PREOPERATIVE TEACHING EFFECT UPON
POSTOPERATIVE PAIN PERCEPTION
AND PAIN BEHAVIOR

by
Janice Rae Allen

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STATEMENT BY AUTHOR

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APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

A. S. HINSHAW
Professor of Nursing

Date
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Human adaptation to pain model
ABSTRACT

Perioperative nursing incorporates teaching-learning concepts into the daily activities of nurses practicing in the operating room. This quasi-experimental study was designed to determine whether cognitive, sensory and participatory teaching provided preoperatively by operating room nurses had an effect on the surgical patient's postoperative pain perception with an indirect effect upon the postoperative pain behavior. It was predicted that sensory information would have the greater impact upon the postoperative pain experience. Eight-eight adult subjects participated in the study.

No significant differences were evident, as indicated by t-tests, between the pain experiences of the experimental and control groups. The level of the strength of relationships between the major variables of the study and the degree of influence the teaching activities had upon pain perception and pain behavior were found to be not significant.

The prediction made in the study's theoretical framework that the surgical patient who received selective preoperative instruction from an operating room nurse would experience a lesser pain experience was not supported by the
data. There was no evidence found that sensory teaching activities had a greater impact upon the postoperative pain experience than did cognitive or participatory teaching activities.
CHAPTER 1

INTRODUCTION

The recent history of nursing has found nurses in a constant state of flux as the profession attempts to adjust to its changing social role. King (1971) identified the vast expansion of knowledge and increased specialization within the health care system as the creator of specific problems for nursing. These problems appear to center around role definitions and responsibilities.

One of the major criticisms directed against nurses who engage in patient care activities in the operating room was that the primary focus of their practice was upon the technical component of nursing. The recognition of the need for the redirection of nursing practice in the operating room prompted the Association of Operating Room Nurses (AORN) to establish the concept of the perioperative role as the framework for their practice (AORN Journal 1978).

Perioperative nursing incorporated the nursing process into the daily activities of operating room nurses as they engaged in preoperative nursing assessment and planning, intraoperative nursing care delivery and postoperative care evaluation. The perioperative role has merged both technical
and professional components of nursing practice and has enabled the teaching of holistic care to surgical patients (Jordan 1980).

Preoperative visits by operating room nurses was not a new concept. Unstructured patient visits were routinely made nationally by operating room nurses when it was considered a part of their nursing role to accomplish a portion of the patient's physical preparation the evening prior to the operation. Although researchers (Egbert et al. 1964, Collins, Darke and Knowelden 1968) had established the positive effects of preoperative instruction by health care providers upon the surgical patient's postoperative outcomes, Lindeman and Stetzer (1973) were the first to extensively evaluate the effects of structured preoperative visits by operating room nurses. In their research, the effects of visits upon selected aspects of the nursing care provided in the operating room and upon the general welfare of the patient postoperatively were investigated. Interestingly, the researchers concluded that although there was continuity of patient care from the preoperative period through the surgical experience there were no positive results noted postoperatively which would be indicative of the improved continuity of care.

It was the intention of this investigator to study the effects of the teaching activities engaged in by operating
room nurses who function in the perioperative role. The outcomes selected for measurement were the surgical patients' postoperative pain experience, which Cohen (1980) identified as being vulnerable to nursing practices. The pain experience is defined as the experience of surgical pain which included the postoperative pain behavior and postoperative pain perception.

Statement of the Problem

This study was designed to determine whether the different types of information provided surgical patients by operating room nurses preoperatively had an effect upon the patient's perception of their postoperative pain experience. Secondly, did the type of preoperative information provided by operating room nurses to surgical patients indirectly affect the patients' postoperative pain behavior by influencing the pain perception?

Significance of the Problem

Human pain is a universal occurrence which has both a physiological and psychological component. In recent years, scientists have acknowledged and have begun to investigate the emotional aspects of pain (Melzack and Torgerson 1971). The traditional medical means for pain control have been the administration of narcotics which are directed toward the treatment of the physiological component. More
recent practices indicate the acceptance by physicians of the necessity to include in the treatment the emotional component of this phenomenon. Currently, it is not uncommon medical practice to administer an anti-anxiety drug such as Diazepam in conjunction with a narcotic for the pain control of surgical patients (Dubner 1978). Other areas of success in pain control which have been realized by focusing upon the emotional component are in child birth and chronic pain therapy (Siegle 1974).

The functions of the nervous system, which are conduction, secretion and storage of information, cannot be relegated to secondary significance. The transmission and interpretation of the pain stimulus are most important as man maintains homeostasis through adaptation to a changing internal and external environment (Guyton 1976). Yet, pain is a subjective experience which McCaffery defined as being "whatever the experiencing person says it is, existing whenever he says it does" (1979, p. 11).

The patient who experiences surgery is vulnerable to pain as defined in this investigation. The tissue trauma of the operation provides the physiological aspect while the fear and anxiety of the anticipated physical pain and the possible threat to life incorporates the psychological or emotional component (McMahon and Miller 1978, Guyton 1976).
Reports of occurrences of extraordinary behavior by persons who are emotionally challenged are not uncommon. Beecher (1956, 1959) wrote extensively of the high pain tolerance which he noted in the battlefield wounded of the Second World War. The wounded soldiers exhibited a much higher pain tolerance than did elective surgical patients who experienced comparable tissue trauma through operative wounds in civilian hospitals. Beecher concluded that pain intensity is partially determined by factors other than the extent of physiological tissue damage.

It is most appropriate for the nursing profession to focus upon the problem of pain control, for nurses routinely assess, plan, intervene and evaluate nursing actions delivered for patient comfort. Although nurses can not legally prescribe medications (narcotics), they are the health care providers who assess the pain experiences and evaluate whether effective measures for pain control are being prescribed by physicians.

Preventive health care teaching by nurses has increasingly focused upon patient activities which help to prevent the potential complications of postoperative pulmonary hypoventilation and circulatory stasis (Collins et al. 1968). Ineffective pain control has been recognized as a contributing factor for these potential surgical complica-
tions (Diament and Palmer 1966, Knutson 1965). It is imperative that nurses achieve a comprehensive understanding of the pain phenomenon as the profession more actively engages in an expanded role during the 1980's. For far too long, the lack of accountability for pain relief and cultural misconceptions have interfered with the quality of pain control possible with the current state of the art.

**Purpose of the Study**

The purpose of this study was to determine whether surgical patients who received cognitive, sensory and participatory types of information from operating room nurses will perceive less pain and will show decreased pain behavior postoperatively than those surgical patients who receive no preoperative instruction from operating room nurses. The magnitude of the influence of the three types of information upon postoperative pain perception and pain behavior will be described. It was predicted that sensory information will have the greatest effect upon the postoperative pain perception, with an indirect effect upon the postoperative pain behavior.

**Theoretical Framework**

The Human Adaptation to Pain Model which provides the triple-staged, theoretical structure for this study is
depicted in Figure 1. The hieratical arrangement of the modified Gibbs-type paradigm places teaching/learning theory, perception modification theory, and behavior modification theory upon the construct level.

To present the necessary perspective for the recent development of teaching/learning theory, the works of the Russian physiologists Sechenov and Pavlov were considered. Sechenov's 19th century research interests were centered in both psychology and neurophysiology. He believed that learning was based in the nervous system and that it consisted of an association of external stimuli with muscular responses whereby behavior was thought to be reflexive. Pavlov (1927) identified two types of reflexes during animal research. One of these he referred to as the species reflex which he described as being inborn or an unconditional reflex. The second reflex to which Pavlov referred was an acquired or conditional reflex which necessitated reinforcement for its establishment in man or animal. The stimulus response concepts of these early scientists were the basis of the accepted learning theory as it existed during most of the early part of the 20th century (Kazdin 1978, Bigge and Hunt 1968).

Skinner (1953) shifted the emphasis in learning from the respondent or elicited response to the operant or emitted
Figure 1. Human adaptation to pain model.
response. Carpenter (1974) succinctly described Skinner's psychology as that which man experiences through his behavior and the quality of the consequence of his behavior which will influence any future action by that individual. The operant conditioning theory of Skinner has resulted in the development of behavior modification techniques which are frequently used in health care settings (Egbert et al. 1964, Kolouch 1962). Marshall (1978) listed the behavior modification techniques of information and reassurance, hypnosis, systematic relaxation and desensitization as being valuable therapeutic interventions for patients experiencing the stress of hospitalization and surgery.

While the stimulus response advocates were able to equate learning with man's adaptability to his environment (behavior), it was the Gestaltists who established a theoretical basis for teaching/learning theory and perception modification theory. The Gestalt school considered the individual's environment to be primarily psychological and consisting of that which each person makes of his surroundings (Bigge and Hunt 1968). The theory regarded experience as being based in insightful behavior whereby cognitive structuring became the basis for all learning. Wolff (1953) identified the individuality of the learning experience when he stated genetic heritage, social and cultural experiences
and individual personality were factors of perceptual
significance.

In the first stage of the model (Figure 1) the paral­
leled conceptual levels are based upon preoperative teaching
and patient learning with the associated teaching activities.
Janis (1958) wrote of the need for the application of
teaching/learning concepts in the health care setting. He
identified this environment to be perceived as fear-provoking
and life-threatening by many patients. Janis concluded that
the provision of factual information by health care workers
to patients would enable those persons to better confront
the threatening situation by engaging in cognitive struc­
turing.

While Janis considered the level of fear to be the
determinant of adaptation, Johnson and Leventhal (1971)
considered the fear and coping responses of the surgical
patient to be the "product of his cognitive appraisal of
the environmental danger" (p. 56). In their proposed
"parallel response theory" of the adaptive responses to
surgery, Johnson and Leventhal suggested that because the
patient is fearful he may take actions to attempt to influ­
ence his situation through cognitive structuring. These
actions could lead to his seeking information or requesting
medication.
In later research, Johnson and coworkers reported that effectiveness of specific types of information upon patient outcomes. Johnson and Leventhal (1974) studied 48 hospitalized patients who experienced endoscopy examination and to whom either behavioral instruction or sensory information was provided prior to the examination. The sensory information described the specific sensations the subjects would experience during the endoscopy procedure while the behavioral instruction provided specifics of how to act during the procedure to help reduce the procedural discomfort. This double blind study was conducted at the University of Wisconsin Medical Center with subject selection based upon four criteria: no previous endoscopy examination, lack of disorientation, and the subjects were not blind or deaf. Results which were reported stated that the sensory information group received a mean of 6.18 milligrams less of tranquilizer than did the control group. Also, the behavioral instructed group received a mean of 2.92 milligrams less tranquilizer than the control group.

In a laboratory study where 53 male subjects experienced ischemic pain in their arms due to inflated blood pressure cuffs, Johnson and Rice (1974) reported that the subjects did not require complete information to experience positive outcomes. The subjects were 18 to 25 years of age
were recruited through advertisement in a Mid-western student newspaper. The randomly assigned subjects had experienced no recent chronic or acute health problems and they had not served in the armed services. Persons who received a description of only two of the likely five sensations reported a comparable reduction in the mean distress rating as did the group who received full descriptions of the likely sensations. Accuracy of the information provided seemed significant. Those subjects receiving inaccurate information or no sensory information were reported to experience a higher mean distress rating of 23.10 as compared with the mean of 15.15 for the two groups who received accurate but varying amounts of information about the likely sensations.

Later, Johnson and her coworkers (1978) established that the provision of sensory information significantly increased the rate of recovery for 81 randomly assigned, predominantly female patients undergoing cholecystectomy. The mean number of days in the hospital for the sensory information group was 5.53 while the mean number of days in the hospital for the control group was 6.27. With health care providers active as facilitators, the cognitive structuring of information by the surgical patients enables their more rapid recovery from the surgical experience.
Pain perception and pain behavior in the postoperative phase of the surgical patient's care are the dependent variables of this study, as illustrated in Stages 2 and 3 of the model's conceptual levels (Figure 1). As established earlier, the human pain experience is accepted as a physiological and psychological event (Beecher 1956, Guyton 1976). Based upon his extensive research with surgical patients, Beecher concluded that "pain sensations and pain perceptions were identical" (p. 188). Because of the reactive component, he reported there was no constant pain threshold from man to man or from one pain experience to the next painful experience.

Melzack and Torgerson (1971) noted that a limited means for pain evaluation was available for those persons concerned with the study of this phenomenon. The primary measurement tool available consisted of a subjective intensity rating on a numeric scale. Melzack (1975) expanded the subjective dimensions of pain to three categories of descriptive words with the terms based upon the sensory, affective and evaluative qualities of the experience. Sensory qualities included terms of temporal, spatial and thermal properties. Affective qualities dealt with the automatic or emotional properties of the experience while evaluative words were descriptive of the overall subjective pain experience
with no subclass identified. Recognizing that intensity was of importance in pain evaluation, numeric values were applied to each of the qualities thereby enabling the establishing of this relationship to the pain experience.

Egbert et al. (1964) engaged in an extensive preoperative teaching program in which 46 surgical patients having elective intra-abdominal operations were assigned to a special care group. This group was taught breathing and coughing techniques and were provided information and much reassurance by the health care providers. A control group of 51 surgical patients undergoing elective surgery did not receive this special care protocol. Egbert et al. reported that those patients who received instruction required significantly less narcotics. Forty-eight hours after their operations, the special care group received a mean of 13 mgm. of morphine sulfate while the control group received a mean of 28 mgm. of morphine sulfate. Additionally, the special care group was discharged from the hospital two or three days earlier than the control group. Lindeman and Stetzer (1973) reported their findings from a study in which 176 randomly assigned, adult, surgical subjects received or did not receive a preoperative visit from operating room nurses. The setting for this study was a 311-bed community hospital located in central Wisconsin. During the first 48
postoperative hours the experimental group received a mean of 3.05 analgesics; the control group received a mean of 2.61 analgesics. These findings were considered of no significant difference. Johnson et al. (1978) duplicated the findings of Egbert (1964) in their study with 81 randomly assigned patients having cholecystectomies. The patients receiving preoperative instruction received fewer numbers of doses of analgesics postoperative \( (\bar{x} = 5.91) \) than the patients who did not receive the instruction \( (\bar{x} = 7.55) \).

In a comparison study with the 81 randomly assigned patients undergoing cholecystectomies, Johnson et al. (1978) found insignificant evidence that 68 patients having herniorrhaphies benefited postoperatively from the same preoperative interventions. In this study, Johnson identified the length of hospitalization as a significant variable, for in the short term, situational factors such as physician's orders, determine patient's behavior. Johnson reported that surgeon's orders are specific in regard to patient's postoperative physical activity levels, dietary intakes and pain control measures. Johnson believed this especially true for the number of medications received by surgical patients during the first 24 postoperative hours. Egbert et al. (1964) found differences between the number of analgesics received by the experimental and control groups did not appear
until 48 hours postoperative. This study's dependent variable, postoperative pain behavior (Figure 1), was operationalized by the number of times analgesics were administered to the subjects at 48 and 72 hours.

**Definition of Terms**

1. **Teaching Activities/Patient Learning**: information provided by health care workers which was directed toward effecting behavioral change in the area of understanding, performance of psychomotor skills and attitudes by hospitalized adults (Redman 1971).

2. **Preoperative Teaching Activities**: the cognitive, sensory and participatory types of information which were provided the surgical patient by the operating room nurse preoperatively.
   a. **Cognitive information**: the information provided which pertained to the time, place and persons involved and the preparatory activities of the operating procedure, e.g., waiting room location (Johnson and Leventhal 1971).
   b. **Sensory information**: the information provided which pertained to the sights, sounds, smells and feelings associated with operative procedure, e.g., the coolness of the operating room temperature (Johnson et al. 1978).
c. Participatory activities: specific instructions which pertained to the coughing, deep breathing and wound splinting which was verbally taught and demonstrated by the operating room nurse with return demonstration by the patient, e.g., splinting of incision site with clasped hands (Lindeman and Van Aernam 1971).

3. Pain Perception: the reactive component of the pain experience which lacks correlation with the extent of the wound and the degree of pain reported by the subject (Beecher 1956).

4. Postoperative Pain Perception: the subjective interpretation of noxious stimuli as being sensory, affective or evaluative in quality as measured by the McGill Pain Scale.
   a. Sensory terms: flickering, pulsing, beating.
   b. Affective terms: tiring, sickening, fearful, etc.
   c. Evaluative: annoying, miserable, unbearable, etc. (Melzack 1975).

5. Pain Behavior: the individual's response to a multidimensional phenomenon which includes the sensations evoked by tissue damage or a noxious stimulus plus the reaction to that event or sensation (Dubner 1978, Chapman 1977).
6. **Postoperative Pain Behavior**: the number of times analgesics were received postoperatively by the subjects of this study.

7. **Postoperative Pain Experience**: the subjective experience of surgical pain which includes the postoperative pain perception and postoperative pain behavior.
CHAPTER 2

LITERATURE REVIEW

A review of the literature was accomplished for the purpose of presenting information from previously published investigations which related to the effect of patient teaching upon surgical patients postoperative pain experiences. The areas included in the review were pain theory, adult learning concepts, patient education, postoperative pain perception and pain behavior.

Pain Theory

There were two major pain theories found in the literature. The first of the theories to be described is the Specificity Theory which was based upon the stimulus response and stimulus specificity of nerve fibers in the periphery (Jenson 1976). The Specificity Theory stated that nerve fibers or combinations of fibers in the periphery responded to stimuli and the strength of the stimuli determined the predictable response (Dubner 1978, Pearson 1976). The major weakness of the Specificity Theory has been the inability to account for observable clinical pain phenomena such as phantom limb pain which occurred post-limb amputation.
or the failure of the interruption of the course of a peripheral nerve (rhizotomy) to produce pain relief in a chronic pain situation (Pearson 1976). The Specificity Theory has been the primary pain theory in many medical schools for years (Melzack and Taenzer 1977).

The Gate Control Theory of Melzack and Wall (1965) was the more recently proposed pain theory. According to Melzack and Wall, pain impulses were transmitted over small-diameter fibers from the peripheral nervous system to the dorsal columns of the spinal cord. Here the antero-lateral tract of the spinal cord carried the stimulus to the thalamus and the cerebral cortex. The theorists believed that blocking or gating of the stimulus could occur anywhere along the transmission route regardless of the strength of the pain-producing stimulus. The functional unit where blocking or gating occurred is believed to be in the substantia gelatinosa which extends the length of the spinal cord (Melzack and Wall 1965, Pearson 1976). It was suggested that gating could occur from the input of the large-diameter afferent fibers of the peripheral nervous system and from the descending control of the brain stem, thalamus and cerebral cortex (Siegle 1974, Wall 1978, Melzack 1973).

When Wall re-evaluated the Gate Control Theory (1978), he agreed to the validity of the Specificity Theory but
maintained that it remained limited in scope. Wall stated that its applicability was primarily "diagnostic" and not "predictive," for each time a certain strength of stimulus occurred a particular painful event was not an actuality (p. 3). Melzack and Wall believed that the Gate Control Theory could account for the psychological, social and cultural components of the pain experience as well as the physiological happening.

Recent research in biochemistry and physiology has identified a yet-not-fully-understood endogenous pain suppression mechanism within the central nervous system (Greenberg and Palmer 1978, Sweet 1977). Endorphins have been identified which are naturally occurring opiate-like compounds which produce analgesics when the brain of a laboratory animal is electrically stimulated (Basbaum and Fields 1978). The endorphins are thought to be a part of a negative feedback system which limits the animal's perception and behavioral responses to pain-producing stimuli (Greenberg and Palmer 1978). These recent discoveries which are believed to be a part of the body's own defense mechanism have increased research efforts in man's physiological responses to painful stimuli.

**Adult Learning Concepts**

Knowles (1970) stated four assumptions which separate the adult learner from the child learner. Knowles stated
that as the individual moves from the child learner to the role of the adult, he develops a deep need to be perceived as a self-directed, respectable individual. The adult could be "resentful of situations in which he was told what to do or was judged or embarrassed" (p. 39). The experiences which have been accumulated by the adult become a resource for his future learning while his readiness to learn is increasingly tied to the needs of his social roles. According to Knowles, the more immediate the new knowledge can be applied, the more pertinent becomes the problem-centered information which the adult is seeking. These assumptions are based upon the role changes which occur during maturation.

Labouvie-Vief (1980) discussed the hallmark of adulthood as being commitment and responsibility toward the status quo of a social system. He believed that the flexibility of youth enabled an adaptive approach which was necessary for the development of new skills and personal and professional identity.

Since the purpose of learning is to change behavior, Lowe (1975) stated that the teacher must become aware of certain learning concepts before behavioral change could be expected in the adult. Some of the applicable principles for adult learning include:
The freedom to avoid or engage in the learning experience.

The ideas which oppose his beliefs will be rejected.

The authority of the teacher will be determined by competence alone (p. 21).

Patient Education

The need for patient education in the health care setting was reported by Linehan (1966) when 49 percent of the 450 patients interviewed at the time of their discharge from an eastern United States hospital expressed unmet needs for health-related information. Areas in which information was perceived as being lacking included diet, disease prognosis, medications and activity levels. The patients were reported to view the physicians as being evasive and removed from the patients while the nursing staff was believed forbidden to answer their questions due to the nature of their responses. According to Linehan, the nurses usually redirected the patient's questions to the physicians.

Yet Pohl (1965) reported that the majority of 1500 nurses who were polled believed that patient education was a part of their role as a member of the health team. Later, Packard and Van Ess (1969) published a report in which the nurses' effectiveness as teachers was cited. When proper dietary selection was taught by nurses who clarified their
roles as teachers and the patients' roles as learners, there was a 30 percent increase in the selection of proper foods by the instructed patients.

Because patient education had not been readily accepted as an accountable part of nursing practice, Redman (1971) suggested that there was an urgent need for evidence concerning the effectiveness of patient education in economic and human welfare terms. She believed this kind of information would help health care providers establish priorities for professional practice.

Lindeman and Van Aernam (1971) conducted a comparative investigation of the effects of a structured and unstructured preoperative teaching program of coughing, deep breathing and bed exercises upon the postoperative ventilatory functioning, length of hospital stay and need for analgesics. The study population consisted of 261 randomly assigned surgical patients 15 years and older. The clinical study was conducted in a 311-bed Midwestern community hospital. A positive effect between the structured teaching program and the postoperative respiratory function of the experimental patients was reported by the researchers. The experimental group spent a mean of 1.906 fewer days in the hospital while the third measured variable, the number of postoperative analgesics administered during the first 72
postoperative hours, was reported as not being significantly different. The mean number of analgesics administered was .51 less for the control group. The research of Lindeman and Van Aernam was significant, for not only did their findings establish the effectiveness of patient education by nurses but the effectiveness could be expressed in the economic and human welfare terms which Redman had suggested.

Postoperative Pain Perception/Behavior

In clinical practice, it is not uncommon to hear a patient express with uncertainty his ability to cope with the anticipated postoperative pain of a surgical procedure. Barnett (1976) reported that the anticipation of a treatment or procedure which is likely to cause pain can elicit an intense emotional response in hospitalized persons. Wolpe and Lazarus (1966) identified particular behaviors by difficult patients as results of their attempts to control their environment.

The research of Egbert et al. (1964) and Fortin and Kirovac (1976) reported the positive effects of preoperative patient education upon the postoperative pain perceptions and behaviors of surgical patients. Egbert and his coworkers (1964) studied 97 randomly assigned, surgical patients who were scheduled for elective intra-abdominal operations. The
experimental group (n = 46) received special instructions and encouragement from the anesthesiologist preoperatively while the control group received no special care. A double blind field design was used and the researchers reported the experimental group received less milligrams of narcotics (\( \bar{x} = 15 \) mgm. of morphine sulfate) and were discharged from the hospital 2.7 days earlier than the control group. Fortin and Kirovac (1976) reported minimal behavioral differences between the experimental and control groups of a randomly controlled study in Montreal. The 69 adult surgical patients experienced no significant differences in length of hospital stay although the experimental group was reported to receive 140 milligrams less of analgesics during the first 72 postoperative hours.

Johnson (1973) studied the effects of the types of information that can affect an emotional response to a threatening stimulus in a three-part laboratory experiment. Her subjects were young male university students who experienced pain from an inflated blood pressure cuff in a laboratory setting. One group (n = 20) was provided relevant information about the sensations of the experiment while the second group was provided irrelevant information. The mean distress rating of 14.4 during blood pressure cuff inflation was recorded for the relevant information group.
while the irrelevant information group's distress rating was recorded as 21.8. Johnson stated the need for appropriate information seemed to be emphasized by this study, for "only when there was a combination of accurate expectations about sensations and experience with the sensation did a reduction of distress ratings occur" (p. 273).

Johnson and Leventhal (1974) studied 48 randomly assigned patients who experienced tube passage in a clinical setting after receiving varying types of preparatory information. They reported that the persons who had received the sensory descriptive information gagged less (46.2 percent) than 90 percent of the control group, who received no information.

The effects of providing sensory information, procedural information and instruction for postoperative exercise to 81 randomly assigned, adult surgical patients who experienced cholecystectomies were reported by Johnson et al. (1978). The significant findings reported by the researchers were that the instructed patients received a fewer number of analgesic doses ($\bar{x} = 5.91$) than did the patients who received no instruction ($\bar{x} = 7.55$). Although both groups were ambulating after their operations on the day of surgery or on the first postoperative day, the instructed group was reported to ambulate more frequently ($\bar{x} = 10.86$) than did the non-instructed group ($\bar{x} = 8.28$).
In a replication study of the earlier 1978 sensory information study, Johnson et al. (1978) reported the significance of repeated sensory information in the postoperative recovery of 58 patients undergoing cholecystectomies. The patients who received a repeated sensory message were administered a lesser number of analgesic doses ($\bar{x} = 5.11$ and $\bar{x} = 5.05$) than those persons who did not receive the repeated sensory information ($\bar{x} = 5.46$ and $\bar{x} = 9.88$). The preoperative information was reported to reduce the length of postoperative hospitalization for the second-message group who had a mean of 2.98 days compared with a mean of 3.47 days for the one-message group.

Summary

A review of the literature indicated that for many years the pain experience was considered to be a physiological event. When Melzack and Wall (1965) proposed the Gate Control Theory for pain, the little-understood clinical phenomena of phantom pain and hypersensitivities were explicated.

Paralleling the development of a new pain theory was the gradual acceptance by the health care providers that patient education could have a positive effect upon the postoperative recovery of surgical patients. Lindeman's studies (1971, 1973) of the effects of preoperative teaching
upon the patient's postoperative outcomes were of special importance in the role definition of surgical nursing. Her research findings regarding the postoperative respiratory status, ambulation and number of analgesics received by postoperative patients emphasized the positive impact that nursing could effect upon the surgical patient's recovery.

Johnson and her coworkers also have contributed to nursing's knowledge base of patient education. Her research activities (1973, 1974, 1978) have established the significance of sensory types of information which better enable patients to effect control over the threatening situations experienced in health care settings.
CHAPTER 3

METHOD OF THE STUDY

The content presented in this chapter includes the design of the study, operational definitions of variables, criteria for the selection of subjects and the statistical analysis.

Design of the Study

This study consists of a secondary analysis of a portion of a larger data base obtained from the research project, Operational Trajectory Study, by Allen et al. (1978), Hinshaw et al. (1978, 1981) and Gerber et al. (1981). Approval for the study was obtained from the Human Subjects Committee (Appendix A).

The questions asked by this investigator of the larger quasi-experimental study was: do cognitive, sensory, and participatory types of preoperative instruction provided by an operating room nurse affect the postoperative pain experience of surgical patients? It was predicted that sensory teaching activity would have greater impact than the other two types of information upon postoperative pain perception with an indirect effect upon the postoperative pain
behavior. A double blind design was used with the subjects assigned to the experimental and control groups prior to the introduction of the independent variable which was the preoperative instruction provided by operating room nurses. The data were gathered 24 to 72 hours postoperatively by persons who were unaware of the experimental or control grouping of the subjects. In all instances the data collectors explained the nature of the project and obtained the subject's consent (Appendix A) prior to the administration of the questionnaires.

Criteria for the Subjects

The subjects for this study were selected as their names appeared on the operative schedule the day prior to their operations at a Southwestern University hospital. The criteria for selection was:

§ Adults between the ages of 18 and 72 years.
§ Patients who were scheduled for elective abdominal and selective orthopaedic surgical procedures.
§ Malignancy was not suspected as a diagnosis.
§ The patients had not experienced an operative procedure within the past six months.
§ The patients were English-speaking and were literate.

The 88 subjects were assigned to the experimental (n = 54) or control group (n = 34) through a varied selection
process. The design of the original study, the Operative Trajectory Study, required that the experimental group (n = 54) be larger than the control group (n = 34) (Hinshaw et al. 1978). This was considered to be necessary because of the correlational descriptive design which was superimposed on the quasi-experimental group data. This enabled the researchers to estimate the relationship of different types of preoperative teaching activities on the nursing care provided and the patient's postoperative outcomes.

The random assignment of subjects to the experimental or control group was accomplished through the flip of a coin. Those patients who were scheduled for surgery on Mondays were omitted from the study, for preoperative teaching could not be provided to them by the operating room nurses. The nurses who were assigned to provide the patients intraoperative care were scheduled for days off on the weekends. This is a common staffing pattern for operating room nurses.

To achieve the necessary numbers of subjects for study reliability, the decision was made to assign those patients who met the subject criteria for the study to the control group. The random assignment of subjects to the experimental or control group continued during the remainder of the week.
Operational Definitions of Variables

Independent Variable

The independent variable was the teaching activities which were provided the 54 experimental subjects during the preoperative visit by the operating room nurses. The three types of teaching activities delivered were of the cognitive, sensory and participatory nature. The cognitive information was based upon the activities which pertained to the time, place, persons involved and the immediate preparatory nursing activities for the operative procedures. The anticipated sights, sounds, smells and feelings associated with the operative preparation and the procedures were of the sensory types of information provided the experimental subjects. The participatory activities consisted of specific instruction and demonstration of coughing, deep breathing and wound splinting by the operating room nurses with return demonstration by the subjects.

The independent variable was operationalized through a teaching activity checklist which was adapted from the work of Johnson (1973) and Linderman and Stetzer (1973) by Hinshaw in 1977 (Appendix B). The tool was formulated in consultation with the operating room nursing staff and was designed to enable the measurement of varying degrees of preoperative instruction provided by the operating room.
nurses. After the initial assessments of the patients' learning needs, the nurses could remain in control of the interview/teaching activities, recognizing that each of the subjects had unique learning needs.

Interrater reliability for the teaching activities tool was accomplished through staff training sessions at which time several staff members would role-play a patient visit with the remainder of the group scoring the form. Initial interrater reliability tests showed 86 percent agreement for the 12 raters. During the first year of data collection, the investigators retested the operating room staff nurses at five and nine months, achieving 72 percent and 79 percent interrater reliability ratings, respectively. Internal consistency alpha coefficients, using Cronbach's standardized form, were .82 for cognitive teaching activities, .67 for sensory activities and .90 for participatory activities.

Dependent Variables

The dependent variables of this study were postoperative pain perception which was operationalized by the McGill Pain Scale (Appendix C) while postoperative pain behavior was operationalized by the number of doses of analgesics administered to the 88 subjects at 48 and 72 hours, respectively.
The McGill Pain Questionnaire is a measurement tool which was developed by Melzack (1975) to facilitate pain evaluation and thereby pain control. Melzack recognized pain to be a "variety of qualities, not a specific, single sensation that varies only in intensity" (p. 278). Melzack and Torgerson (1971) developed word classifications which described the pain experience. To establish the pool of descriptive terms for the questionnaire, clinical records and previous publications were utilized. From this listing, three major classes and 16 subclasses were developed and based upon sensory, affective and evaluative terminology. An intensity value was assigned each word by a group of subjects who included students, patients and physicians. Five words were chosen from the data which were scaled equally apart by standard deviation, and these words became the key words for a five-point intensity scale. Melzack (1975) reported questionnaire results from 297 patients with diverse diagnoses including cancer, dental, menstrual and post-surgical pain experiences. Four types of data emerged from the questionnaire which were developed into measurement scales. These scales consisted of:

1. "PRI (S): pain rating index based on the patient's mean scale values; this consists of the sum total of the score values of all words chosen in a given category (sensory, affective, evaluative) or for all categories.
2. PRI (R): pain rating index based on the rank values of the words; in this scoring system, the words in each subclass implying the least pain are given the value of one, the next word is given the value of two, etc.

3. N.W.C.: the number of words chosen.

4. PPI: the present pain intensity—the number-word combination chosen as the indicator of overall pain intensity at the time of administration of the questionnaire" (p. 283).

When testing for the questionnaire internal consistency, Melzack reported high correlations between these four measurement scales. In terms of test-retest, a group of 10 subjects repeated the completion of three questionnaires three to seven days apart. Melzack reported a mean consistency of 70.3 percent for the same choice of words for the scales.

Graham et al. (1980) reported the correlation of the affective and the sensory components of the McGill Pain Scale with the intensity rating of $r = 0.40$ and $0.36$, respectively. A significant correlation of $p < .01$ was found between the total pain rating index and the number of words chosen which replicated the results of Melzack. A mean consistency of 75 percent with which the subjects responded to the pain scale was also reported by Graham.

Reading (1979) administered the McGill Pain Scale Questionnaire to 166 women who complained of dysmenorrhea which resulted in his success of establishing pain profiles
for the subjects. Correlations were significant for the recall of the worst pain experienced and the total questionnaire score (r = 0.27; p < .001). Reading reported his findings were important, for the questionnaire could be used as a diagnostic tool with a 77 percent efficiency.

Hunter, Philips and Rochman (1979) reported the McGill Pain Questionnaire had proved highly accurate in the recall of head pain by 16 neurological patients. After five days the experimental group chose 76 percent of the same words for the sensory pain rating as they had at the time of the pain experience with a similar finding for the affective pain rating.

The internal consistency of the subscale of the McGill Pain Questionnaire used in the Operative Trajectory Study was determined through the computation of Pearson correlation coefficients (Table 1). Only the number of descriptive terms chosen by the subject (raw scores) were used in this study. Computations were made to compare subscale to subscale and each of the subscales to the total score. The criteria of r > .50, < .70 were considered acceptable for subscale-to-subscale correlation.

The data between the affective raw score (MELZAR) and the evaluative raw score (MELZER) (r = .37, p < .001) indicated that a low correlation existed and that the
Table 1. Internal consistency among subscales of McGill Pain Questionnaire: Pearson correlation coefficients (n = 54).

<table>
<thead>
<tr>
<th></th>
<th>MELSR</th>
<th>MELSAR</th>
<th>MELZER</th>
<th>MELZTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGill Sensory Raw</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(MELZSR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill Affective Raw</td>
<td>.73*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(MELZAR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill Evaluative Raw</td>
<td>.56*</td>
<td>.37</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>(MELZER)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill Total Raw</td>
<td>.97</td>
<td>.86</td>
<td>.62*</td>
<td>1.00</td>
</tr>
<tr>
<td>(MELZTR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Significance at p < .05 level

measurement may be inconsistent. The correlation coefficient for the sensory raw score (MELSR) and evaluative raw score (MELZER) (r = .56, p < .001) was as desired and indicated that no redundancy existed between these two scales. The relationship between the affective raw score (MELZAR) and the sensory raw score (MELZSR) was computed at the high r = .73 (p < .001) level which was indicative of redundancy between these two subscales.

The accepted level of measurement between the subscales of the McGill Pain Questionnaire and total raw score of the pain questionnaire (MELZTR) was set at r > .70. The correlations between the total raw score and the subscales
were expected to be high ($r > .70$). Only the evaluative raw score computed at a lower correlation ($r = .62$, $p < .001$) with the remainder of the pain questionnaire. While moderate internal consistency was estimated between the affective and sensory subscales, the evaluative subscale did not prove to be as statistically consistent as the other two subscales.

The dependent variable of postoperative pain behavior was operationalized in terms of the number of pain medications recorded for the subjects as 48 and 72 hours postoperatively. These data were collected by two investigators through the review of the subjects' charts. Inter-rater reliability for the recording of the data was measured at 90 percent.

Although Bruegel's (1971) research findings did not establish a relationship between anxiety and pain perception in surgical patients, she did report a positive correlation between the number of doses of analgesics administered with the patients quantified pain scores ($r = .38$). Fortin and Kirovac (1976) reported results from a comprehensive teaching program for surgical patients in which the teaching activities began prior to the patient's hospitalization. No difference was seen between the control and experimental groups after 24 hours in their use of analgesics. Over a
period of 72 hours, the experimental group was reported to have a mean of 140 mgm. less of analgesics received than the control group. Thus, the amount of analgesic received by surgical patients has been estimated to be a reliable indication of postoperative pain behavior.

**Data Collection Process**

The subjects in the experimental group received varying amounts of structural preoperative information from an operating room nurse (O.R. nurse) functioning in the perioperative role. The O.R. nurse, who was assigned to care for the subject intraoperatively, visited this patient in his/her hospital room the afternoon prior to the scheduled operation. Prior to entering the patient's room, the O.R. nurse conferred with a member of the unit's nursing staff to verify the patient's knowledge of the scheduled operation for the next day. Upon entering the patient's room and after the personal introductions and the establishing of rapport with the subject, the O.R. nurse assessed the individual's level of knowledge and learning needs in regard to his hospitalization and the nursing aspects of the surgical experience. This assessment process determined the amount of cognitive, sensory or participatory information provided each experimental subject which allowed for a flexibility in the individualization of each patient's care. The amount of
teaching activity engaged in was recorded on the teaching activity checklist by the O.R. nurse after leaving the subject's room (Appendix C). This same operating room nurse engaged in the evaluation of the intraoperative care provided the subject 24 to 48 hours postoperatively.

Those subjects assigned to the control group did not receive a preoperative visit or instruction from an operating room nurse. All subjects received the routine preoperative preparation provided by the unit nursing staff and other health care providers.

Statistical Analysis

The sample of 88 surgical patient population consisted of adult males and females between the ages of 19 and 72 years. The subjects were scheduled for elective, non-life-threatening orthopedic and abdominal visceral surgery in a Southwestern University hospital. The demographic data were the subject's age, sex and type of surgical procedure.

Description of Major Variables

The independent variable consisted of three types of teaching activities which were delivered preoperatively to the experimental subjects by an operating room nurse. The teaching included cognitive, sensory and participatory types of information which was individualized by the nurse for
each of the subjects visited. The type and amount of teaching was recorded on the teaching activity tool by the O.R. nurse after leaving the subject's room. The nursing care provided the experimental subjects was evaluated postoperatively by the same nurse.

Two dependent variables were considered in this study: postoperative pain and postoperative pain behavior. Descriptive terms of pain perception which were of sensory, affective and evaluative dimensions were chosen by the experimental and control subjects in their hospital room 48 to 72 hours postoperatively. The data collectors making this contact did not know of the experimental or control status of the subjects which therefore made this a double blind study. The second dependent variable, postoperative pain behavior, was determined by the number of doses of analgesics administered to the subjects at 48 and 72 hours. These data were obtained by chart review after the discharge of the subjects from the hospital.

Means and standard deviations were estimated for the control and experimental subjects for each major variable. Means are measurements of central tendency while standard deviations provide a reliable measure of variability and help to describe the normal curve (Downie and Heath 1965).

t-Tests were used to determine the significant differences between the experimental and the control groups
with each of the major variables. The level of significance for the t-tests was \( p < .05 \).

The Pearson product moment correlation coefficient (\( r \)) was used to estimate the strength of the relationships between the independent variables of postoperative pain perception and the number of postoperative analgesics received. The correlations were considered significant at the \( p < .05 \) level.

Multiple regression equations were used to determine the impact of the independent variable (teaching activities) upon the McGill Pain Scale scores and the number of doses of analgesics administered at 48 and 72 hours. Additionally, the impact of the McGill Pain Scale scores upon the number of doses of analgesics administered postoperatively at 48 and 72 hours was estimated.

**Limitations of the Study**

The delivery of the independent variable, preoperative teaching activities, by the O.R. nurse in the clinical setting has been identified as a limitation of this study. The decision to allow each nurse to determine the learning needs of the subject visited resulted in a wide variety of the teaching activities provided each subject during the preoperative visit. While this practice increased the clinical relevancy of the project, this decision created a
research design problem. Since the independent variable was not standardized, the variation in teaching had to be reported by the nurse using the teaching activity checklist. Although interrater reliability for the use of the teaching activity checklist was established, the quantity and quality of information provided differed with each visiting nurse.

The McGill Pain Questionnaire did not prove adequate in the clinical setting of this study. Although correlation coefficients of the sensory and affective subscales to the total raw score met the \( p < .05 \) significance level, only the correlation between the sensory and evaluative subscales met the acceptable significance level for subscale-to-subscale consistency.

The random assignment of the subjects to the experimental or control group was complicated by the staffing pattern of the operating room on weekends. Those patients meeting the criteria for the study could not receive the teaching activities preoperatively when scheduled for surgery on Monday. Early in the study, this group was not considered for inclusion in the study. When achieving the desired number of subjects became a critical issue in the data-gathering process, those patients who were scheduled for surgery on Monday and met the necessary criteria were assigned to the control group. This necessity disrupted the random assignment process.
Another design problem was created when the decision was made to broaden the criteria for subjects and include patients having selected orthopedic procedures. The surgery schedule of the operating room in the university hospital was not providing sufficient numbers of abdominal visceral operations needed to establish reliability for the study.
CHAPTER 4

PRESENTATION OF THE DATA

The statistical analysis and the findings of the data collected in the study are presented in this chapter. The results reported include the description of sample characteristics, tests of differences of the pain perception and pain behavior as experienced by groups and the magnitude of the study's relationships.

Description of Sample Characteristics

Eighty-eight subjects agreed to participate in the study, with fifty-four subjects in the experimental and thirty-four subjects in the control group (Table 2). The mean age for the experimental group was 40.9 years, with the ranges of ages from 20 to 73 years. The mean age of the control group was 40.2 years, with the range of ages from 19 years to 66 years. Two of the age values were missing from the control group data.

Sixteen (30 percent) of the 54 subjects included in the experimental group were males while 38 (70 percent) were females. In the control group nine (26 percent) of the subjects were males, with 25 (74 percent) being females.
The subjects in the experimental group experienced 10 (19 percent) orthopedic operative procedures and 45 (81 percent) experienced abdominal operative procedures. The control group subjects experienced five (15 percent) orthopedic operations with 25 (85 percent) of the subjects experiencing abdominal surgical procedures. No other demographic data was obtained from the study's subjects.

Table 2. Description of demographic data: the experimental and control subjects (n = 88).

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group (n = 54)</th>
<th>Control Group (n = 34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>40.9</td>
<td>40.2</td>
</tr>
<tr>
<td>Range of Ages (years)</td>
<td>20 to 73</td>
<td>19 to 66</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>.30</td>
<td>.26</td>
</tr>
<tr>
<td>Female</td>
<td>.70</td>
<td>.74</td>
</tr>
<tr>
<td>Type of Surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Surgery (abdominal)</td>
<td>.81</td>
<td>.85</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>.19</td>
<td>.15</td>
</tr>
</tbody>
</table>

Tests of Differences for Pain Perception and Pain Behavior

The purpose of this study was to determine whether surgical patients who received cognitive, sensory and participatory
types of information preoperatively from an operating room nurse would perceive less pain and would show decreased pain behavior postoperatively than those surgical patients who receive no preoperative instruction from an operating room nurse. t-Tests were computed to determine any differences which existed between the experimental (n = 54) and the control (n = 34) groups for each of the dependent variables. There were no significant differences noted between the two groups on the variables of pain perception or pain behavior at 48 and 72 hours (p < .05). The t-test results are presented in Table 3.

Magnitude of the Study's Relationships

In the theoretical model, the major variables of the study were consecutively staged with differing relationships suggested. Of the three types of teaching activities, it was predicted that the sensory information would have the greatest effect upon the postoperative pain perception, with an indirect effect upon the postoperative pain behavior. The magnitude of the influence of these three types of information upon the dependent variables, postoperative pain perception and pain behavior, were examined. Only the data from the experimental group (n = 54) are reported.
Table 3. Differences among experimental and control groups on pain experience.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-Test Value</th>
<th>Significance Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pain Behavior</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of doses of analgesics received at 48 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>7.8086</td>
<td>4.385</td>
<td>-.23</td>
<td>.882</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>8.0126</td>
<td>3.689</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of doses of analgesics received at 72 hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>10.1063</td>
<td>5.825</td>
<td>-.23</td>
<td>.882</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>10.3919</td>
<td>5.104</td>
<td></td>
<td></td>
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<tr>
<td><strong>Pain Perception</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill Sensory Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>4.8704</td>
<td>3.022</td>
<td>-.45</td>
<td>.650</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>5.1562</td>
<td>2.607</td>
<td></td>
<td></td>
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<tr>
<td>McGill Affective Raw Score</td>
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<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>1.0926</td>
<td>1.508</td>
<td>-.99</td>
<td>.323</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>1.4375</td>
<td>1.704</td>
<td></td>
<td></td>
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<tr>
<td>McGill Evaluation Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>.5741</td>
<td>.602</td>
<td>-1.21</td>
<td>.230</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>.7188</td>
<td>.443</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill Total Raw Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (n = 54)</td>
<td>6.5185</td>
<td>4.612</td>
<td>-.71</td>
<td>.470</td>
</tr>
<tr>
<td>Control (n = 34)</td>
<td>7.2188</td>
<td>4.312</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Significant Findings at p < .05 level.
Level of Relationships

Pearson correlation coefficients were computed to estimate the strength of the relationship between the independent and the dependent variables of the study. The level of significance for the correlation coefficient was set at the $p \leq .05$ level. The correlation matrix of the major variables for the experimental group is presented in Table 4.

It was predicted in the study's model that as the preoperative teaching activities increased the postoperative pain perception would decrease, i.e., negative, significant correlations were expected. Additionally, the less the subjects perception of pain, the less would be the pain behavior; positive significant correlations were expected. Additionally, the less the subjects perception of pain, the less would be the pain behavior; positive significant correlations were expected. The correlation between the independent variable, cognitive teaching activity (TAC), and the dependent variable, postoperative pain perception (MELZTR), was at the $r = .50$ ($p < .001$) level. In addition, a statistically significant correlation was noted between the sensory teaching activity (TAS) and postoperative pain perception ($r = .30$, $p < .05$). The correlation computed between the participatory teaching activities (TAP) and the dependent variable of pain perception was not significant. Cognitive
Table 4. Pearson correlation coefficients of the major variables for the experimental group (n = 54).

<table>
<thead>
<tr>
<th></th>
<th>TAC</th>
<th>TAS</th>
<th>TAP</th>
<th>MELZTR</th>
<th>MED 48</th>
<th>MED 72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Teaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity (TAC)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory Teaching</td>
<td>.72*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity (TAS)</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Participatory Teaching</td>
<td>.35*</td>
<td>.35</td>
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<tr>
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<td>.30*</td>
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<td>.02</td>
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<tr>
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<tr>
<td>Analgesics at 72 hours</td>
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<td>.003</td>
<td>-.03</td>
<td>.25</td>
<td>.98*</td>
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</table>

*Significance level of p < .05 level
and sensory empirical correlations were the reverse of those predicted for the independent variable and postoperative pain perception. The computed relationships suggest that as the cognitive and sensory teaching activities increased, the postoperative pain perception, as measured by the McGill Pain Questionnaire, also increased for the experimental group. It was predicted that an increase in sensory teaching activities would result in a negative correlation with the dependent variable of pain perception. The data do not support this prediction.

There were no significant correlations to report for the relationships between postoperative pain perception and the pain behavior of the experimental group. This lack of relationship did not support the positive prediction of the model which was that as the dependent variable of pain perception varied so would the pain behavior of the subjects.

Level of Influence

To complete the examination of the magnitude of the relationships between the independent and dependent variables, multiple regression analyses were computed. Again, only the computations for the experimental group are presented.

The results of the multiple regression analysis for the independent variables, sensory, cognitive and participa-
tory teaching activities, with the dependent variable, postoperative pain perception, are presented in Table 5. These data indicated that the three teaching activities accounted for 26 percent of the variance ($p = .001$) with the cognitive teaching activity showing the only significant path. The lack of significance for the sensory and participatory teaching activities did not support the prediction that the sensory information would have the greatest impact upon the postoperative pain perception.

Table 5. Multiple regression analysis: dependent variable McGill Pain Questionnaire with the teaching activities ($n = 54$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Significance</th>
<th>$R^2$</th>
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<tr>
<td>Sensory Teaching Activity (TAS)</td>
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* $R^2 = .261$ ($p < .05$)

Examination of the impact of the three teaching activities and pain perception upon pain behavior at 48 hours (Table 6) revealed that there were no significant findings. The conceptual structure of the model had predicted that as
the teaching activities increased and the pain perception decreased that pain behavior at 48 hours would also decrease.

Table 6. Multiple regression analysis: dependent variable number of doses of analgesics received at 48 hours with the teaching activities and McGill Pain Questionnaire (n = 54).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Significance</th>
<th>R²</th>
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</thead>
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<td>.175</td>
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R² = N.S.

Table 7 presented the results of the multiple regression analysis for the independent variable of teaching activities and the dependent variable of pain perception, with the number of doses of analgesics received at 72 hours. None of the estimates met the study's established level of significance (p < .05). There was no causal effect indicated by the multiple regression analysis between the independent variable of teaching activities and the two dependent variables measuring pain behavior.
Table 7. Multiple regression analysis: dependent variable number of doses of analgesics received at 72 hours with the teaching activities and McGill Pain Questionnaire (n = 54).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Beta Coefficient</th>
<th>Significance</th>
<th>R²</th>
</tr>
</thead>
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<tr>
<td>(MELZTR)</td>
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<tr>
<td>R² = N.S.</td>
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</table>

Summary

A total of 88 subjects were involved in this study, with 54 subjects assigned to the experimental group and 34 subjects in the control group. The demographic data gathered included the subjects' mean age, range of ages for each group, sex and types of operations. Although there was a wide range in ages for both groups, experimental group ranged 20 to 73 years with the control group range of ages from 19 to 66 years, there were no significant differences noted between the two groups.

To determine whether the surgical patients who received preoperative teaching activities from an operating
room nurse would perceive less pain and show decreased pain behavior postoperatively than those surgical patients who received no teaching activities from an operating room nurse, differences of pain perception and pain behavior by groups were computed. The analysis of t-test results indicated that no differences existed between the experimental and the control groups.

It had been predicted in the study's theoretical model that as the preoperative teaching activities increased the postoperative pain perception would decrease. Additionally, the less the subject's perception of pain, the less the pain behavior expected. The level of relationship between the independent and dependent variables of the study was estimated through computation of Pearson correlation coefficients. Statistically significant correlations were reported between the cognitive and the sensory teaching activities and the postoperative pain perception but in the direction opposite from that predicted. The correlation was not significant between the sensory teaching activity and pain perception. These data do not support the prediction made in the study's model.

Multiple regression analysis was used to complete the examination of the magnitude of the relationships between the independent and dependent variables of the control
group. The three teaching activities were estimated to impact on postoperative pain perception ($R^2 = .26; p < .05$). The only significant regression coefficient ($p < .05$) was for the cognitive type of teaching activities. These data do not support the theoretical structure of the study's model for the direction of the regression coefficient was opposite from that predicted. As a greater degree of cognitive teaching activities were given, pain perception was increased.
CHAPTER 5

DISCUSSION OF THE FINDINGS

In this final chapter the findings from the data analysis of this study will be examined and emerging clinical issues will be identified. Additionally, implications for nursing practice and future direction for nursing research will be discussed.

Differences in Pain Experiences

Teaching-Learning Theory has been used successfully to effect change in human perception and behavior in acute health care settings. Research by Egbert et al. (1964) and Johnson et al. (1974, 1978) reported that the provision of instruction by health care providers resulted in the reduction of the amount of analgesics received by patients undergoing surgery and endoscopy examination. In this quasi-experimental study, the impact of perioperative nursing practices upon the surgical patient's postoperative pain experience was measured by the McGill Pain Questionnaire and the number of doses of analgesics received at 48 and 72 hours. It was predicted that those subjects who received preoperative teaching from operating room nurses would
perceive less postoperative pain and therefore receive fewer
doses of analgesics than the subjects who received no pre-
operative instruction from operating room nurses.

$t$-Tests were computed for the measurement of any
significant differences between the dependent variables of,
pain perception and pain behavior of the experimental and
control groups. There were no significant differences found
between the two groups at the $p < .05$ level. These findings
did not support the research of Egbert and Johnson.

The clinical setting for this study was a university
hospital which admits many patients through referrals from
local physicians and those from surrounding rural communi-
ties. Therefore, the type of operative procedure performed
tends to be more complex from those which are scheduled in
many of the local acute care hospitals. To achieve the
number of subjects necessary for this study's reliability,
it was necessary to expand the original patient criteria
from abdominal operations to include selected orthopedic
procedures. Additionally, it was necessary to consider all
adult age groups for inclusion in the study.

Although the demographic statistics of the experi-
mental and control groups did not differ significantly, the
far-ranging differences of ages and types of operations may
account for the lack of significant findings between the
dependent variables of the experimental and control groups. In previous research, Forrest (1968) identified the extremes of age as a factor in the incidence and severity of postoperative pain, while Collins et al. (1968) reported upper abdominal wounds elicited greater pain than that elicited by low abdominal wounds. It is suggested that a larger sample size along with a more definitive criteria for subjects is necessary to achieve the needed data. In Chapter 3, the necessity to eliminate random assignment for those patients scheduled for Monday surgery was discussed. This compromise of the random element was made to achieve the numbers necessary.

In the conceptual level of the study's model, it was predicted that preoperative teaching activities and selected patient learning would have a negative impact upon a decrease in the postoperative pain perception of the experimental group. Based upon the research of Johnson et al. (1973, 1974, 1978) it was predicted that sensory information would have a greater impact upon the pain perception than the other two types of teaching activities. Pearson correlation coefficients were computed to measure the strength of the relationships between the independent variable of teaching activities and the dependent variables of postoperative pain perception and pain behavior. Although statistically
significant correlations were noted between the cognitive and sensory teaching activities and postoperative pain perception at the $p = .05$ level, the correlations were in the reverse of the model's predictions. As the amount of teaching activities increased, so did the patient's postoperative pain perception as measured by the McGill Pain Questionnaire. There were no significant relationships noted between the two dependent variables which also did not support the prediction that as the postoperative pain perception varied so would the postoperative pain behavior of the experimental subjects.

The model of this study implies that if preoperative teaching activities are provided by operating room nurses, selective patient learning will occur. Janis (1958) had identified the health care environment as being perceived as life-threatening by many patients but one which could be confronted by persons when factual information was provided to them. In their parallel response theory, Johnson and Leventhal (1971) suggested that fearful persons are motivated to control their environment through cognitive structuring which may be operationalized through the seeking of information.

While it is difficult to explain the positive direction taken by the correlations between the cognitive and
sensory information and the postoperative pain perceptions indicated by the data analysis, a number of explanatory possibilities exist. The teaching activity tool was designed for the measurement of the three types and amounts of teaching activities engaged in by the operating room nurses. The recognition that not all surgical patients need or desire the same amount and type of preoperative information enabled the nurses to assess each patient's learning needs and deliver individualized information. The positive correlation reported may be related to an encouragement provided the experimental group by the operating room nurses to report pain postoperatively. Individualization of teaching activities was not a part of Johnson's research. In her studies (1974, 1978), each group of patients received information which was taped and provided for better control of the presentation of the teaching activities.

A potential weakness of this study was that no provision had been made for the measurement of the patients' selective learning processes. Recent literature suggests that adverse learning results from information overload (Hinshaw et al. 1978). In the university setting, patients are exposed to a multitude of teaching activities by primary care providers, students and faculty. The field noise of this environment would not be found in a laboratory or a
more controlled setting. It must be recognized that unique problems arise when laboratory findings are applied to real world situations.

Multiple regression analyses were computed to determine the impact of the teaching activities upon the postoperative pain experience. Only cognitive teaching was found to be significant ($p = .001$) by accounting for 26 percent of the variance for postoperative pain perception.

Because of the subjective nature of the pain experience, its measurement has proven to be enigmatic. The McGill Pain Questionnaire was designed to facilitate pain evaluation, for the numerous facets of pain were considered in the tool's formulation. Although recently designed, the McGill Pain Questionnaire (Melzack 1975) was chosen as the measurement tool for pain perception in this study because of its previously reported consistency (Reading 1979, Graham 1978, Hunter 1979) and its encompassing measurements. In this clinical study, the questionnaire performed with only moderate internal consistency. Its application in the clinical setting was sometimes difficult and time-consuming for the subjects to complete. Melzack (1975) had indicated the necessity for the researcher to provide assistance and clarification when subjects engaged in the completion of this tool. This service was not provided the subjects of
this study and may account for some of the inconsistency in
the subscales performance. It is recommended that in future
research where the McGill Pain Questionnaire is indicated
that Melzack's protocol be utilized.

**Implications for Practice and Future Direction for Nursing Research**

Although this study did not provide answers to the research questions asked, the data suggests pertinent implications for practice and research. Additional study would be appropriate in the areas of patient education and post-operative pain experiences.

The need for patient education was identified by Linehan (1966) almost two decades ago. This activity is perceived by both nurses and hospital administration as a role activity for nursing, yet there remains a hesitancy by many nurses to incorporate patient teaching into their practice. Nursing leadership must determine if, in fact, this is a feasible and legitimate responsibility for nurses when cost containment and under-staffing have become commonplace practices in the provision of health care.

Questions remain as to the types and amounts of teaching activities required for patient learning to occur. The teaching provided in this study was individualized to meet specific patient needs. This practice is costly and
time-consuming. In Johnson's studies, the teaching activities were recorded and not individualized, yet the results reported were of significant impact upon the postoperative patient outcomes. The cost effectiveness of "canned" educational materials in health care settings should be considered in future studies.

The postoperative pain experience of patients was described by Cohen (1980) as being amenable to nursing practices. The postoperative pain of a surgical wound is a subjective experience which has been associated with the length of the recovery period of the surgical patient (Wallace and Norris 1975). While analgesics have remained the primary treatment for surgical pain, there have been no objective tools developed for the measurement of the pain experience. While physicians are the primary health care providers who prescribe for pain control, nurses assess and evaluate the effectiveness of the medical treatment. Consequently, nursing judgement many times determines the amount and frequency of the administration of analgesics for the pain control in post-surgical patients. An objective means for the measurement of the effectiveness of pain control programs would greatly enhance the postoperative recovery of surgical patients.

Other means for pain control which are available to nursing practice must also be investigated clinically. This
would include the effects of behavioral modification tech­niques which have been utilized in selective patient care settings. The effectiveness of the basic comfort techniques which are frequently used in nursing practice must be established through research.
APPENDIX A
Janice R. Allen, R.N.
College of Nursing
Arizona Health Sciences Center

Dear Ms. Allen:

We are in receipt of your project, "Relationship and Effect of Pre-operative Visiting on Stress Outcome and Recovery Patterns of Surgical Patients", which was submitted to the Human Subjects Committee for review. We concur with the opinion of your Departmental Review Committee that this is a minimal risk project. Therefore, approval is granted effective 27 September 1977.

Approval is granted with the understanding that no changes will be made in either the procedures followed or in the consent form to be used (copies of which we have on file) without the knowledge and approval of the Human Subjects Committee and the Departmental Review Committee. Any physical or psychological harm to any subject must also be reported to each committee.

A university policy requires that all signed subject consent forms be kept in a permanent file in an area designated for that purpose by the Department Head or comparable authority. This will assure their accessibility in the event that university officials require the information and the principal investigator is unavailable for some reason.

Sincerely yours,

Milan Novak, M.D., Ph.D.
Chairman

cc: Ada Sue Hinshaw, R.N., Ph.D.
Co-Investigator
APPENDIX B
Subject Consent Form

Title of Project: Relationship and Effect of Preoperative Visiting on Stress Outcome and Recovery Patterns of Surgical Patients

The nursing staff in the operating room are interested in evaluating the effectiveness of their care. The staff are most interested in how you are feeling after your surgery and your opinion of the care you received from them.

In order to evaluate how you feel and to obtain your opinion of the care you received from the OR staff, you are being asked to complete several questionnaires which take approximately 20 minutes. Your participation in the study is voluntary and you can withdraw from the study at any point. You may choose to not answer any or all of the questions according to your judgment without influencing your health care in any way.

The data will be kept confidential. Your name is not on the questionnaires; only your hospital I.D. number is recorded in order to keep all the information you give us together. The information you give us will be used and reported only in group form. The individual data will be kept in locked files and will be seen only by the nurse researchers conducting the study.

While you personally will not benefit from this study, patients in general will benefit from nurses having a better understanding of how to more effectively provide care to their patients. There is neither any financial cost or reimbursement for participating.

Name of Patient____________________________

Date_______________________________________

Name of Researcher__________________________
APPENDIX C
CHECK ONE:  RN  
Student Nurse  

Patient I.D.  
Date:  
Unit:  
Shift:  

Checklist:  Teaching Activities In Pre-Operative Visit  

General Atmosphere: Friendly, Quiet, Uninterruptive  

Teaching Activities  

I. Introduction  
A. Personal introduction of nurse from the O.R. who will be with patient the next day.  
B. Explain purpose of visit - not an unusual happening.  
C. Gain level of patient's understanding of anticipated procedure, e.g., previous hospitalization at Arizona Health Sciences Center.  
D. Physical history: patient's allergies, disabilities, etc.  

II. Ward and O.R. Nursing Routines  
A. Pre-op preparation on ward evening prior to surgery - skin shave, light diet, no fluids, etc.  
B. Sensations: will feel itchy after prep/ hungry after NPO.  
C. A.M. preparation - hypo-purpose to relax, not produce sleep, remove jewelry, dentures, etc.  
D. Sensations: feel drowsy, little spaced out.  
E. Time of Operation  
F. Relatives waiting area  
G. Transport to O.R. - visual encounters - what will see.  
H. Sources of information for family.  

III. Pre-op Holding Area  
A. Other patients, attendant  
B. Patient's comfort important  
C. Cap for hair  
D. Activities: e.g., IV started, identiband checked  

Degree of Discussion  
(Check Appropriate Category)  

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CONTINUED --
IV. Operating Room Proper
A. This nurse will be there -
B. Cold room, warm blankets, bright lights
C. Table not too comfortable
D. Safety belt, Bovie pad (take one to patient)
E. Sensations: will feel restrained/pad cold and gooey.
F. Object - to make patient as comfortable as possible.
G. Overview of room and activities
H. Urinary catheter - drains, tubes, etc.
I. "Sleep" or spinal determined by anesthesiologist

V. Recovery Room
A. Will awaken with people encouraging them to cough and deep breath, leg movement - move legs if spinal.
B. Sensations: when waken, feel mask on face - mist blowing.
C. Relatives will be notified and visited in waiting room by surgeon.
D. No visitors in R.R.
E. Return to ward when awake and all okay.

Techniques To Be Taught:
- Cough
- Deep Breath
- Wound Splinting
- Moving in Bed

Conclusion: Reiterate Important Points
A. Time of operation
B. Relatives
C. Cough - deep breathing significance
D. Patient comfort and safety
E. Encourage patient to ask questions and for assistance when needed
What Does Your Pain Feel Like?

Some of the words below describe your current pain. Circle ONLY those words that best describe it. Leave out any category that is not suitable. Use only a single word in each appropriate category—the one that applies best.

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<td>Itchy</td>
<td>Sore</td>
<td>Taut</td>
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SELECTED BIBLIOGRAPHY


Jordan, Clifford H. "If We Teach Holistic Care, Can We Exclude Perioperative Nursing?" AORN Journal, 32: 797-798, November 1980.


