use multiple regression as a statistical method for exploring the influence of selected variables on the dependent variable of patient satisfaction. Since important prerequisites of regression analysis are maintaining the required assumptions of normal distribution, homogeneity of variance and independence of observations, these assumptions were addressed by examining the distribution of the dependent variable. If the assumptions required

for a regression analysis are met, the dependent variable should be approximately normally distributed.

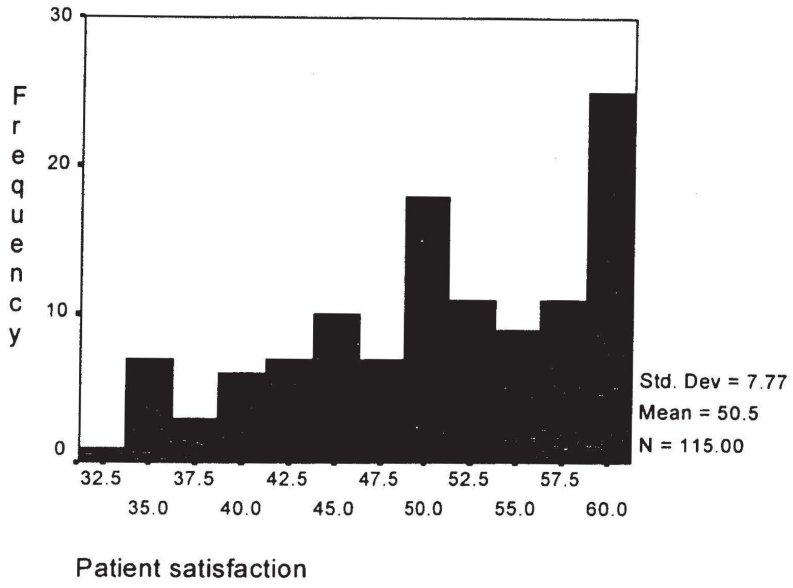


Figure 2. Untransformed patient satisfaction distribution

The distribution of the dependent variable patient satisfaction (Figure 2) was negatively skewed with multiple peaks. The skewness coefficient was -.42, and the kurtosis -.91, indicating that the distribution lacked normality (Pett, 1997). In an attempt to proceed with a multiple regression analysis, the patient satisfaction data were transformed. Figure 3 presents four transformations as suggested in the literature: squared, reflect inverse, square root, and log (Ferketich & Verran, 1994; Pett, 1997). The histograms continued to indicate a negatively skewed distribution with multiple peaks. The Kolmogorov-Smirnov (K-S) Lilliefors statistic indicated that the deviations from normality of the transformed patient satisfaction data were sufficiently large to conclude that the distributions were not normal. The test results for the transformations were as follows: squared (K-S (130) = .13, p = .00), reflect inverse (K-S (130) = .16, p = .00), square root (K-S (130) = .13, p = .00), and log (K-S (130) = .14, p = .00). These attempts at data transformation were unsuccessful.

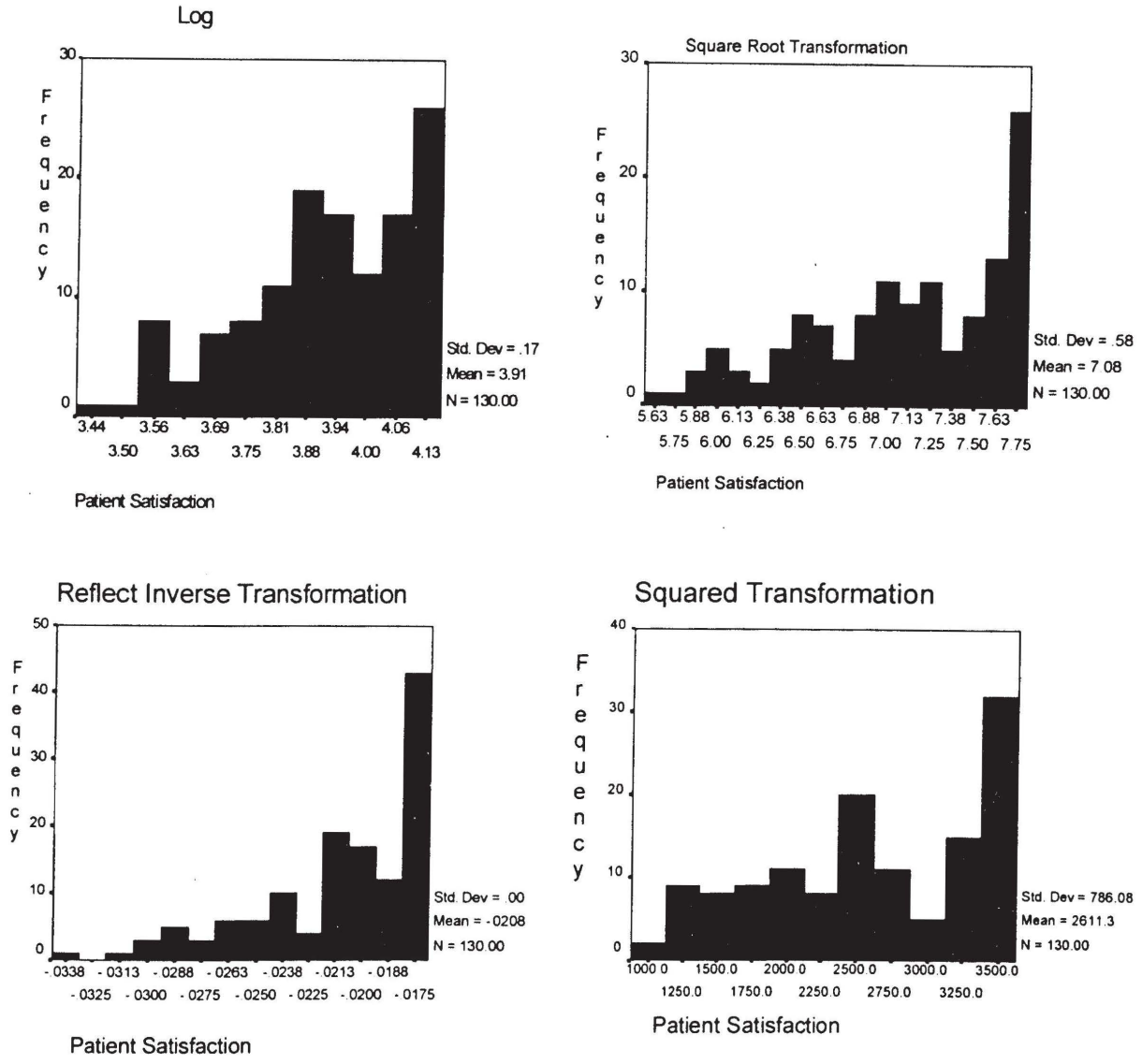


Figure 4. Data transformation of dependent variable patient satisfaction

Homogeneity of variance of the two hospital groups for the patient satisfaction variable was tested using the Levene test. The result indicated that the null hypothesis of equal variances would fail to be rejected because the significance level (p =.55) was greater than alpha = .05. The study groups, therefore, do show homogeneity of variance for patient satisfaction.

Table 6

Tests of normality for study variables

Variable	K-S	df	p	Skew	Kurtosis	Histogram	Stem-and-Leaf
Staipre	.09	115	.02	.58	.11	3 peaks	1 extreme
Postpain	.15	115	.00	.09	-1.16	2 peaks	0 extreme
Painmang	.16	115	.00	-1.00	.79	multiple peaks	1 extreme
Presat	.26	115	.00	- .02	6.52	1 peak	0 extreme
Age	.10	115	.01	.50	- .43	multiple peaks	1 extreme
Numhosp	.16	115	.00	.68	- .12	1 peak	1 extreme

The Kolmogorov-Smirnov Lilliefors statistic shown in Table 6 indicates that the deviations from normality are sufficiently large to conclude that the distributions of the selected variables are not normal. A $p \leq .05$ indicates that the distribution is significantly different from a normal distribution.

This exploration of the assumptions of multiple regression analysis produced the following results. Patient satisfaction, as well as the other study variables, was not normally distributed. Transformation of patient satisfaction, the dependent variable, was not successful and did not meet the test of homogeneity of variance. Given these findings, it was decided that nonparametric statistics would provide more meaningful information about patient satisfaction and associated variables. Statistical interpretation would be questionable following elaborate data transformation of the study variables. The study hypotheses were modified to reflect the use of nonparametric statistics.

The Spearman rank-order correlation coefficient test was used to explore the relationships between patient satisfaction and the independent ordinal level variables. The point biserial correlation was used to examine the relationship of the dichotomous variable, computer or non-computer collection of patient information, with patient satisfaction.

The results of these analyses using Spearman rank-order correlation are presented in Table 7. Patients who reported higher postoperative pain also indicated higher patient satisfaction ($r_s = .22$, $p = .01$). Though significant, the strength of this relationship ($r_s^2 = .05$) was weak in that

only about 5% of the variance in patient satisfaction scores could be explained by postoperative pain level.

Table 7

Spearman rho correlation of independent and dependent ordinal level variables

r_s	PSI	Age	Staipre	Postpain	Painmang	Preadmit
Age	- .12					
Staipre	- .04	.08				
Postpain	.22*	-.29**	.07			
Painmang	- .10	.10	.00	-.49**		
Presat	- .09	.06	-.00	-.15	.26**	
Numhosp	.01	.52*	.06	-.02	.05	.10

*Correlation is significant at the .05 level (2-tailed)
**Correlation is significant at the .01 level (2-tailed)

In order to get a complete picture of the independent variables, the Spearman rank-order correlation coefficient was used to examine the extent of the associations between the variables. The results of these analyses are presented in Table 7. A significant association was found between postoperative pain and age (r_s = -.29, $p \leq .01$). A significant association was found between age and number of hospitalizations. As age increases the report of postoperative pain decreases. Age explains only 1% (r_s^2 = .01) of the variance in pain. As the age of the patient increases so does the number of hospitalizations. This is an obvious association (r_s = .52, $p \leq$ .05). Twenty-seven percent of the variance (r_s^2 = .27) in number of hospitalizations is explained by age. A significant association is found between postoperative pain and satisfaction with pain management. As postoperative pain increases, satisfaction with pain management decreases (r_s = -.49, $p \leq .01$). Twenty-four percent of the variance (r_s^2 = .24) in satisfaction with pain management is explained by the reported level of postoperative pain. A significant association was found between pre-admission satisfaction and satisfaction with pain management. High pre-admission satisfaction is associated with high satisfaction with pain management

(r_s = .26, $p \leq .01$). Seven percent of the variance (r_s^2 = .07) in reported satisfaction with pain management is explained by a report of high satisfaction with pre-admission. There was almost no association (r = .09), however, between satisfaction following pre-admission and the PSI completed prior to discharge.

The hospital variable indicates a computerized or non-computerized environment. This is a dichotomous variable. As was indicated in the discussion of multiple regression assumptions, the dependent variable patient satisfaction did not present a normal distribution in this study. A point biserial correlation was used to evaluate patient satisfaction in the computerized and non-computerized study hospitals. A significant correlation (r_{pb}=.22, p=.01) was found between patient satisfaction and the computerized Hospital A. The results indicate a positive correlation with 4% of the variance in patient satisfaction explained by the computerized hospital setting.

Hypothesis Number Two

Hypothesis 2 was modified to state: The median anxiety scores reported by the ambulatory surgery patients will increase from the preoperative period to the postoperative period. The results of the Wilcoxon signed ranks test presented in Table 8 indicate that reported anxiety scores did not significantly change from preoperative to postoperative period in patients who had ambulatory surgery. Scores indicate, in fact, that anxiety scores decreased between the two measurement periods. Therefore the Hypothesis 2 was not supported.

Table 8

Comparison of pre-admission reported anxiety to postoperative reported anxiety

Anxiety Scores	N	Mean Rank	Wilcoxon signed ranks *W*	p
Pre-admission	128	65.45		
Postoperative	128	52.88	-.76	.45

Due to the change in the statistical test, the study hypothesis was modified, for initially it was stated as: There is a significant difference between the anxiety level at the time of discharge, controlling for pre-admission anxiety, of patients in computerized and non-computerized

environments. Utilization of the statistical procedure analysis of covariance (ANCOVA) was initially planned to make a comparison between the anxiety level at discharge in the computerized and non-computerized environment. The assumptions for the use of ANCOVA are random selection of subjects, a normally distributed dependent variable, and homogeneity of variance among the groups. If the number of subjects in the groups is equal ANCOVA is robust to the violation of the last two assumptions (Polit, 1996). As in the earlier discussion of assumptions for multiple regression, the dependent variable of this analysis, report of anxiety, is not normally distributed. The subjects in the study groups are also not equal. Data on pre-admission reported anxiety and postoperative reported anxiety are drawn from a related sample. The Wilcoxon signed ranks test was used to compare differences between pre-admission reported anxiety and postoperative reported anxiety in the entire group.

Hypothesis Number Three

A third hypothesis was written to further the study of anxiety in the ambulatory surgery population. Hypothesis three states: Patient's median pre-admission and postoperative reported anxiety scores will be higher in Hospital A (computerized) than Hospital B (non-computerized).

The results of the Mann-Whitney U test, presented in Table 9, indicate that pre-admission and postoperative reports of anxiety in Hospital A were not significantly different than the reported anxiety scores at Hospital B. Hypothesis 3 was not supported by the results of this study. In summary, the Wilcoxon signed ranks and Mann-Whitney *U* tests utilized to address Hypotheses 2

Table 9

Comparison of reported anxiety scores in Hospital A and Hospital B

	Hospital A		Hospital B		Mann-Whitney *U*	
	N	Mean Rank	N	Mean Rank	z	p
Pre-admission anxiety	62	65.10	68	63.93	.37	.86
Postoperative anxiety	62	62.37	68	68.35	-.91	.37

and 3 indicate that there was not a significant difference ($p \leq .05$) between the reported anxiety level between the study groups or within the study groups from pre-admission to discharge. While the mean rank anxiety scores decreased from preoperative to postoperative measurement in Hospital A, they increased in Hospital B.

Hypothesis Number Four

Hypothesis 4 states: Patients with less perceived pain at the time of discharge will rate their satisfaction with pain management higher. The Spearman rank-order correlation test was utilized. The negative correlation between the postoperative pain and the patient satisfaction with pain management was significant, ($r_s = -.49$, $p \leq .00$). Hypothesis 4 was supported by the results of this study. The results for the 130 patients suggest that if patients have more postoperative pain they will rate their satisfaction with pain management lower. Twenty-four percent of the variance ($r_s^2 = .24$) in satisfaction with pain management was explained by the level of postoperative pain.

Reliability of the Instruments

The state measure of the State-Trait Anxiety Inventory (STAI) (Spielberger, 1983) was used to measure pre-admission and postoperative anxiety in this study. On the 20-item scale (N = 128), the pre-admission sample coefficient alpha was .92. With the postoperative sample (N = 130), the coefficient alpha was .91.

The Patient Satisfaction Instrument (PSI) (Risser, 1975) was used to measure patient satisfaction in this study. The changed items from the scale as used by Hinshaw and Atwood (1982) were questions 2, 9, 10, 11, 12, 13, and 25 – 30 (see Appendix E). These changes were made to shorten and or clarify the items. The items were modified to be applicable to the ambulatory surgery setting.

Two items containing the word computer were added. This instrument was modified to contain 30 items for testing with the study sample. The alpha coefficient for this version of the scale was .86. Based on the presented item-total correlation's shown in Table 10, the modified

PSI, that was administered to study participants, was further modified to be a 15-question scale (see Table 11). The alpha coefficient for the remodified scale was .92.

Table 10

Item-total statistics for the patient satisfaction instrument (N = 118)

Question	Corrected Item-Total Correlation	Alpha if Item Deleted	Question	Corrected Item-Total Correlation	Alpha if Item Deleted
1	.30	.8618	16	.62	.8538
2	.24	.8632	17	.43	.8589
3	.48	.8564	18	.57	.8551
4	.53	.8548	19	.21	.8629
5	.23	.8634	20	.19	.8632
6	.48	.8567	21	.07	.8674
7	.48	.8566	22	.56	.8539
8	.28	.8648	23	.14	.8649
9	.40	.8591	24	.55	.8540
10	.59	.8529	25	.64	.8522
11	.51	.8556	26	.50	.8568
12	.44	.8580	27	.61	.8528
13	.22	.8627	28	.15	.8637
14	.13	.8640	29	.14	.8648
15	.55	.8540	30	.13	.8639

Table 11

Item-total statistics for the remodified patient satisfaction instrument (N = 122)

Question	Corrected Item-Total Correlation	Alpha If Item Deleted
3	.64	.9141
4	.66	.9131
6	.62	.9148
7	.54	.9168
10	.72	.9111
11	.66	.9130
15	.66	.9133
16	.68	.9132
17	.43	.9195
18	.63	.9147
22	.64	.9140
24	.69	.9121
25	.71	.9116
26	.57	.9160
27	.62	.9144

The 15 remaining items from the modified Patient Satisfaction Instrument were analyzed with a sample of 122 patients using the principal components method of factor extraction. Using all eigenvalues greater than 1, three factors that accounted for 65% of the variance were extracted. The factors were orthogonally rotated using the varimax procedure, and the results are presented in Table 12.

The first factor that accounted for 47.7% of the variance had 8 items with loadings above .40. This factor seems to reflect effective nurse-patient communication. Examples of items include: the nurse always gives complete enough explanations; the nurse gives good advice; and the nurse really knows what he/she is talking about. Question 7 "The nurse explains things in simple language" also had loadings above .40 on another factor. The item loading had a difference greater than .15 which would indicate its fit with Factor 1 (Kerns, Turk, & Rudy, 1985). It also fits conceptually into effective communication.

Table 12

Rotated factor matrix for principal components analysis of the patient satisfaction instrument (N = 122)

Questions	Factors		
	Effective Communication	Responsiveness	Availability
25	.77		
16	.73		
17	.69		
26	.69		
18	.63		
7	.61		.48
27	.56		
10		.84	
24		.80	
11		.79	
15		.61	
6		.49	.48
4			.81
3		.44	.78
22	.55		.61
Eigenvalue	7.15	1.55	1.05
% of Variance explained	47.673	10.348	7.01

Factor 2 had 5 items, 1 of which also loaded (.48) on factor 3. The difference on item 6 between the loading on factor 2 and 3 was less than .15. Factor 2 was conceptually labeled "responsiveness to problems and needs". This factor involves the nurse's ability to listen, understand and help solve problems. It was decided conceptually that item 6, "the nurse is a person who can understand how I feel", fits under responsiveness. Factor 2 accounts for a variance of 10%. Factor 3 had 3 items with distinct loadings, 1 item at .81. This factor accounts for 7% of the variance. These items were labeled "availability" since they included the nurse's being pleasant, responding invitingly and being easy to talk to.

Further data collected on patient satisfaction included a 1-item satisfaction rating, a horizontal, modified, visual analog scale on the Pain Questionnaire, allowing the patient a rating of 0 to 10. The statement above the scale was, "Rate your overall satisfaction with the nursing care during your hospitalization". Scaled patient satisfaction for the entire group had a mean result of 8.89 (SD = 1.23). The patients in Hospital A reported a mean scaled satisfaction score of 9.13 (sd = 1.31). Hospital B patients reported a mean scaled satisfaction score of 8.68 (sd = 1.11). A Spearman rank-order correlation coefficient test was used to find the association of patient scaled satisfaction on a 1-item question to the PSI score. This was intended to provide an estimate of concurrent validity for the PSI. The results of this analysis (r_s = .58, p = .00) indicated that patient scaled satisfaction was moderately associated with the PSI score.

Summary

Chapter IV presents the process and product of data analysis. The description of the sample contains information on the patient sample and nurse sample of two ambulatory surgical practice settings. Nonparametric statistics were used in comparing the two samples. Statistically significant differences were found in the age, diagnosis and computer use of the patient sample. The nurses were described to explain some possible extraneous variables in the two settings. Significant differences were found in the nurse samples in nursing satisfaction and use of home computers.

The process of data analysis began with a discussion of normal distribution of study variables. Some study variables, including patient satisfaction, were not normally distributed. Various data transformations were attempted and results described with histograms. When the data transformations were found not to be successful, equivalent nonparametric tests were selected to address the study hypotheses, which also had to be altered slightly. Some interesting, statistically significant correlations were found which relate to Hypothesis 1. The hospital setting and postoperative pain correlated significantly with patient satisfaction. The research Hypotheses 2 and 3 were not supported. The hospital setting had no significant relationship with pre-admission and postoperative reported anxiety. Postoperative pain and satisfaction with pain management correlate significantly to support Hypothesis 4.

CHAPTER V

SUMMARY OF THE STUDY

The major purpose of this descriptive correlational study was to explore the relationships of selected variables with the satisfaction of patients admitted to the hospital for ambulatory surgery. These selected variables were collection of patient information by the nurse via computer, the patient's preoperative anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following pre-admission and demographic variables (age, number of previous hospitalization and computer use). Four hypotheses were proposed and analyzed using nonparametric statistical tests. The first hypothesis states, patient satisfaction is significantly associated with the following variables: collection of patient information by the nurse via computer, the patient's preoperative anxiety, postoperative pain, satisfaction with pain management, patient satisfaction following pre-admission and demographic variables (age, number of previous hospitalizations, and computer use). The Spearman rank-order correlation coefficient results suggested that postoperative pain has a significant relationship with patient satisfaction. The result indicated that 5% of the variance in patient satisfaction is explained by the level of postoperative pain. The results of the point biserial correlation indicated that a significant correlation exists between patient satisfaction and the computerized Hospital A. The result indicates that 4% of the variance in patient satisfaction is explained by the computerized hospital setting.

The second hypothesis states that the median anxiety scores reported by the ambulatory surgery patients will increase from the preoperative to postoperative period for the total sample. The results of a Wilcoxon signed ranks test failed to support this research hypothesis, thus there was no significant change in anxiety from pre-admission to discharge. The third hypothesis

states, patient's median pre-admission and postoperative reported anxiety scores will be higher in Hospital A (computerized) than Hospital B (non-computerized). Results of the Mann-Whitney *U* test failed to support Hypothesis 3. The fourth hypothesis states that patients with less perceived pain at the time of discharge would demonstrate higher ratings of satisfaction with pain management. The fourth hypothesis was supported by the results of a Spearman rank-order correlation coefficient test. This chapter summarizes and discusses the findings of the study. Additional findings include the reliability (i.e., internal consistency), concurrent validity, and construct validity estimation of the PSI. In addition to those findings specifically related to the hypotheses, some further exploration of data was performed and reported. Conclusions, implications, and recommendations are presented for future studies.

Summary of Findings

A correlational descriptive study design was used to examine the association between a set of variables and patient satisfaction. The conceptual framework of the study was based on the General Systems Theory (1966). The State-Trait Anxiety Inventory (STAI)(Spielberger, 1983), Patient Data Form (PDF), Nurse Demographic Data Form (NDDF), Pain Questionnaire (PQ) and the Patient Satisfaction Instrument (PSI)(Hinshaw & Atwood, 1982)(Risser, 1975) were used for data collection. Each subject completed the PDF and the STAI during the pre-admission procedure. Postoperatively, before discharge, participants completed the PQ, STAI and PSI. The nurses in the ambulatory surgery department completed the NDDF.

One hundred and forty-nine ambulatory surgical patients participated in the study and the data were collected over a 2-month period. One hundred and thirty of these completed the postoperative questionnaires. Reasons that some did not complete the study included surgery cancellation, rescheduling, and incomplete questionnaires. The study setting included two private hospitals. In Hospital A, the computerized setting, the sample consisted of 62 patients. In Hospital B, the non-computerized setting, the sample consisted of 68 patients. Of the patients who chose

not to participate when approached at the time of pre-admission, most stated that they did not have time to complete the questionnaire due to work schedules.

Although 130 preoperative and postoperative matched surveys were analyzed, not all respondents completed all the questions and thus the total number of data points did not always equal 130. Several subjects did not complete the PSI, leaving 1 to 4 questions unanswered. Two subjects did not respond to one question on the STAI. Diagnosis was omitted by 2, number of hospitalizations by 11, and computer use by 3 respondents. Surveys with missing values were excluded from data analysis.

The Statistical Packages for the Social Sciences (SPSS) computer software was used to enter and store the data set and statistically analyze the responses from the questionnaires. Frequencies, percentages, measures of central tendency, and chi-square tests were used to analyze the demographic data. The patient sample from the two study hospitals was found to vary significantly in age, diagnosis, and computer use. The nurse sample from the two study hospitals was found to vary significantly in relation to nursing satisfaction and home computers.

The patient satisfaction variable (i.e., the intended dependent variable) was found to have a negatively skewed distribution and did not meet the requirements of normality. Data transformation on this variable was unsuccessful. The four most common data transformations presented negatively skewed non-normal distributions. The decision was then made to use nonparametric statistical tests that did not require the same assumptions. Spearman rank-order correlation coefficients, point biserial correlations, Mann-Whitney *U* tests, and Wilcoxon signed ranks were performed on the data. Based on a data reduction procedure using Cronbach's alpha and principal components, the PSI was modified for use in this study. Reliability analysis yielded an alpha of .92 for the modified PSI. Three factors were extracted and named. The pre-admission STAI alpha was .92, and the postoperative STAI alpha was .91.

Discussion of the Findings

Demographic Data Differences

Analysis of the demographic data revealed both similarities and differences in the patient samples from the two hospitals. Hospital A, the computerized hospital, included more patients admitted for orthopedic surgery, while Hospital B included more GI procedures and heart catheterizations. Similarities of the patients in both settings included ear, nose, throat (ENT), abdominal and obstetrical/gynecology (ob/gyn) surgery. Significant differences in the patient groups by hospital were computer use and age. The younger population in Hospital A had a significantly higher computer use. The computerized environment contained a younger population that presented with significantly higher patient satisfaction. This finding suggests that the computerized patient environment in ambulatory surgery is not a deterrent to quality patient care.

The significant difference in nursing satisfaction ratings between nurses in the two hospitals is noted. The results of the chi-square statistic of nursing satisfaction in the study hospitals indicate that nurse satisfaction in Hospital B is significantly higher ($p \leq .01$) than in Hospital A. Patient satisfaction is not significantly associated with nurse satisfaction. One other important extraneous factor to consider is that Hospital B was in the process of moving to a new facility. This move was to happen within 4 months of the time of the study. All the nursing staff in Hospital B would be moving to a newly built state-of-the-art hospital. This may have intervened with nurse satisfaction positively and patient satisfaction negatively.

Patient Satisfaction : A Skewed Distribution

The initial examination of data to determine whether they met the assumptions of normal distribution, homogeneity of variance and independence of observations for performing such parametric tests as multiple regression revealed that there were issues of normality. Patient satisfaction is a highly utilized indicator of the quality of patient care. As a gauge of the quality of nursing care, it has a number of desirable attributes. It tends to produce a negatively skewed distribution similar to the results of this study. That is, patients generally say they are satisfied,

and this satisfaction may exist regardless of the quality of care. The major difficulties in using self-report measures are that subjects may answer the questions to please the investigator and to make a positive impression. Patients traditionally report high levels of satisfaction with nursing, potentially limiting the variation in responses necessary to identify quality problems (ANA, 1995). Patients either do not like to complain or they do not wish to explain their feelings. There is concern as to whether patients really have the technical knowledge necessary to evaluate the quality of care they receive (Cottrell & Grubbs, 1994; LaRochelle & Pesto, 1989). One questions whether the items on a patient satisfaction instrument fail to elicit honest responses or whether the instruments are unable to discriminate. The negatively skewed distribution is a good thing for the evaluation of new health care delivery systems. It invariably gives a gold star to the newly implemented management method (Cone, McGovern, Barnard, & Riegel, 1995; Hinshaw & Atwood, 1982; Munro, Jacobsen, & Brooten, 1994). Although patient satisfaction provides valuable insights, it is not clear that it actually reflects quality of care (ANA, 1995).

Not only does patient satisfaction produce a skewed distribution but health care researchers are unaware, unable, or unwilling to deal with the statistical manipulation required to work with that distribution. Reporting of assessment of assumptions and their violations does not appear to be a common practice in health care research. Less than 20% of 238 randomly selected nursing research articles reviewed included even a brief discussion of the assumptions underlying the use of the reported statistical tests (Pett, 1997). Discussion of the formal testing of the assumptions underlying the statistical tests, management of violations of these assumptions and handling of extreme data were also uncommon (Pett, 1997).

The conclusion may follow that the reason for use of patient satisfaction as an outcome measure must be very clear. The objectives for using patient satisfaction must be presented in the study plan and the results presented within that context, paying attention to data distribution. Patient satisfaction has been defined as a judgment made by the patient concerning the perceived quality of health care. Assessing patient satisfaction with health care is ethically and

pragmatically important (Donabedian, 1988). Patients' opinions are important. Discrepancies between the quality of services health care providers think they provide and patients' perceptions of those services must be evaluated in order for positive changes and improvements to occur. Only patients can evaluate the less tangible aspects of care such as whether they were treated with respect (LaRochelle & Pesto, 1989).

Meaning of Patient Satisfaction

Another problem related to the appropriate use of patient satisfaction as a measure of quality is its construct validity. The Risser Patient Satisfaction Scale is a widely used instrument that has been adapted for use in different settings. There have been variations in the number of dimensions underlying patient satisfaction and in the labeling of those dimensions. Due to lack of independence of previously theorized dimensions, Marsh (1999) suggested a single, theoretical concept. Four subscales, technical competence, information giving, discharge teaching and psychological safety, were extracted in a study of patient satisfaction in the emergency department (Raper, 1996). Satisfaction with the nurse was broken down into personality, care and proficiency in the patient-driven, service industry (Greeneich, 1993). Original work by Donabedian (1988) suggests two domains, technical and interpersonal. Considerable overlap of two factors, interpersonal support and good impression, was found in a study of hospital discharge (Munro et al., 1994). This study found and named three concepts of patient satisfaction: effective communication, problem solving, and availability. Varying concepts are found within the construct of patient satisfaction. Although measurement of patient satisfaction is necessary, a standardized tool needs to be further developed and refined in order to build on the present conceptual knowledge.

The principal components analysis in this study suggests that the negatively worded items on the PSI do not measure the same dimension as the positively worded items. This finding is supported in a study of satisfaction with heterogeneous and homogeneous populations (Mancuso, 1993). In Mancuso's study, three factors were extracted and named: dissatisfaction,

satisfaction and mixed factor. Satisfaction and dissatisfaction were found to be orthogonal concepts. Although the PSI was modified to have 54-items in the study, the negatively worded items loaded on the factor labeled dissatisfaction.

It is interesting to consider the estimation of concurrent validity in this study. A modified, horizontal visual analog scale (VAS) with verbal descriptors at each end and at midpoint (0=not at all, 5=moderately satisfied, and 10=extremely satisfied) was used to measure the individual's perception of patient satisfaction, along with the PSI. The instructions asked the person to "rate your overall satisfaction with the nursing care during your hospitalization". The estimation of concurrent validity was moderate (r_s = .58). The VAS patient satisfaction scale explained 34% of the variance in the PSI. A single-item indicator of patient satisfaction saves time and resources for the patient and researcher, thus the use of single-item indicators for measuring perception may be appropriate (Youngblut and Casper, 1993). In the case of measuring the perception of patient satisfaction with a VAS, the patient is allowed to make a judgement about the meaning of the construct.

Patient Satisfaction and Postoperative Pain

Postoperative pain was indicated on the PQ by the patient marking on a modified, horizontal VAS, from 0 to 10. Above the line was the instruction to "rate the level of your pain". The line had "no pain" under the 0, "moderate pain" at midpoint, and "worst possible pain" under 10. The results of a Spearman rank-order correlation coefficient indicated a significant correlation between postoperative pain and patient satisfaction. The significant result (r_s = .22, p = .01) indicated that those patients who report higher postoperative pain also indicated higher patient satisfaction. The strength of this relationship (r_s^2 = .05) was weak in that only 5% of the variance in patient satisfaction scores could be explained by postoperative pain level. This finding is not supported in the American Nurses Association Report Card. Acute pain has been shown to adversely affect patient outcomes. Researchers have found that hospitalized patients whose acute pain is well controlled are more satisfied with their care than patients whose pain is

unmanaged (ANA, 1995). The findings also disagree with those reported by Jamison et. al., (1997), that lower postoperative pain ratings were the best predictor of satisfaction.

Patient satisfaction is a negatively skewed distribution, and patients may report high levels of satisfaction to please the nurse or researcher. Research has shown that patients complained of moderate or severe pain and considered their pain relief was adequate. Pain relief provided by patient controlled analgesia did not reveal a significant difference in terms of patient satisfaction (Koh & Thomas, 1994). This study confirms the finding that a significant subject group will report high patient satisfaction even when experiencing postoperative pain. This significant finding might also suggest that those who experience more postoperative pain have a greater interaction with the nurse, which leads to higher patient satisfaction.

The PQ does not assess control of postoperative pain. The next question "rate your satisfaction with pain management following surgery" does not ask about control. It is a self-report of satisfaction. A significant association is found between postoperative pain and satisfaction with pain management. As postoperative pain increases, satisfaction with pain management decreases (r_s = -.49, $p \leq .01$). Of the variance in satisfaction with pain management (r_s^2 = .24) 24% is explained by the reported level of postoperative pain The question on postoperative pain was not specified to ask if the patient continued to experience pain.

A significant association was found between postoperative pain and age (r_s = -.29, $p \leq .01$). As age increases the report of postoperative pain decreases. Age explains only 8% (r_s^2 = .08) of the variance in pain. A small significant group of young patients are likely to report postoperative pain. This significant finding is supported by the research of Koh and Thomas (1994) that older people experience effective relief for longer periods than a younger group.

Postoperative Pain and Satisfaction with Pain Management

Hypothesis 4 states that patients with less perceived pain at the time of discharge will demonstrate higher ratings of satisfaction with pain management. The Spearman rank-order correlation coefficient result supports this hypothesis. The findings indicate there is a significant

relationship (r_s = -.49, $p \leq .01$). This result supported the hypothesis; 24% of the variance in satisfaction with pain management is explained by the level of postoperative pain. Support of this hypothesis is somewhat different than the finding that lower postoperative pain ratings were the best predictors of overall patient satisfaction (Jamison et al., 1997); but it does demonstrate that lower pain ratings are related to the satisfaction with pain management. The finding that a significant rise in patient satisfaction resulted after improving the consistency of assessment and management of pain as perceived by the patient is also supported (Tousignant, 1999).

The conclusion seems to be contradicted by the results of Hypothesis 1 where higher postoperative pain had a small significant correlation with higher patient satisfaction. Reflecting on the JCAHO standards, the best explanation for the result seems to be that postoperative pain is assessed and managed in such a way in the study hospitals that patients report higher levels of satisfaction. Since the time of possible contact with a nurse (i.e., approximately 1 to 2 hours) is so short for the ambulatory surgery patient, the patient who experienced more pain during this time was likely to have more contact with the nurse. Issues related to possible inherent problems in the self-report and measurement of patient satisfaction and satisfaction with pain management also provide a possible explanation for this finding.

Patient Satisfaction with Collection of Patient Data by Computer

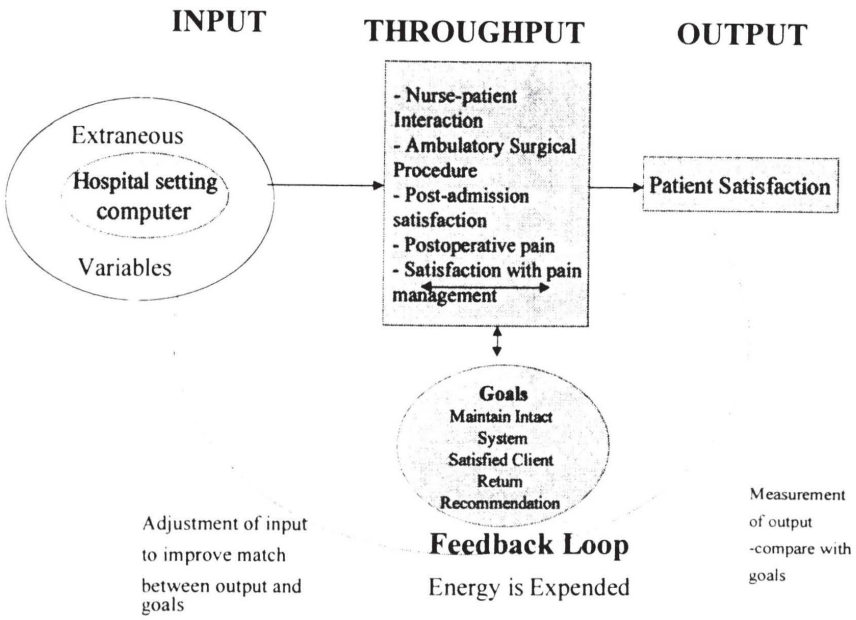
The results of the point biserial correlation indicate that patient satisfaction is significantly correlated with the Hospital A setting. The patient satisfaction in Hospital A is higher than the patient satisfaction in Hospital B. These findings appear to question the philosophical stance of Gadow (1984), Zwolski, (1989), Cooper (1993) and Sandelowski (1988) that computerization of the hospital environment interferes with patient care. Happ (1993) also found that patients who did not have point of care technology (PCT) were more satisfied than patients in rooms with PCT. The findings of this current study may reflect the growing acceptance of computers in all aspects of life.

Reported Anxiety and Hospital Setting

There was no significant change in reported anxiety scores from pre-admission to the postoperative period, and there was no significant difference in the median reported anxiety score in the computerized or non-computerized environments. While these results do not support the research of Decker (1979) and Walding (1991) who found the hospital environment heightened a patient's anxiety, the findings of the current study do at least suggest that reported anxiety may play a role in satisfaction. In looking at the mean rank scores of the two hospitals, the Hospital A sample that demonstrated the highest level of patient satisfaction also showed a decrease in reported patient anxiety from pre-admission to the postoperative period. Anxiety increased for the Hospital B sample. Preoperative information was found to have an effect on anxiety that was not supported by this research (Callaghan, Wheung, Yao & Chan, 1998). The results did support the research of Walker and Konia-Griffin (1997) who found no change in anxiety scores of women on varying routines of prenatal care visits.

Theoretical Framework Revised

The input variable found to be significant in this study was collection of patient information by the nurse via computer. In Figure 4, this variable has been surrounded by extraneous variables, acknowledging that other factors are present in the ambulatory surgical setting. It is possible that other variables (e.g. documentation, staffing for patient care, preparation of patient care protocols, process and content of preoperative teaching, and coordination of nursing services with other hospital departments) have as much influence on the throughput as does computerization. The importance of nursing attention to the level of pain and pain control presents as a valuable part of throughput in the ambulatory surgical setting. The exact role of the pain experienced and how it interfaces with the nurse-patient interaction is unclear. The output variable, patient satisfaction, continues to be an important indicator of the quality of care as perceived by the patient in the ambulatory surgical setting. Measurement methods may need improvement, but the need to ask the questions remains.



(adapted from Mason & Attree, 1997)

Figure 4. A revised theoretical model of ambulatory surgical patient satisfaction

Conclusions and Implications

In conclusion, a significant finding of this study was that postoperative pain is associated with patient satisfaction in the ambulatory surgical setting. Postoperative pain is significantly associated with pain management satisfaction. Postoperative pain and its management are important quality care considerations with the ambulatory surgical population. Although the measurement of pain and satisfaction may need refinement, their assessment is obviously an important consideration for nursing and the judgment of nursing quality. This conclusion is supported in the Nursing Report Card for Acute Care. The ANA recommends the measurement of patient satisfaction as one of five indicators in a core set for nursing quality assessment (ANA, 1995). Implications of this study are that care needs to be taken in surveying pain. The visual analog scale is an acceptable manner of assessing pain intensity, though understanding and

measuring the broader experience of pain and its management requires a standardized instrument.

Computerization in the hospital setting may have a relationship to patient satisfaction. It is naïve to conclude that it is the only or even the most important difference in the two study hospitals. It is one difference, however, that may contribute to variance in patient satisfaction. The implications for nursing are to move into the twenty-first century on-line. Patients expect the hospital, like any other business, to have instant access to data. Nurses need to become computer literate and continuously improve their skills in computer use. The results of this study suggest that the growth of hospital information systems is accepted and expected by the patient population.

Recommendations for Further Studies

Based on the findings of this study, further research is recommended in these areas.

1. The study should be expanded using a longitudinal approach with measurement of patient satisfaction at one month following discharge.
2. Replication of the study should take place in a greater number (such as the new Hospital B) of hospitals. Intention to return to hospital should be added as another indicator of patient satisfaction.
3. Whether satisfaction and dissatisfaction may represent two constructs as opposed to representing two ends of a satisfaction continuum needs to be explored in a future study.
4. Continue refinement of the Patient Satisfaction Instrument with attention to its underlying dimensions is needed. A better understanding of this construct would make measurement of this variable more meaningful in outcome studies.
5. Refinement of the measure of satisfaction with pain management is needed.
6. When better instruments are available, there is a need to investigate the elements in the hospital setting that cause a variance in patient satisfaction, while controlling for

extraneous variables. Future study might include additional measures of quality related to variables of interest, since quality seems to be perceived differently than satisfaction.

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APPENDICES

APPENDIX A

Human Subjects Review Committee Approval

[redacted]

TEXAS WOMAN'S
UNIVERSITY
DENTON/DALLAS/HOUSTON

HUMAN SUBJECTS
REVIEW COMMITTEE
P.O. Box 425619
Denton, TX 76204-5619
Phone: 940/898-3377
Fax: 940/898-3416

April 23, 1999

Ms. Elaine Yellen
422 Northridge St.
Denton, TX 76201

Dear Ms. Yellen:

[redacted]

Your study entitled "Prediction of Patient Satisfaction Following an Ambulatory Surgical Admission" has been reviewed by a committee of the Human Subjects Review Committee and appears to meet our requirements in regard to protection of individuals' rights.

If applicable, agency approval letters obtained should be submitted to the HSRC upon receipt. **The signed consent forms and an annual/final report (attached) are to be filed with the Human Subjects Review Committee at the completion of the study.**

This approval is valid one year from the date of this letter. Furthermore, according to HHS regulations, another review by the Committee is required if your project changes. If you have any questions, please feel free to call the Human Subjects Review Committee at the phone number listed above.

Sincerely,

Jerry D Wilkerson

Chair
Human Subjects Review Committee

cc. Graduate School
Dr. Gail Davis, College of Nursing
Dr. Carolyn Gunning, College of Nursing

APPENDIX B

Agency Permissions

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
AGENCY PERMISSION FOR CONDUCTING STUDY*

THE DENTON REGIONAL MEDICAL CENTER

GRANTS TO Elaine A. Yellen
a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

PREDICTION OF PATIENT SATISFACTION FOLLOWING AN AMBULATORY SURGICAL ADMISSION

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed,
4. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.
5. This permission is contingent upon approval of the study by the Human Subjects Review Board of Texas Woman's University.

Date: 4-9-99

Janice Jennings Chief Nursing Officer
Signature of Agency Personnel

Elaine Yellen
Signature of Student

Geri C. Dair
Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows:
Original – Student; First copy – Agency, Second copy – TWU College of Nursing*

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
AGENCY PERMISSION FOR CONDUCTING STUDY*

THE MEDICAL CENTER OF LEWISVILLE

GRANTS TO Elaine A. Yellen
a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

PREDICTION OF PATIENT SATISFACTION FOLLOWING AN AMBULATORY SURGICAL ADMISSION

The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed,
3. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.
5. Other _____

Date: 3-29-99

Kathryn Lyon RN Chief Nursing Officer
Signature of Agency Personnel

Elaine A Yellen
Signature of Student

Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows:
Original – Student; First copy – Agency, Second copy – TWU College of Nursing.*

APPENDIX C

Permission to use State Trait Anxiety Inventory (Spielberger, 1982)

State-Trait Anxiety Inventory for Adults

Self-Evaluation Questionnaire

STAI Form Y-1 and Form Y-2

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Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

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APPENDIX D

Permission to use Patient Satisfaction Inventory (Risser, 1975)

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ELAINE YELLEN
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Spec Mat: 1975;24(1):45-52 Risser Patient Satisfaction Scale

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APPENDIX E

Patient Satisfaction Inventory (Risser, 1975)

Patient's Satisfaction Instrument Date _____
ID # _____

Please give your honest opinion for each statement on this list by circling the appropriate number to the right of the statement.

		NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	The nurse should be more attentive.	1	2	3	4
2.	Too often the nurse doesn't bother to explain	1	2	3	4
3.	The nurse is pleasant to be around	1	2	3	4
4.	A person feels free to ask the nurse questions	1	2	3	4
5.	The nurse should be more friendly	1	2	3	4
6.	The nurse is a person who can understand how I feel	1	2	3	4
7.	The nurse explains things in simple language	1	2	3	4
8.	The nurse asks a lot of questions that I have answered before	1	2	3	4
9.	The nurse doesn't do anything about the things I tell her/him	1	2	3	4
10.	When I need to talk to someone, I will talk to the nurse	1	2	3	4
11.	I will tell the nurse my problems	1	2	3	4
12.	The nurse is too busy to spend time talking to me	1	2	3	4
13.	The nurse is busy typing on the computer	1	2	3	4
14.	The nurse is often too disorganized to appear calm	1	2	3	4
15.	The nurse is understanding in listening to a patient's problems	1	2	3	4
16.	The nurse gives good advice	1	2	3	4
17.	The nurse really knows what he/she is talking about	1	2	3	4
18.	It is always easy to understand what the nurse is talking about	1	2	3	4
19.	The nurse is too slow to do things for me	1	2	3	4
20.	The nurse is just not patient enough	1	2	3	4
21.	The nurse is not precise in doing his/her work	1	2	3	4
22.	The nurse gives directions at just the right speed	1	2	3	4
23.	I'm tired of the nurse talking down to me	1	2	3	4
24.	Just talking to the nurse makes me feel better	1	2	3	4
25.	The nurse always gives complete enough explanations	1	2	3	4
26.	The nurse is skillful with procedures	1	2	3	4
27.	The nurse is paying attention to my needs	1	2	3	4
28.	The nurse seems distracted	1	2	3	4
29.	The nurse doesn't look at me	1	2	3	4
30.	The computer makes talking to the nurse difficult	1	2	3	4

APPENDIX F

Patient Data Form

Patient Data

ID # _____ Date _____

Age _____ Sex _____

Admission Diagnosis _____

Surgical Procedure _____

How many times have you been in the hospital? _____

How often do you use a computer (circle your response)

Never About once a week Several times a week Daily

Rate your satisfaction with your ability to share information of concern to you.

0	1	2	3	4	5	6	7	8	9	10
not at all					moderately satisfied					extremely satisfied

Rate your satisfaction with the opportunity to ask questions.

0	1	2	3	4	5	6	7	8	9	10
not at all					moderately satisfied					extremely satisfied

Rate your satisfaction with the information received during preadmission concerning your surgery.

0	1	2	3	4	5	6	7	8	9	10
not at all					moderately satisfied					extremely satisfied

Rate your satisfaction with the way the nurse communicated with you.

0	1	2	3	4	5	6	7	8	9	10
not at all					moderately satisfied					extremely satisfied

Did the nurse use a computer to complete your preadmission? ____yes ____no

Does the computer interfere with your communication with the nurse?

0	1	2	3	4	5	6	7	8	9	10
not at all					moderately interfering					extremely interfering

Rate your satisfaction with your hospital pre-admission?

0	1	2	3	4	5	6	7	8	9	10
Not at all Satisfied					Moderately Satisfied					Extremely Satisfied

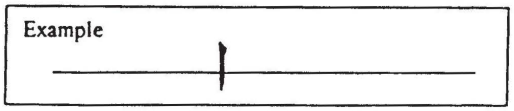
APPENDIX G

Pain Questionnaire

Pain Questionnaire ID # ____ Date _____

Mark on each line.

Example



Rate the current level of your pain

0 1 2 3 4 5 6 7 8 9 10
No pain — Moderate pain — Worst possible pain

Rate your satisfaction with pain management following surgery

0 1 2 3 4 5 6 7 8 9 10
not at all — moderately satisfied — extremely satisfied

Rate your level of pain relief following surgery

0 1 2 3 4 5 6 7 8 9 10
No Relief At all — Moderate Relief — Complete Relief

Rate the nurses' helpfulness with your pain relief following surgery

0 1 2 3 4 5 6 7 8 9 10
Not Helpful — Moderately Helpful — Extremely Helpful

Rate your overall satisfaction with the nursing care during your hospitalization

0 1 2 3 4 5 6 7 8 9 10
not at all — moderately satisfied — extremely satisfied

APPENDIX H

Nurse Demographic Data Form

Nurse Demographic Data

I understand that the return of my completed questionnaire constitutes my informed consent to act as a subject in this research.

Hospital: DRMC ☐ MCL ☐ GMH ☐

How many years have you practiced nursing? _____

How long have you worked at this hospital? _____years _____months

How long have you worked in the outpatient surgery department? ____years ____months

What degree do you have? ADN ☐ BSN ☐ MS ☐ Other (specify):_____

Do you have any other credentials? (Please specify):_____

Do you enjoy nursing? _____yes _____no

Please rate your current satisfaction with your nursing practice (mark on the line):

_____

0 1 2 3 4 5 6 7 8 9 10
not at all — moderately satisfied — extremely satisfied

How long have you used a computer? _____years_____months

Do you have a computer at home? _____yes _____no

Do you have any formal computer education? _____yes _____no

How often do you use a computer? (circle your response)

Not at all | About once a week | Several times a week | Daily

Rate how comfortable are you using a computer? (mark on the line)

_____

0 1 2 3 4 5 6 7 8 9 10
Uncomfortable — Moderately Comfortable — Extremely Comfortable