The Effect of Nursing Intervention on Anxiety of Post Operative Patients

Phyllis C. Nicolaou
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THE EFFECT OF NURSING INTERVENTION ON ANXIETY OF POSTOPERATIVE PATIENTS

by

Phyllis C. Nicolaou

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the Degree of Doctor of Education

Western Michigan University Kalamazoo, Michigan April 1978
ACKNOWLEDGMENTS

In appreciation to Dr. Uldis Smidchens who directed this study and gave needed support and guidance at crucial periods throughout its preparation. The assistance of Drs. Barbara Horn, Robert Travers, and Chris Koronakos, who served on my committee, is also deeply appreciated.

To Patricia Middleton and Muriel O'Leary, Directors of Nursing, and their nursing staff my sincere appreciation. Their efforts and cooperation enabled this study to be done.

To the patients who served as subjects in this study I am very grateful. Each one of them participated so that nursing might learn more about the delivery of health care to the patients who come after them.

Phyllis C. Nicolaou
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Mean Digital Sweat Levels (DSL) Over Five Time Conditions
CHAPTER I

PURPOSE OF STUDY

This study was intended to subject to experimental investigation the effect of a nursing intervention treatment on the anxiety component of patients' postoperative pain experiences. Several clinically specific recovery rate indices and the postoperative anxiety level were used as a measure of the effect of the experimental treatment. Additionally this study investigated whether a differential effect of the nursing intervention treatment existed for subjects who had experienced high or low levels of life stress in the year preceding surgery. Also, the study investigated whether a differential effect of the nursing intervention treatment existed for subjects who experienced high or low levels of anxiety preoperatively.

The assumption underlying the relationship of anxiety to the pain experience is that when one experiences pain there is a corresponding increase in anxiety or emotionality. Anxiety increases the perceived intensity of the pain sensation while simultaneously decreasing the tolerance level for pain. This relationship has an obviously cumulative effect and points to the importance of intervention to reduce the circular interacting relationship that exists between anxiety and pain. Lesse (1970) suggests that the reduction

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of anxiety associated with the experience of pain would correspondingly decrease the pain intensity and raise the individual's tolerance for the pain experience. McCaffery (1972) states, "When anxiety becomes associated with pain, a reduction in this anxiety will contribute to pain relief. The basic reason for early application of a pain relief measure is related in part to the control of anxiety" (p. 101).

Significance and Nursing Implications of the Study

A search of the literature revealed that considerable research has been done on the effect of preoperative, cognitive preparatory information on postoperative recovery rate indices (Andrew, 1970; Egbert, Battit, Welch, & Bartlett, 1964; Janis, 1965; Johnson, J. E., 1973, 1975, 1976; Johnson & Rice, 1974). Comparatively few studies have subjected to clinical experimental investigation the effect of postoperative interventions on the anxiety level of surgical patients and recovery rate indices (Bochnak, Rhymes, & Leonard, 1962; Diers, Schmidt, McBride, & Davis, 1972).

The subjection of nursing intervention techniques to empirical clinical study is basic to the development of a theory of nursing. Aydelotte (1976) states,

Great attention should be given to the development of criteria that can be used to measure the effectiveness
of nursing practice in terms of patient outcomes. What is greatly needed are studies demonstrative of the effectiveness or non-effectiveness of nursing practice upon patient recovery. (p. 6)

The need for outcome measures which differentiate quality of nursing care is a primary research focus in nursing, responding to quality assurance and nursing accountability to the client. It is intended that the measure of anxiety used in this study may ultimately serve as a validated and reliable discriminator of the quality of nursing care for the postoperative patient. Such an unobtrusive and easily obtained quality assessment tool would, through its discriminatory power, serve the need of evaluation of particular nursing practices and quality of health care delivery. Such a tool would contribute to the ultimately necessary psychological criterion measures on which quality nursing care might be evaluated. Straus, Fogerbaugh, and Glaser (1974) make the statement that, "Until staff become genuinely accountable for their pain work, there will be little improvement in the care of the patients, except that which is effected fortuitously or temporarily by virtue of an unusually skilled, compassionate or sensible staff member" (p. 561).

Nursing has attempted to achieve consensus among nursing experts, through use of the Delphi technique, about the most important areas for nursing research. The following items were considered to be the most important areas of research value for the
professions: (1) the determination of valid and reliable indicators of quality nursing care; (2) the development of a set of physical and psychological assessment procedures that provide information necessary for nursing intervention and improved patient care; (3) the determination and evaluation of interventions by nurses that are most effective in reducing psychological stress of patients; (4) the evaluation, in terms of patient outcomes, of processes used to provide nursing care; and (5) the study of nursing interventions of the management of pain (Lindeman, 1975). If the measures used in this study discriminate significantly between the experimental and control group, each of the research needs cited by Lindeman will in some way be served.

Nursing theory and clinical practice describe numerous techniques which may appropriately be used to provide psychological support and comfort to the patient in pain. This psychological support is viewed by essentially all nursing authors as a primary role function of the nurse in treating patients with pain. McCaffery (1972) has indicated, however, that in actual practice this function is rarely performed by nurses. McCaffery (1972) states,

Inability to describe nursing interventions is probably one reason nurses tend to do so little for the patient with pain. Both research and informal observation repeatedly confirm the idea that most nursing intervention related to pain is confined to the administration of an analgesic. (p. 79)
Nursing intervention processes to reduce the anxiety component of the pain experience are described and delineated by several nursing authors (Brunner, Emerson, Ferguson, & Suddarth, 1970; Crowley, 1962; McCaffery, 1972). The experimental treatment (i.e., Nursing Intervention Treatment) used in this study was based on the efficacy reported for such interventions by nursing theorists, clinicians, and direct patient testimony.

Pain is a psychologically discomforting experience, and as such those interventions which promote psychological and physical comfort are significant in the treatment of pain. The removal of extraneous noxious stimuli is one method of promoting comfort. The postoperative patient is frequently subjected to the following noxious stimuli: (1) noise; (2) excess light; (3) unfamiliar sights and odors; (4) wet, soiled, wrinkled bedding and dressings; (5) misalignment of body parts; and (6) wet and unclean skin. The removal of such noxious stimuli to promote psychophysiological comfort and reduce the anxiety response to such stimuli was proposed as one aspect of the experimental treatment being tested in this study.

Anxiety arises when one feels one is in an unpredictable situation where one is uncertain and lacks control. Studies (Badia, McBane, Suter, & Lewis, 1966; Bowers, 1968; Glass, Singer, & Friedman, 1969; Lanzetta & Driscoll, 1966; Pervin, 1963) have
shown that reduction of stimuli impact occurs when one believes one has the ability to control the stimulus and when one has knowledge which results in an increased predictability about the stimulus. Aspects of the Nursing Intervention Treatment of this study were designed to address the need for control and predictability of the pain experience by the patient. Such control and predictability may reduce the anxiety caused by helplessness and lack of knowledge about what to expect in a situation.

Neufeld and Davidson (1975) suggest that a state of uncertainty increases anxiety. When one is unfamiliar with presenting stimuli such as intravenous infusion, sutures in one's skin, and extraneous tubing leading from body orifices, one is faced with a high degree of uncertainty and potential anxiety about such equipment. An additional aspect of the Nursing Intervention Treatment designed for use in this study addressed the need for patient knowledge and reassurance about the functioning of such apparatus.

Reviewing descriptions and comments of patients about pain, the following needs emerged (Copp, 1974). Patients feel a need to talk about and describe the pain to a person whom they perceive as having the necessary knowledge and resources to relieve the pain. The need for patients to experience a prompt response from helping people to the expression of their pain is also important. This need possibly assumes great importance due to the altered and distorted
time perception when one is in an anxious state. Patients identify the need to believe that persons in the helping role have the necessary skill and resources to provide relief from pain. Another important need identified through patient accounts, is the need for the physical presence of another; not to be left to suffer alone during the pain experience.

This study proposed then to subject to experimental investigation the effect of a Nursing Intervention Treatment on the anxiety level, in response to the pain experience, of postoperative abdominal surgery patients. In addition the study attempted to determine the relationships between reduction of postoperative anxiety during the pain experience to other indices which might predict both the quality and rate of recovery from the stress of surgical intervention. These indices included: (1) mean body temperature during the initial 72-hour postoperative course, (2) the mean number of analgesics received during the initial 72-hour postoperative period, and (3) the mean number of ambulatory efforts during the initial 72-hour postoperative period.

Additionally, this study proposed to investigate the differential effect of the Nursing Intervention Treatment on those postoperative patients who evidenced extremely high or extremely low scores on the Schedule of Recent Experiences Scale (Rahe, 1974). This scale measures amount of life stress which a person has
experienced because of significant changes in his life. In the context of this study, subjects who had experienced high life stress during the year preceding surgery may show a decreased coping ability for the additional stress of surgery. Consequently, these subjects might require and respond differently to the Nursing Intervention Treatment than those subjects who experienced only minimal recent life stress and would therefore be better able to cope independently and with less anxiety to the pain and stress of surgery. Also the study investigated whether a differential effect of the Nursing Intervention Treatment operated for those subjects experiencing high levels of preoperative anxiety.

Theoretical and Operational Definitions of Concepts

Pain--"A complex psycho-physiological response to noxious stimulation" (Wolff & Wolf, 1958, p. 5). "Pain is an emotional experience, an affect, and is defined by the person experiencing it, and exists when he says it does" (McCaffery, 1972, p. 7). For purposes of this study, pain is an affective response to noxious stimuli and will be said to exist when the patient says it does.

Anxiety--A psychophysiological response that may be elicited by many different stimuli. "A complex pattern of response characterized by subjective feelings of apprehension and tension accompanied
by or associated with physiological activation or arousal" (Paul, 1969, p. 64). A distinction between fear and anxiety will not be made for purposes of this study, therefore a response-oriented definition rather than a stimulus-oriented definition will be used (Barclay & Sroufe, 1970).

**Nursing Intervention Treatment**—A series of interventions designed to promote a state of psychophysiological relaxation and feelings of comfort. Lazarus (1966) and Wolpe and Lazarus (1966) conclude that the feelings of relaxation and well-being are presumed to be incompatible with anxiety.

The Nursing Intervention Treatment used in this study was designed to address patient needs for: (1) recognition of patient selfhood by the care giver, (2) cognitive information about analgesic medication schedule, (3) prompt response of care giver to patient's communication of pain, (4) the physical presence of the care giver during the acute phase of the pain experience, (5) removal of extraneous noxious stimuli, (6) cognitive information about the functioning of unfamiliar equipment being used, and (7) reinforcement by the care giver of the patient's previously successful pain coping skills.

**Outline of the Report**

Chapter II is a review of relevant theoretical literature and empirical and clinical research findings. Chapter III details the
experimental design, methodology of the study, and includes methods used to train the nursing staff in the experimental Nursing Intervention Treatment. Chapter IV is an analysis of the results of the study. Chapter V details the limitations of the study, proposes theoretical interpretations of the findings, discusses implications of the study for nursing care, and proposes recommendations for further research.
CHAPTER II

LITERATURE REVIEW

Concept of Affect

The interrelationship among man's physiological, affectual, and cognitive states has been theorized by philosophers, theologians, physiologists, and psychologists. Milestone theoreticians include Darwin, James-Lange, and Cannon. A survey of the primary theories of affect states was conducted and presented here because affect is generically related to the specific concept of anxiety.

Darwin (1897) theorized three basic principles of emotion. The first being that man expresses certain mind states by habitual behavior. Darwin equates habitual behavior and reflex actions. The second principle, "Antithesis," is stated:

When actions of one kind have become firmly associated with any sensation or emotion, it appears natural that actions of a directly opposite kind, though of no use, should be unconsciously performed through habit and association, under the influence of a directly opposite sensation or emotion. (p. 65)

The third principle stated by Darwin is that certain behaviors are a direct result of the action of the nervous system and these behaviors are not subject to either will or habit. Darwin anticipates later attempts to measure emotionality by physiological measures when...
he discusses the effect of mind states on heart action, musculo-
skeletal system, gastro-intestinal system, and vaso-motor function.

Historically, the James-Lange theory of emotion has impor-
tance in the development of the following paradigm: perception of
event → organic bodily changes (action) → feelings → resultant
emotionality (Plutchik, 1968, p. 28). This paradigm explained the
relationship of each critical concept in James-Lange's theory of
emotion. James-Lange's theory attempted to replace the earlier
paradigm of emotionality as, "perception of a situation, feeling of
an emotion, and then action, either overt or internal or both"
(Plutchik, 1968, p. 20).

Cannon (1927) theorized from his experiments with decorticated
cats that the thalmus was the seat of the emotions and that bodily
changes (actions) were not the direct precursors of emotional
changes. Cannon's research was the first attempt to explore the
specific neurophysiological structures whose function would explain
the development of emotionality.

Schachter (1966) proposed that it was not bodily states nor the
thalmus which were primarily responsible for the development of
emotional states, but that cognitive factors might be the major
determinants of emotion (p. 194). Schachter (1966) cites other
authors, Hunt et al. (1958) and Ruckmick (1936), who have also sup-
ported the appraisal, evaluation of threat, and labeling function of
cognition in response to the physiological aroused state. The role of cognitive appraisal of stimuli, as positive or negative, was also theorized by Arnold (1960). Schachter (1966) cites the subjection of his theory to a series of experimental studies by Schachter and Singer on 185 male college student subjects. The researchers manipulated physiological arousal through injections of a sympathomimetic drug (adrenaline); sympathomimetic blocking drug (chlorpromazine); and cognition through states of information, no information, and misinformation. The primary results supported the duality theory of emotion: (1) physiological arousal and (2) cognitive interpretation or labeling of feeling, influenced by present situation stimuli, combine to result in a state defined as emotionality.

Schlosberg (1954) postulated the activation theory of emotion. This theory views all emotionality on a quantitative behavior continuum from minimal organism activity states to high organism activity, the latter defined as intense emotional states. In addition, "the qualitative dimensions of pleasant-unpleasantness, and attention-rejection are parts of this model" (Plutchik, 1968, p. 30).

Leeper (1948) has theorized emotions as motivating forces which arouse, sustain, and direct behavior. According to Plutchik (1968) this theory is similar to the emergency or stress theory of Hans Selye, but differs from Selye's stress theory in that positive emotions are included in the motivation theory of Leeper.
The behavioristic theories of emotion are partially exemplified by the writings of Watson, Tolman, and Skinner. Plutchik (1968) summarizes Watson's theory of emotion as, "an unconditioned response or group of responses which occur with some consistency and regularity to a given stimulus" (p. 35). Plutchik (1968) points out that Tolman conceptualizes emotions as organismic responses to effect a change on a stimulus (p. 36). Skinner defines emotion as, "a particular state of strength or weakness in one or more responses induced by any one of a class of operations" (Plutchik, 1968, p. 37).

Theories of Anxiety

Spitz (1963) and Engel (1963) have discussed the ontogenetic development of anxiety as a discreet emotion and therefore it may be conceptualized as a specific affectual response. Engel (1963) concluded that anxiety is, "a true ego state, that involves not only the concept of danger but also of relief through the activity of an object" (p. 276). This duality of anxiety appears to stem ontogenetically from the infant's experience with primal anxiety and the accompanying relief of this anxiety by the presence of significant others. Engel (1963) further elaborates on the interpsychic experiences of self-weakness and helplessness which the experience of anxiety generates and which can be relieved through interpersonal experience (pp. 276-277).
The philosophical and religious literature relative to anxiety is tangential to this study and therefore will not be reviewed. May (1950) reviews the conceptualizations of such notable theorists as P. Tillich, R. Niebuhr, M. Heidegger, and S. Kierkegaard for those who desire further understanding of the conceptualization of anxiety by religious and philosophical theoreticians.

Anxiety as a subjective response to catastrophic events is the theoretical development of Kurt Goldstein (1940). This theory postulates both the significance of the individual's subjective response based on his interpretation of the meaning that an external event has for him and the objective reality threat inherent in the event. "An organism needs to make itself adequate to its environment and its environment adequate to itself. When this cannot be done, anxiety results" (May, 1950, p. 55). One might extrapolate from this theory that one's previous experiences with the presenting stimuli tend to structure one's present perception of degree of threat or non-threat which the event poses. The amount and quality of previous experience with present stimuli may serve an adaptive or maladaptive purpose as one attempts to cope with stimuli. Goldstein (1940) also postulates the effect of accumulative stress on the individual: the "threshold" of coping beyond which additional stress becomes "catastrophic" and anxiety exists. Grinker and Spiegel (1945) and Janis (1965) also elaborate on the accumulation of stress producing
events, reaching to an individual threshold of tolerance, after which
distress and anxiety occur.

Freud (1936) theorized about anxiety from his clinical analyti-
cal interactions with the mentally ill of the Victorian era. His
early theory of anxiety was that anxiety arose as a result of
repressed sexual tension. Later, he conceptualized that anxiety
was a signal of threat which arose from external situations which
the ego perceived as threatening. Freud differentiated normal from
neurotic anxiety on the basis of the source of threat; normal anxiety
arises from external sources of threat and neurotic anxiety from
internal repressed threat sources. Significant was Freud's descrip-
tion of the unpleasant, anticipatory dread and physiological arousal
dimensions of anxiety (Spielberger, 1966, p. 9).

Mullahy (1970), writing about the theoretical formulations of
anxiety proposed by the psychoanalyst Harry Stack Sullivan, states,

In Sullivan's more mature formulations, it is a
felt threat to, or actual loss of, self-esteem owing to
the actual, anticipated, or imaginary disapproval of
significant other people or of disapproval of one's self,
owing to the values and ideals one has acquired or
developed. (p. 484)

The prototype human interaction for the development of anxiety, was
in Sullivan's view, the mother-infant relationship. Significant was
Sullivan's contribution that the presence of anxiety distorts and
limits the individual's perception of reality and external stimuli.
Cattell (1966) experimentally validated a two-dimensional nature of anxiety. (Freud theorized in his concepts of neurotic and object anxiety a two-dimensional nature of anxiety; neurotic anxiety being generated by internal sources of danger and relatively personality pervasive; object anxiety being generated by external sources of danger and relatively consciously stimulus bound.) Cattell (1966) factored variables that appeared to be associated with a relatively abiding personality state (trait anxiety) and those that existed in a time limited, situational state (state anxiety). This conceptual differentiation of anxiety into "state" and "trait" anxiety gave rise to research which contributed to the identification of stimulus situations which arouse state anxiety and the "properties of the anxiety state" (Spielberger, 1966, p. 13). Spielberger (1966) cites the work of Spence, and Spielberger and Smith in relating trait anxiety to state anxiety. These researchers found that the stimulus of stress has greater potentiality for state anxiety generation, provided that the individual cognitively views the stimulus as threatening, in persons who evidence high levels of trait anxiety as measured by the Taylor Manifest Anxiety Scale (Spielberger, 1966, p. 15).

Atkinson (1964) hypothesized that the fear of failure is a motivating stimulus for the activation of state anxiety states. Under the stress of surgery and hospitalization, one might hypothesize, that the fear of failure might be related to the individual's fear of
the failure of his own corporeal body to withstand and prevail through the stress of such stimuli. Bettelheim (1962) states, "one of the greatest anxieties of every human being is the fear for the integrity of his body" (p. 73). One generalizes fear and anxiety responses from one set of stimuli to other stimuli closely associated, either temporally or cognitively (Wolpe & Lazarus, 1966, p. 7). It is reasonable that hospitals and surgery are associated cognitively with potential death (failure of the corporeal body). Therefore fear of failure may be an arousing stimulus for state anxiety in these situations. Additionally, fear of failure connotes impotence of self and a lack of cognitive awareness of appropriate coping skills with which to ameliorate the felt impotence. Izard and Tomkins (1966), who do not differentiate fear from anxiety, lend credence to the above discussion by saying,

Fear is the most constricting of all the affects. It can result in perceiving what is characterized as "tunnel vision," where the victim becomes functionally blind to a large proportion of the potential perceptual field. Fear greatly reduces behavioral alternatives. Fear is experienced as apprehension, uneasiness, uncertainty, insecurity. The person has the feeling that he lacks safety, a feeling of danger and impending disaster. He feels a threat to the existence of the person-he-is; this may be sensed as a threat to the body, the psychological self or both. (p. 107)

The curvilinear effect of anxiety, based on the research of Yerkes and Dodson, has been extensively studied and reported by Grinkler (1966). Moderate amounts of anxiety appear to be
facilitative of effective functioning and behavior; whereas, either very low or very high levels of anxiety contribute to ineffective, maladaptive functioning (Grinkler, 1966, p. 129). High levels of anxiety then seem to cause ineffectual behavior or coping attempts. As such attempts fail to relieve the affect of anxiety, the individual experiences increasing dependency, helplessness and impotency. Grinkler (1956) discusses also the circular spiraling effect of anxiety. Anxiety tends to become more intense (higher) if the initial attempts to reduce it prove ineffective. One might diagram this circular spiral: Anxiety $\rightarrow$ coping skills which are ineffective $\rightarrow$ increased helplessness $\rightarrow$ decreasingly effective coping skills $\rightarrow$ higher levels of anxiety.

Wolpe and Lazarus (1966) have contributed the principle of "reciprocal inhibition" (p. 12) to the understanding of anxiety relief. One primary result of their laboratory research with cats, and their clinical research with severe phobias of neurotic clients, is that the intensity of the affect of anxiety is reduced when the anxiety producing stimulus is temporally paired with a response antithetical to anxiety. One example of this phenomenon would be the pairing of a state of relaxation with the anxious state experienced in the presence of aversive stimuli. Jacobson's (1938) research indicates that states of relaxation are antithetical to the anxiety state.
Interrelatedness of Anxiety and Pain

The interrelated, unified theory of the mind and body, in contrast to the dualistic theory, has been historically developed by the thinking of Spinoza, Darwin, and Freud. Interrelatedness of mind and body phenomena speaks to the conceptualization of pain as having two discrete, but interrelated, components. One component being sensory and the second component being the organism's response to the sensory input; namely, distress or anxiety (emotionality). Darwin (1897) credits Herbert Spencer with theorizing that there is a "clear distinction between emotions and sensations, the latter being generated in our corporeal framework" (p. 27). Weisenberg (1975) defines the pain experience in a manner that addresses the interrelationship of the mind and body in pain: "Pain is a complex psychological phenomenon that includes cognitive, emotional, and affective components" (p. 2). Travelbee (1971) supports this interrelatedness of mind and body by her statement: "One aspect of the human organism can never be separated from the whole. Even though physical pain can be localized in one part of the body, in actuality the individual as a whole suffers, not just the body part" (p. 73).

Hardy, Wolff, and Goodell (1967) studied several variables to determine their effect on the pain reaction threshold. The results
indicated that:

The reaction threshold, as measured by the minimal intensity of thermal radiation which will evoke it, is more variable than the pain threshold and is more easily affected by analgesic drugs, hypnosis, laboratory conditions (room temperature), and the subjects' attitude and emotional state. Feelings of relative tranquility are associated with a rise in the reaction threshold, and inversely, feelings of anxiety are associated with a lowering. (Hardy, Wolff, & Goodell, 1967, p. 305)

The neurophysiological theory of pain as developed by Melzack and Wall (1975) is known as the "gate control theory." This recent theory has primarily replaced the earlier specificity and pattern pain theories in physiology. The "gate control theory" has as a core concept a physiological gate control system "which modulates sensory input from the skin before it evokes pain perception and response" (Melzack and Wall, 1975, p. 12). This theory has gained considerable substantiation and ongoing refinement from basic physiological research on the central nervous system. The model explores the relationship of anxiety and pain by hypothesizing that a sensory input or stimulus goes through a process of being "identified, evaluated in terms of prior experience, localized, and inhibited before the action system responsible for pain perception and response is activated" (Melzack and Wall, 1975, p. 18). Additionally, then, psychological factors such as "past experience, attention, and emotion influence pain response and perception by acting on the gate control system" (p. 18). A logical extension of this
theory is reflected in the contemporary research relative to pain which seeks to discover the effect of various treatment approaches on the motivational, affective, and cognitive dimensions of the pain experience.

Merskey (1975) reviews three primary psychological theories of pain: "pain as a consequence of hostility; pain as a means of communication; and pain as a consequence of a threat to the integrity of the body" (p. 30). Szasz (1957) has further developed the latter theory by postulating that the body is viewed by the ego as an object and pain arises when the self perceives threat to the body (p. 30). Szasz includes in his theory the concept of the communication of pain as a cry for help.

Beecher (1975) discusses the Marshall-Strong concept of pain. This concept proposes that suffering consists of two discreet components, the original sensation and the reactive component (p. 61). Beecher's research on the effect of placebos and Morphine indicates that placebos are 10 times more effective in relieving pain due to pathology than they are in relieving experimentally produced pain. The discussion lends support to the concept that in a disease state the amount of concomitant anxiety associated with pain is greater, and that relief is afforded when interventions address the anxiety component of the pain experience.
Measurement of Physiological Arousal

Many indicators of physiological arousal have been identified and are detailed by Cattell (1966). Physiological factors which Cattell (1966) found to be significantly related to anxiety include increase in systolic blood pressure, increase in heart rate, increase in respiratory rate, and other physiologic variables associated with general autonomic activity (p. 33). Focus of the literature review will be on the physiological indicator, digital sweating (also known as palmar sweating), chosen as the measure of anxiety used in this study. Lazarus and Opton (1966) discuss the problems attendant to the use of autonomic nervous system, behavioral, and self-report measures to infer the presence of anxiety. They conclude that each category of instrument measures different dimensions of a multi-dimensional concept (Lazarus & Opton, 1966, p. 235).

Kuno's (1956) research found that there is constant sweat secretion to the volar surface of the hand. Kuno states that, "any mental stress and emotional and sensory agents may increase the secretion, and the rate of secretion therefore greatly depends upon the psychical state of the subject" (p. 142). Kuno's research indicates that there are paradoxical effects on palmar sweating induced under extremes of environmental temperature, but that an increase
in body temperature, as measured by rectal temperature, has no such effects. "The peculiarity of sweating on the palms, soles, and in the axillae has been firmly established as being related to psychological and sensory processes rather than to body temperature regulation" (Hardy, Wolff, & Goodell, 1967, p. 263).

Haywood and Spielberger (1966) investigated individual differences in anxiety in 61 male undergraduate students, as measured by scores on the Taylor Manifest Anxiety scale and physiological arousal as measured by the Palmar-Sweat Index, photometric technique. The results indicate that palmar sweating is a "sensitive measure of autonomic arousal" (p. 104). Additionally, the researchers indicate that, "Even the mildly stimulating situation employed in this experiment (presumable anticipation of a simple verbal conditioning task) produced measurable differences in palmar sweating which moreover, were significantly related to anxiety" (p. 104).

The specific preparatory and administration procedure of the Digital Sweat Tape Band measure, used in the present study, is detailed in Chapter III.

Minckley (1974) used palmar sweating to measure the stress experienced by patients in response to early definite or late indefinite scheduling of surgery. She states that autonomic responses are "reliable in their appearance in relation to the syndrome
response to mental stress" (p. 400).

Dropleman and McNair (1971) tested the effect of a simulated public speaking situation on palmar sweating in 12 adult subjects. Palmar sweating of subjects was measured by sweat prints (physiological measure). Self-report ratings of emotional arousal were also obtained from the subjects. Anticipatory and actual stress period of public speaking resulted in significant differences on both the physiological and psychological measures of arousal, compared with non-stress periods.

Lipper and McNair (1972) conducted a study to investigate whether the arousal state indicated by increased palmar sweating in Dropleman and McNair's (1971) study might be specifically termed anxiety and differentiated from other aroused states. The attempt of this study was to investigate whether palmar sweating was specifically indicative of the emotional state of anxiety such that degree of palmar sweating might be used as an evaluative measure of the effectiveness of anti-anxiety treatment interventions. The results of this study indicate that, "Simulated public speaking induced anxiety as indicated by marked and significant elevations of both palmar sweating and subjective tension-anxiety ratings without increase in other aspects of subjective activation" (Lipper & McNair, 1972, p. 237). Therefore it appears that measures of palmar sweating are useful indicators of emotional
and motivational arousal as well as clinical anxiety.

McNair, Droopleman, and Kussman (1967) and Paul (1964) conducted a series of experiments to validate the use of digital sweat print tape bands to measure the amount of digital sweat. Their findings were that the simplified means (digital sweat bands) validly detected the physiological effect of an anticholinergic drug administered under double-blind experimental conditions.

FSP tape bands, thus, represent an acceptable alternative to other techniques for obtaining simple discrete measures of finger sweating. The technique has the definite advantage that it is useful in situations where for experimental or practical reasons the E does not wish to immobilize Ss during the measurement period. In view of their simplicity and minimal cost, the tape bands should prove more useful in group settings and in naturally occurring stress situations. (McNair, Droopleman, & Kussman, 1967, p. 78)

In another study Droopleman and McNair (1969) further established the parameters for use of the Finger Sweat Print Tape Bands. The results showed that finger contact with the tape band for periods of 0.5 to 3.0 minutes is a sensitive indicator of treatment effects (p. 663). Paul (1964) suggests that 90 seconds are required for a valid measure of palmar sweat using digital sweat print tape bands. Paul (1964) specified that 30 seconds drying time of the drying agent on the volar surface of the subject's finger is sufficient (p. 264).

Harrison, MacKinnon, and Monk-Jones (1962) state that palmar sweat as measured by the colormetric method is decreased

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at high altitudes, in pregnancy, during sleep, and just before and for 1 or 2 weeks after surgery depending on the sex. However, Minckley (1974) conducted a study on patients in the preoperative and postoperative phase which revealed opposite findings in regard to palmar sweating preoperatively and postoperatively. Using a perspiration meter especially designed for this study, the results were:

The palmar sweat values obtained in the postoperative period indicated that this variable fluctuated as much as pulse and blood pressure in the days following surgery, and did not remain at zero as Harrison et al. (1962) suggest. It is difficult to account for the fluctuation of palmar sweat on the basis of external stress stimuli, and it did not appear even to correspond with the patient's self report of anxiety. The fluctuation of palmar sweat might have been a corollary to the degree of discomfort or pain the patient experienced. (p. 398)

Theoretical and Clinical Basis for Development of the Nurse Intervention Treatment

The experimental Nursing Intervention Treatment, used for this study, included behaviors on the part of the nurse that were designed to ameliorate several dimensions of the postoperative experience that are anxiety producing as enumerated by nursing theorists, clinicians, and patients. Nursing intervention is appropriately designed to "alter factors that cause or increase the intensity of the patient's behavioral responses to pain. A realistic goal may be reduction of pain to a tolerable level or a lowering of

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anxiety preceding and following pain" (McCaffery, 1972, p. 78).

An examination of research studies and nursing practice literature reveals that specific behaviors may be used in nursing intervention to reduce patient pain and attendant anxiety. These may be summarized as follows and the basis for the use of each will be described in subsequent discussion. It is to be noted that the behaviors as presented were incorporated into this investigation as the experimental Nursing Intervention Treatment. The behaviors of the Nursing Intervention Treatment were designed to meet patient needs for: (1) recognition of personhood by care givers, (2) rapidity of response by care givers to an expressed need by the patient, (3) removal of noxious environmental stimuli, (4) explanation to allow patients the opportunity to develop realistic expectations and therefore increase situational predictability, (5) touch as it contributes to proximity of the care giver and the patient, and (6) facilitation of development of the nurse-patient relationship through active listening and verbal support of patients' coping skills to reduce helplessness. Efficacy for this approach is found in the following statement by Engle (1963):

In therapy the emotions are never observed in the pure state; and in the therapeutic process of attempting to alter disordered states, we do not in fact attempt to dissect all of the emotional components of a given state even if this were conceivable. We rather attempt to alter the state by centering our attention on one or another aspect of the emotional state which we feel to be

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especially crucial in the hope that this will therapeutically mobilize the entire state. (pp. 296-297)

Copp (1974), in a study designed to obtain patient responses when asked what physicians and nurses could do about patients' pain, found that recognition of personhood, rapidity of care givers response, and removal of noxious stimuli were considered important by patients. On this basis of testimony in Copp's study, each of these behaviors enumerated by patients was included in the experimental Nursing Intervention Treatment for the present study.

Travelbee (1971) indicates that a primary supportive intervention to reduce the anxiety attendant to the surgical experience is the giving of cognitive information. The individual needs to know what is and will be happening to him. Without such knowledge one is forced to autistically interpret and fantasize about the meaning of external events and situational happenings. Arising from this conceptualization is the hypothesis that "there is a direct relationship between the extent to which the individual's need for cognitive clarity and security are met and the individual's anxiety level" (Travelbee, 1971, p. 190). Darwin (1897) verbalizes this concept, "My will and reason were powerless against the imagination of a danger which had never been experienced" (p. 38). Staub, Tursky, and Schwartz (1975) report research which substantiates earlier findings "that control and predictability reduce tension and the
disruption of behavior produced by aversive stimuli" (p. 175). Therefore an explanation to allow patients the opportunity to develop realistic expectations to increase situational predictability was included in the experimental Nursing Intervention Treatment.

Among other prescribed behaviors noted to be effective in nursing intervention is the use of touch by the care giver. Touch may serve to physically reinforce the presence of another person, who, by remaining with the patient in pain, signifies to him recognition and acceptance of the validity of his pain. McCorkle (1974) cites Clark's statement that: "By touching a patient, the nurse may convey to him that he is not alone--that she is there, that she has time to listen, and that she will exert every effort to make him as comfortable as possible" (p. 125). Additionally, touch may serve as a distractor in that it offers sensory input which is an alternative to that sensory input offered by the pain. Also touch of a massaging, repetitive nature, such as a backrub, may promote a generalized state of increased relaxation.

McCorkle (1974) conducted a study on the effects of touch on seriously ill patients. The findings support the use of touch as an indicator to patients that the nurse cares about the patient. Fisher's (1977) research found "that anxiety can be reduced if a nurse touches a patient's arm or shoulder during presurgery counseling" (p. B-6).
The gate control theory of pain also proposes that the use of touch, as it stimulates large-diameter, cutaneous, afferent nerves on the surface of the skin, is a means of "closing the gate to impulses entering the spinal cord" (Siegele, 1974, p. 499). Siegele (1974) states "the gate control theory re-establishes the value of touching, backrubs, scratching, moderate massage, and the application of menthol rubbing agents" (p. 502). Therefore, touch, in the form of a 2-3 minute backrub, was included as a behavior in the experimental Nursing Intervention Treatment.

Titchener (1960) speaks to the need for supportive measures to decrease the stress which a weakened physical condition places upon the individual's psychological adaptation abilities. Titchener (1960) states that this cycle may be positively affected by "emotionally supportive techniques, which replenish the patient's own resources and bolster his mechanisms of defense" (p. 257).

The concept of powerlessness is also relevant in supporting nursing intervention designed to attend the patient to his previously successful coping mechanisms in response to pain. McCaffery (1972) cites the definition of powerlessness, developed by Seeman and Evans, as "the individual's feeling that his behavior cannot determine the outcomes or the reinforcements he seeks" (p. 59). Therefore the reduction of feelings of powerlessness by focusing the patient's attention on his previously successful pain coping...
skills would appear to be a viable means of reducing the anxiety which may accompany dependency and helplessness. Darwin (1897) states, "If we expect to suffer we are anxious; if we have no hope of relief we despair" (p. 176). The concept of classical conditioning also offers support to the reinforcement of previously successful pain coping mechanisms. This dimension of care giving was incorporated into the experimental Nursing Treatment Intervention by having the nurse encourage the patient to verbalize his previously successful pain coping skills. Also, the nurse behavior was to verbally reinforce those patient pain coping skills appropriate during the postoperative pain experience.

**Hypotheses**

This study then proposed to investigate the following theoretical hypotheses.

**Hypothesis 1:** Anxiety during the 72 hour postoperative period is less for subjects in the experimental group than for subjects in the control group.

**Hypothesis 2:** The amount of analgesic medication is less for subjects in the experimental group than for subjects in the control group.

**Hypothesis 3:** Postoperative recovery rate as measured by mean postoperative body temperature, mean number of ambulatory
efforts, and mean number of analgesic medications administered is greater for subjects in the experimental group than for subjects in the control group.

Level of preoperative anxiety and level of preoperative life stress will have an interactive effect with the treatment such that:

**Hypothesis 4:** The difference in the anxiety during the 72 hour postoperative period between the experimental group subjects with high levels of preoperative anxiety and those with low levels of preoperative anxiety is less than the same difference for the control group subjects.

**Hypothesis 5:** The difference in the anxiety during the 72 hour postoperative period between the experimental group subjects with high life stress scores and those with low life stress scores is less than the same difference for the control group subjects.
CHAPTER III

DESIGN AND PROCEDURES

Subjects and Setting

The sample consisted of a total of 36 adult patients, 18 years of age or older, admitted for general abdominal surgery to one of two hospitals in the Kalamazoo area. General abdominal surgery was defined as those procedures which necessitated an opening into the abdominal wall. Table 1 details the specific types of surgery undergone by subjects in this study.

Table 1

Type of Surgery

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>No. of Control Subjects</th>
<th>No. of Experimental Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal Hysterectomy</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Exploratory Laparotomy</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Marshall Marchette Procedure</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

N = 18 N = 18
Eighteen subjects were identified from Hospital I and assigned to the experimental group. Eighteen subjects were identified from Hospital II and assigned to the control group.

Subjects were selected from the operating room schedules during a 4-month period from February, 1977, through May, 1977. The subjects were consecutively selected as they appeared on the operating room schedule. Of the total number scheduled in this manner, approximately four subjects were not included in the study because of investigator schedule constraints.

Subject anonymity was maintained by use of a code number which consisted of the subject's first initial, last initial, and birthdate.

Subjects were excluded from the study who exhibited unusual or atypical psychological or physical histories. Specifically, subjects with altered levels of consciousness, significantly altered levels of mobility, emergency conditions necessitating the surgery, significant auditory or visual impairment, documented allergy history, and documented abuse of analgesics were excluded from the sample.

Demographic data on each subject was obtained from the patient's medical record by the investigator. The demographic information obtained was (see Appendix A):

1. Age
2. Sex
3. Height and weight
4. Number of previous surgical procedures
5. Date of most recent previous surgery
6. Physician's name
7. Preoperative temperature, pulse, respiration, and blood pressure
8. Hospital admission date
9. Surgery date and time
10. Present surgery
11. Preoperative medication
12. Anaesthetic
13. Postoperative pain medication

The two hospitals selected for this study were chosen on the basis of geographical proximity to Kalamazoo, size and stability of staff, and similarity of: (1) educational preparation of nursing staff, (2) types of auxiliary personnel used to administer patient care, and (3) patient population served by the hospitals. Three hospitals were initially contacted by the investigator to assess their interest in participation in the study. Two of the three hospitals contacted agreed to participate. One was designated as Hospital I (Experimental Hospital) and the second was designated as Hospital II (Control Hospital). The decision to participate in the study
was made by the Nursing Director of each hospital after presentation of an abstract of the proposed study and after consultation with the hospital nursing staff. Final approval for implementation of the study was sought and granted by the Medical Staff of each hospital.

Experimental and Data Collection Procedures

Each subject was contacted in his hospital room by the investigator on the day before the scheduled surgery to seek his written permission for participation in the study (see Appendix B). The investigator identified herself as a nurse who was conducting a study which had received prior approval of the Nursing and Medical staff of the hospital. The nature of the study was verbally explained to the patient by the investigator. The explanation given was, "This study is being conducted to gain information about your responses after surgery which may be of some help to us in learning more about nursing care." All patient questions were answered truthfully and as completely as possible at this time. All potential subjects who were contacted agreed to participate.

The following is a detailed temporal sequence of events scheduled for the experimental procedure and data collection phases:

1. Late afternoon or early evening of day before surgery
   1.1 Obtain subject's written permission to participate.
   1.2 Obtain initial presurgery Digital Sweat measure.
1.3 Administer Schedule of Recent Experience Questionnaire.

1.4 Administer the presurgery questions (5) of the Structured Interview Questionnaire.

2. One-half hour before surgery and before preoperative medication is administered

2.1 Obtain a Digital Sweat measure.

3. Subject undergoes surgery.

4. First 72 hours postoperatively and for each pain experience

4.1 Complaint of pain communicated by subject.

4.2 Administer medication ordered for pain.

4.3 Obtain Digital Sweat measure within 5 minutes of administration of medication.¹

4.4 Carry out sequential steps of Nursing Intervention Treatment. (Detailed on page 39 and in Appendix C.)

5. Seventy-two hours after surgery

5.1 Administer remaining 16 questions of the Structured Interview Questionnaire (Appendix D).

5.2 Obtain demographic data from subject's medical chart.

¹Originally the Digital Sweat Measure was also to have been obtained one-half hour after the Nursing Intervention Treatment was administered. Early in the experiment, it became necessary to abandon this second Digital Sweat measure because of the Nursing staff's refusal to disturb the patient who, by this time, was frequently asleep as a response to the somnolent effect of the pain medication; namely, Demerol and Morphine Sulfate. Inasmuch as a state of sleep is recognized as the most definitive example of a state of ataraxy, the decision not to attempt to obtain a second Digital Sweat measure was deemed justified in response to patient needs for rest and recovery from surgical insult.
5.3 Obtain recovery indices (postoperative temperature, number of pain medications received in first 72 hours, number of ambulatory efforts made by subject during the first 72 hours postoperatively) from subject's medical chart.

Instrumentation

**Independent Experimental Variable**

The experimental treatment was the Nursing Intervention Treatment which consisted of the following sequential behaviors on the part of the nurse:

1. The patient is called by name and the nurse introduces herself to the patient upon his return to the unit from the recovery room.

2. The patient is told that he has a medication ordered for pain and the time schedule by which this medication may be administered.

3. When the patient expresses that he is in pain, the procedure adhered to is as follows:

   3.1 The nurse encourages the patient to describe and locate the pain.

   3.2 The ordered analgesic is given within 5 minutes. (If the time contingencies prohibit this, the nurse so informs the patient that the medication will be given at the first allowable time and proceeds with the remainder of the steps of the procedure).

   3.3 The patient is given a 2-3 minute backrub and repositioned for comfort.

   3.4 Linens are checked for soiling, wetness, wrinkling, and changed or straightened.
3.5 The opportunity to void is offered.

3.6 The dressing is observed, changed or reinforced if necessary, and a verbal report on its condition is given to the patient.

3.7 The intravenous infusion, naso-gastric suction, catheter, if present, are observed and a report on their functioning is given to the patient.

3.8 The nurse sits quietly with the patient, eliciting and responding to the patient's verbalizations. During this time she asks the patient about his usual ways of dealing with pain, and reinforces and encourages his present use of those pain coping skills which are appropriate in this situation.

Each member of the nursing and nursing auxiliary staff in the Experimental Hospital were trained in the steps of this procedure by the investigator. Small groups of staff were trained in approximately 6 one-half hour sessions consisting of two sessions with each of the three standard shifts of personnel. Opportunities to clarify, question, and become familiar with each step of the procedure were offered. To provide for visual reminders and review of the Nursing Intervention Treatment, a copy of it was placed on a clipboard on the foot of each subject's bed. To insure that the treatment was maintained for each subject, each person carrying out the treatment was required to chart each step on a Record of Nursing Intervention Treatment (Appendix E). This charting record was also clipped to the foot of the subject's bed. In addition, red tags were attached to the foot of each subject's bed, to the front of
each subject's chart, and to the medication Kardex of each subject, labeling that this person was a subject in the Nursing Research Study.

The Nursing Intervention Treatment was carried out each time the subject communicated that he was in pain for the first 72 hours postoperatively. This period was defined as beginning with the onset of surgery and ending 72 hours later.

The nursing staff in the Control Hospital were told that the study was being conducted to learn more about patient's reactions after surgery. They received no information about the Nursing Intervention Treatment. Informal observation carried out on a random observation basis demonstrated that a prompt response of medication administration occurred. However, a minimal likelihood existed that any routine nursing intervention used would realistically approximate the high degree of structure and consistency involved in the experimental Nursing Intervention Treatment.

**Dependent Variables**

**Anxiety Measure--Digital Sweat Index.** In both the Control and Experimental Hospitals the nursing staff was trained by the investigator in the procedure to obtain the Digital Sweat Print. A demonstration of the procedure was given in small groups of approximately six to eight staff. Staff were encouraged to give a
proficiency demonstration of the procedure, handle the equipment, and seek clarification of any questions. A written step-by-step procedure for obtaining the Digital Sweat Measure was attached to a clipboard at the foot of each subject’s bed (Appendix F).

The Digital Sweat instrument measures the level of state anxiety. The procedure followed was one recommended by McNair, Droppleman, and Kussman (1967). The specific procedure was communicated in writing by the Psychological Clinic at the University of Tennessee (Appendix G).

In general, the procedure consists of four primary steps. First, the paper strips are prepared using Tannic Acid, Thymol, and distilled water. Second, the Ferric Chloride (drying solution) Solution is prepared using Ferric Chloride, Hydrochloric Acid, and Acetone. Third, the actual finger sweat prints are obtained. Fourth, the prints are rated using a photograph of density of print, scaled from 1 to 15 with 1 being least dense to 15 being most dense.

The Tannic Acid Solution was prepared in the following manner. Distilled water in the amount of 1000 cc was placed in a pyrex flask. To the distilled water was added 50 grams of Tannic Acid and 1 gram of Thymol. The mixture was heated gently with constant mechanical stirring. When the ingredients were in solution, the solution was filtered into an opaque, brown bottle and stoppered. This solution was stored under refrigeration for the duration of the
experiment.

The paper strips were prepared by cutting Whatman Filter paper into 1 inch wide strips. New stainless steel scissors were used and plastic gloves were worn during all aspects of preparation of the paper strips. The strips were then cut into 11 inch lengths and placed four at a time into the bottom of an 8 x 11 inch pyrex baking dish. Just enough Tannic Acid Solution was poured on the strips to cover them completely. No overlapping of strips was allowed to occur. The strips were soaked for 3 minutes; removed from the dish; excess Tannic Acid Solution was removed by gently shaking; and the strips were placed on a clean formica counter to dry. After about 10 minutes drying time, the strips were moved to a clean, dry spot on the formica counter and allowed to dry completely (approximately 1 hour, depending on the atmospheric humidity level).

Again using plastic gloves and steel scissors, the strips were cut into approximately 1 x 2 inch lengths. Plastic splints of 1 x 2 x 1/16 inch size were cut from 1 inch diameter plastic tubing. These splints were flexible and adapted to any reasonable finger size by attaching them to the finger with a small rubber band.

The Ferric Chloride Solution (drying solution) was prepared using 13 grams of Anhydrous Ferric Chloride, 3 drops of hydrochloric acid, and 1 pint of Acetone. This solution was stirred,
without heating, until all ingredients were in solution. Then the
dsolution was filtered into an opaque glass container. Small indi-
vidual opaque glass containers were used to store the Ferric
Chloride Solution in the subjects medicine box for the 72 hour dura-
tion of the experiment.  

The Digital Sweat measure was taken on the middle finger of
the right hand of all subjects. The distal part of the finger was
swabbed by means of a Q-tip with the Ferric Chloride Solution and
it was allowed to dry for 30 seconds. Then the plastic splint with
a paper strip inserted was attached to the finger with a rubber band
and allowed to remain in place for 60 seconds.

The completed strips were then removed and placed in
glassine envelopes which were labeled with the subject’s name,
date, and time taken. The Digital Sweat prints were scored by
three raters, trained by the investigator, using the procedure
detailed by the Psychological Clinic at the University of Tennessee
(Droppleman, 1973). (See Appendix G.) The prints were rated
under the same environmental and lighting conditions for all rating
sessions, and using the photograph of finger prints numbered from
1 to 15 (Appendix H).

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²The assistance of Mr. James Stewart, Director of Chemis-
try Stores, Western Michigan University, in the obtaining and
preparation of the necessary solutions and equipment, is grate-
fully appreciated.
This measure was obtained for each subject on three occasions: (1) on the day preceding surgery, (2) on the day of surgery, just preceding the administration of the preoperative medication, and (3) within 5 minutes after the administration of each analgesic medication for pain during the first 72 hours postoperatively.

**Life Stress Measure--Schedule of Recent Experience.** This scale measures the amount of life stress to which an individual has been subjected because of significant changes in his life (Rahe, 1974, p. 67). This scale (Appendix I) has been devised by Rahe to be used in his research on the prediction of future illness by retrospectively examining and identifying significant life event stressors (Rahe, 1972, 1974, 1975). The events that this questionnaire seeks to identify are both positive and negative events, but all represent some inferred change or adaptation in the subject's life. While the use of this measure for purposes of this present study differs somewhat from the predictive use for which it was originally devised, nevertheless, it appears to have content validity for detailing common life stresses experienced by adults in present American society.

Each potential stress event has a numerical value called the Life Change Unit. For purposes of this present study, the Life Change Units circled by the subject as having happened in his life in the year immediately preceding surgery were simply summed.
A median Life Change Score for all subjects (N = 36) was obtained. Those subjects above the median were placed in the High Stress Group, and those subjects below the median were placed in the Low Stress Group for purposes of data analysis.  

This measure was administered by the investigator on the day of the subject's admission to the hospital at a time, in the late afternoon or early evening, that was determined to be mutually convenient to subject and staff. The subject was instructed to circle the numbers which corresponded with events he had experienced in his life in the year preceding surgery. 

Subject's self-report of postoperative pain experience--

Structured Interview Questionnaire. The Structured Interview Questionnaire was designed by the investigator and consisted of a total of 21 questions (Appendix D). Answers to the first five questions were sought during the first investigator-subject contact on the day preceding surgery. These questions were designed to obtain the subject's self-report of the following: (1) his present state of emotionality, (2) his self-report of causative factors for his present state, and (3) what he and others had done in the immediate preadmission period to either increase or decrease the level

---

3Permission to use and reproduce the Life Change Events Questionnaire was sought and granted by Richard H. Rahe, Captain, MC, USNR (Appendices M and N).
of emotionality he was experiencing.

The final 16 questions of the Structured Interview Questionnaire were asked on the fourth postoperative day. These questions were designed to obtain self-report information on the following dimensions of the postoperative pain experience: (1) degree of emotionality experienced after surgery, (2) factors perceived as influencing the degree of felt emotionality, (3) subject's attempts to alter his level of emotionality, (4) subject's perception of the effect of other persons influence on his level of emotionality, (5) amount of pain experienced postoperatively, (6) concomitant emotionality experienced during the pain situation, and (7) actions of others which were perceived by the subject to ameliorate or exacerbate his pain experience.

The results of the questionnaire were analyzed by simply summing and reporting the responses of subjects to each question.

Recovery rate indices—postoperative body temperature, number of pain medications received, number of ambulatory efforts. The measures used in this study, which were presumed to be indicative of recovery rate, were those which have been used by other researchers (Andrew, 1970; Cohen & Lazarus, 1975; Minckley, 1974; Sime, 1976; Wolfer & Davis, 1975).

Body temperature was obtained from the subject's medical chart. The mean body temperature for three postoperative periods
was obtained: first 24 hours (1 - 24 hours postoperatively), second 24 hours (24 - 48 hours postoperatively), and third 24 hours (48 - 72 hours postoperatively).

The number of analgesic medications received was obtained from the subject's medical chart. The mean number of analgesics for each of three periods was found: first 24 hours (1 - 24 hours postoperatively), second 24 hours (24 - 48 hours postoperatively), third 24 hours (48 - 72 hours postoperatively).

The number of ambulatory efforts was proposed to be obtained from the subject's chart. This recovery rate index was not used in the analysis of data for this study for the following reasons. The number of ambulatory efforts during the period of 1 to 24 hours after surgery is largely determined by specific physician orders to that effect. In the Experimental Hospital the physician's orders usually included orders for patient ambulation during the first 24 hour period postoperatively; such was not the case in the Control Hospital. Therefore the measure lost its value as a discriminating variable between Experimental and Control groups. Additionally, it was originally proposed to obtain this data from the subject's medical chart and whether this activity was charted, in the Nursing Notes of the Medical Record, varied considerably, depending upon who was charting for the period of time specified. This latter factor was especially true for the third 24 hour postoperative period.
when many of the subjects were up and about independently in their room and halls without the Nursing staff observing them during each ambulatory effort.

Data Analysis Plan

Specifically, the following statistical analyses were completed in testing the null hypotheses using a probability of .05 for committing a Type I error (alpha):

Hypothesis 1: A fixed effects, one factor analysis of variance between the control and experimental groups on the dependent variable of mean anxiety level during the first 72 hours postoperatively.

Hypothesis 2: A fixed effects, one factor analysis of variance between the control and experimental groups on the dependent variable of mean number of analgesic medications (a recovery rate index) administered during the first 72 hours postoperatively.

Hypothesis 3: A fixed effects, one factor analysis of variance between the control and experimental groups on the dependent variable of mean body temperature (a recovery rate index) during the first 72 hours postoperatively.

Hypothesis 4: A fixed effects, two factor analysis of variance on the interactive effect of preoperative anxiety level with the experimental treatment on the dependent variable of mean anxiety level during the first 72 hours postoperatively.
**Hypothesis 5:** A fixed effects, two factor analysis of variance on the interactive effect of previous life stress with the experimental treatment on the dependent variable of mean anxiety during the first 72 hours postoperatively.
CHAPTER IV

RESULTS

The data analysis consisted of four sections: (1) analysis of the five main hypotheses, (2) analysis of the inter-rater reliability for the Digital Sweat measure, (3) post hoc analyses of data that were generated by additional insights and questions posed by the analysis of data relative to the five major hypotheses, and (4) analysis of the results of the Structured Interview Questionnaire.

Analysis of Major Hypotheses

Hypothesis 1

Anxiety during the 72 hour postoperative period is less for subjects in the experimental group than for subjects in the control group.

For the purpose of testing whether the experimental treatment affected postoperative anxiety levels, the data analyses for Hypothesis 1 were divided into the following four components:

1. The effect of the experimental treatment on the mean anxiety level during the first 24 hour period postoperatively (hours 1 - 24).

2. The effect of the experimental treatment on the mean anxiety level during the second 24 hour period
postoperatively (hours 24 - 48).

3. The effect of the experimental treatment on the mean anxiety level during the third 24 hour period postoperatively (hours 48 - 72).

4. The effect of the experimental treatment on the mean anxiety level during the total 72 hour period postoperatively (hours 1 - 72).

A fixed effects, one factor analysis of variance model was used to test each of the above components.

Effect of experimental treatment on mean anxiety, hours 1 - 24 postoperatively. From Table 2 one can infer that there was no significant difference between the experimental and control groups on mean anxiety level during the first 24 hour period postoperatively (hours 1 - 24).

For an alpha of .05, the required critical value of $F$ for 1 and 33 degrees of freedom is approximately 4.17, so that the obtained $F$ value of .04 is not significant at the .05 level. Therefore no evidence is found to reject the null hypothesis of no difference between groups. The dependent variable, mean level of anxiety in the first 24 hour period postoperatively, is not significantly affected by the experimental treatment (Nursing Intervention Treatment) based on the present results.

Effect of experimental treatment on mean anxiety, hours 24 - 48 postoperatively. From Table 3 one may infer that there was no significant difference between the experimental and control
Table 2
Summary of One Factor Analysis of Variance for Mean Anxiety Level for Postoperative Period, Hours 1 - 24

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>17</td>
<td>3.03</td>
<td>1.84</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>3.15</td>
<td>1.66</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>0.13</td>
<td>0.04</td>
<td>0.84</td>
</tr>
<tr>
<td>Within Groups</td>
<td>33</td>
<td>3.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

groups on mean anxiety level during the second 24 hour period postoperatively (hours 24 - 48).

For an alpha of .05, the required critical value for $F$ for 1 and 33 degrees of freedom is approximately 4.17, so that the obtained $F$ value of .45 is not significant at the .05 level. The null hypothesis of no significant treatment difference is not rejected. These results show that the mean level of anxiety in the second 24 hour period postoperatively is not significantly affected by the experimental Nursing Intervention Treatment.
Table 3

Summary of One Factor Analysis of Variance for Mean Anxiety Level for Postoperative Period, Hours 24 - 48

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>17</td>
<td>4.25</td>
<td>3.04</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>3.66</td>
<td>2.18</td>
</tr>
</tbody>
</table>

<table>
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<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>3.09</td>
<td>0.45</td>
<td>0.51</td>
</tr>
<tr>
<td>Within Groups</td>
<td>33</td>
<td>6.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effect of experimental treatment on mean anxiety, hours 48 - 72 postoperatively. From Table 4 one may infer that there was no significant difference between the experimental and control groups on mean anxiety level during the third 24 hour period postoperatively (hours 48 - 72).

For an alpha of .05, the required critical value of $F$ for 1 and 27 degrees of freedom is 4.21, so that the obtained $F$ value of .30 is not significant at the .05 level. The null hypothesis of no significant difference between the experimental and control groups is not rejected.
Table 4

Summary of One Factor Analysis of Variance
for Mean Anxiety Level for Postoperative Period, Hours 48 - 72

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>14</td>
<td>3.46</td>
<td>2.50</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>15</td>
<td>3.01</td>
<td>1.94</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>1.51</td>
<td>0.30</td>
<td>0.59</td>
</tr>
<tr>
<td>Within Groups</td>
<td>27</td>
<td>4.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effect of experimental treatment on mean anxiety, hours 1 - 72 postoperatively. From Table 5 one may infer, as might be expected from the results reported above, there was no significant difference between the experimental and control groups on mean anxiety level during the total 72 hour period postoperatively.

The critical value of $F$ for 1 and 34 degrees of freedom, setting alpha at .05, is approximately 1.38, so that the obtained $F$ value of .02 is not significant. The null hypothesis of no significant difference between experimental and control groups is not rejected.
Table 5

Summary of One Factor Analysis of Variance for Mean Anxiety Level for Postoperative Period, Hours 1 - 72

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>9.57</td>
<td>6.02</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>9.32</td>
<td>4.00</td>
</tr>
</tbody>
</table>

<table>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>0.58</td>
<td>0.02</td>
<td>0.88</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>26.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 2

The amount of analgesic medication is less for subjects in the experimental group than for subjects in the control group. The data analysis for Hypothesis 2 was divided into the following four components. The effect of the experimental treatment on the number of analgesic medications received:

1. During the first 24 hours postoperatively, hours 1 - 24.

2. During the second 24 hours postoperatively, hours 24 - 48.
3. During the third 24 hours postoperatively, hours 48 - 72.

4. During the total 72 hours postoperatively, hours 1 - 72.

Tables 6, 7, 8, and 9 show the results of the fixed effects, one factor analysis of variance model that was used to test the number of analgesic medications administered in each of the three 24 hour periods postoperatively, and for the total 72 hour postoperative period.

Table 6

Summary of One Factor Analysis of Variance for Number of Analgesics Administered Postoperatively, Hours 1 - 24

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>3.83</td>
<td>1.50</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>3.28</td>
<td>0.96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
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<th>MS</th>
<th>F</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>2.78</td>
<td>1.74</td>
<td>0.20</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>1.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7
Summary of One Factor Analysis of Variance
for Number of Analgesics Administered
Postoperatively, Hours 24 - 48

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>3.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>3.72</td>
<td>1.36</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>4.69</td>
<td>2.29</td>
<td>0.14</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>2.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 8

Summary of One Factor Analysis of Variance
for Number of Analgesics Administered
Postoperatively, Hours 48 - 72

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>2.28</td>
<td>1.41</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>2.67</td>
<td>1.37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>1.36</td>
<td>0.70</td>
<td>0.41</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>1.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
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<td></td>
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</tbody>
</table>

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Table 9

Summary of One Factor Analysis of Variance for Number of Analgesics Administered Postoperatively, Total 72 Hours

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>9.11</td>
<td>3.82</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>9.67</td>
<td>2.70</td>
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</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>2.78</td>
<td>0.25</td>
<td>0.62</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>10.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For an alpha of .05, the required critical value of $F$ for 1 and 34 degrees of freedom is approximately 4.17, therefore none of the $F$ values in Tables 6, 7, 8, and 9 are significant. Hypothesis 2 is not supported by this data and the null hypothesis is not rejected.

**Hypothesis 3**

Postoperative recovery rate as measured by mean postoperative body temperature, mean number of ambulatory efforts, and mean number of analgesic medications administered is greater for
subjects in the experimental group than for subjects in the control group.

To determine whether the experimental treatment significantly affected postoperative recovery rate, data analysis was carried out for each separate index measure as follows: (1) body temperature, (2) ambulatory efforts, and (3) number of analgesic medications.

**Effect of experimental treatment on mean body temperature postoperatively.** The effect of the experimental treatment on mean body temperature was divided into three components for data analysis:

1. Mean body temperature for the first 24 hours postoperatively (hours 1 - 24).

2. Mean body temperature for the second 24 hours postoperatively (hours 24 - 48).

3. Mean body temperature for the third 24 hours postoperatively (hours 48 - 72).

The results of the fixed effects, one factor analysis of variance model that was used to test mean body temperature in each of the three 24 hour periods postoperatively are reported in Tables 10, 11, and 12.

For an alpha of .05, the required critical value of $F$ for 1 and 34 degrees of freedom is approximately 4.17, therefore none of the $F$ values in Tables 10, 11, and 12 are significant. The results of this study show that the experimental treatment did not significantly
affect the recovery index of mean postoperative body temperature.

Table 10

Summary of One Factor Analysis of Variance for
Mean Body Temperature for Postoperative
Period, Hours 1 - 24

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>98.89</td>
<td>0.81</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>98.97</td>
<td>0.69</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>0.05</td>
<td>0.09</td>
<td>0.77</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 11

Summary of One Factor Analysis of Variance for Mean Body Temperature for Postoperative Period, Hours 24 - 48

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>99.51</td>
<td>0.55</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>99.38</td>
<td>0.58</td>
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<table>
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<th>F</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>0.15</td>
<td>0.46</td>
<td>0.50</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
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<td></td>
<td></td>
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</tbody>
</table>

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Table 12

Summary of One Factor Analysis of Variance for Mean Body Temperature for Postoperative Period, Hours 48 - 72

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>99.46</td>
<td>0.76</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>18</td>
<td>99.03</td>
<td>0.58</td>
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<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>1.64</td>
<td>3.59</td>
<td>0.07</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Effect of experimental treatment on number of ambulatory efforts postoperatively.** This recovery rate index was not used in the analysis of data for this study for the following reasons. The number of ambulatory efforts during the period of 1 to 24 hours after surgery is largely determined by specific physician orders to that effect. In the Experimental Hospital the physician's orders ordinarily required patient ambulation during the first 24 hour period postoperatively; such was not the case in the Control Hospital. These differential hospital practices resulted in the measure losing
its value as a discriminating variable between experimental and control groups. Additionally, it was originally proposed to obtain this datum from the subject's medical chart and whether this activity was charted, in the Nursing Notes of the Medical Record, varied considerably, depending upon who was charting for the period of time specified. This latter factor was especially true for the third 24 hour postoperative period when many of the subjects were up and about independently in their room and the halls without the nursing staff observing them during each ambulatory effort.

Effect of experimental treatment on number of analgesic medications administered postoperatively. The effect of the experimental treatment on the recovery rate index, number of analgesic medications administered postoperatively, was tested using a fixed effects, one factor analysis of variance model. The results of this analysis are detailed in Tables 6, 7, 8, and 9. No significant results were obtained in these analyses. Therefore the experimental treatment, Nursing Intervention Treatment, did not significantly affect the recovery rate index of number of analgesic medications administered postoperatively.

None of the recovery rate indices used in this study were supported by the data. Therefore Hypothesis 3 is not supported and the null hypothesis is not rejected.
Hypothesis 4

The difference in the anxiety during the 72 hour postoperative period between the experimental group subjects with high levels of preoperative anxiety and those with low levels of preoperative anxiety is less than the same difference for the control group subjects.

For the purpose of testing the interactive effect of the level of preoperative anxiety, the evening before surgery, and the experimental treatment, Nursing Intervention Treatment, on mean postoperative anxiety level for the total 72 hour period postoperatively, a two factor analysis of variance model was used. Preoperative anxiety levels were divided into High and Low anxiety by considering anxiety values above the median (8.33) to be High and those below the median to be Low. Table 13 summarizes the results of the two factor analysis of variance model used to test Hypothesis 4.

For an alpha of .05, the required critical value of $F$ for 1 and 31 degrees of freedom is approximately 4.17. Therefore the data do not support Hypothesis 4 and the null hypothesis of no significant difference is not rejected.
Table 13
Summary of Two Factor Analysis of Variance for Effect of Level of Preoperative Anxiety and Experimental Treatment on Mean Postoperative Anxiety Level, Hours 1 - 72

<table>
<thead>
<tr>
<th>Level of Preoperative Anxiety</th>
<th>Experimental Group</th>
<th>Comparison Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>High Preoperative Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>M</td>
<td>10.08</td>
<td>9.06</td>
</tr>
<tr>
<td>SD</td>
<td>7.36</td>
<td>4.71</td>
</tr>
<tr>
<td>Low Preoperative Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>M</td>
<td>7.99</td>
<td>10.60</td>
</tr>
<tr>
<td>SD</td>
<td>4.19</td>
<td>3.87</td>
</tr>
</tbody>
</table>

Source of Variance

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Between Groups (Structured and Unstructured Nursing Treatment)</td>
<td>1</td>
<td>0.42</td>
<td>0.02</td>
<td>0.90</td>
</tr>
<tr>
<td>(B) Between High and Low Admission Anxiety</td>
<td>1</td>
<td>4.84</td>
<td>0.18</td>
<td>0.68</td>
</tr>
<tr>
<td>A x B Interaction</td>
<td>1</td>
<td>28.71</td>
<td>1.04</td>
<td>0.32</td>
</tr>
<tr>
<td>Within</td>
<td>31</td>
<td>27.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis 5

The difference in the anxiety during the 72 hour postoperative period between the experimental group subjects with high life stress scores and those with low life stress scores is less than the same difference for the control group subjects.

For the purpose of testing the interactive effect of level of previous life stress and the experimental treatment on mean postoperative anxiety level for the total 72 hour postoperative period, a two factor analysis of variance model was used. High and Low levels of previous life stress were determined by establishing the median and calling all life stress values above the median, High, and all life stress values below the median, Low. Table 14 summarizes the results of the two factor analysis of variance model used to test Hypothesis 5.

For an alpha of .05, the required critical value of $F$ for 1 and 31 degrees of freedom is approximately 4.17. The data do not support Hypothesis 5 and the null hypothesis is not rejected.

In summary, the data supported none of the five major hypotheses. Discussion of these findings will be considered in Chapter V.
Table 14

Summary of Two Factor Analysis of Variance for Effect of Amount of Previous Life Stress and Experimental Treatment on Total Postoperative Mean Anxiety Level

<table>
<thead>
<tr>
<th>Level of Previous Life Stress</th>
<th>Experimental Group</th>
<th>Comparison Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>High Previous Life Stress:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>M</td>
<td>10.61</td>
<td>9.17</td>
</tr>
<tr>
<td>SD</td>
<td>6.24</td>
<td>6.14</td>
</tr>
<tr>
<td>Low Previous Life Stress:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>M</td>
<td>9.68</td>
<td>8.36</td>
</tr>
<tr>
<td>SD</td>
<td>3.86</td>
<td>5.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Between Groups (Structured and Unstructured Nursing Treatment)</td>
<td>1</td>
<td>5.08</td>
<td>0.18</td>
<td>0.69</td>
</tr>
<tr>
<td>(B) Between High and Low Previous Life Stress</td>
<td>1</td>
<td>12.83</td>
<td>0.45</td>
<td>0.50</td>
</tr>
<tr>
<td>A x B Interaction</td>
<td>1</td>
<td>0.02</td>
<td>0.00</td>
<td>0.98</td>
</tr>
<tr>
<td>Within</td>
<td>31</td>
<td>28.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Inter-rater Correlation of Raters on Digital Sweat Prints

All of the sweat prints obtained from each administration of the Digital Sweat Print Measure were rated by the same three raters from a standard photograph of sweat prints (Appendix H). The prints were rated under the same environmental and lighting conditions for all rating sessions. Two raters (R1 and R2) rated the prints at the end of each 24 hour period. The third rater (R3), because of schedule constraints, rated the prints from 2 to 4 weeks later than R1 and R2.

Inter-rater correlations were found to be .98 between R1 and R2, .96 between R1 and R3, and .97 between R2 and R3. All of these values are significant (p < .01). Paul's (1964) data suggest that the digital sweat prints may darken over time. The significant correlations of the ratings of R3 with the ratings of R1 and R2 indicate that such darkening of prints was not found to occur in the present study.

Additional Post Hoc Data Analyses

The following additional analyses were conducted in an attempt to provide evidence that would support or more conclusively refute the five main hypotheses of the study.

A fixed effects, one factor analysis of variance model was

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used to determine if a significant initial difference existed between the experimental and control groups prior to experimental treatment as to the level of admission anxiety and the level of immediate preoperative anxiety. Tables 15 and 16 present summaries of this analysis. As is evident from a review of these tables, none of these results were significant at the .05 level for 1 and 33 degrees of freedom for differences between the experimental and control groups on levels of preoperative anxiety.

Table 15

Summary of One Factor Analysis of Variance for Differences Between Experimental and Control Groups on Admission Preoperative Anxiety Level

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>9.24</td>
<td>2.80</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>17</td>
<td>8.37</td>
<td>3.39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>6.58</td>
<td>0.69</td>
<td>0.41</td>
</tr>
<tr>
<td>Within Groups</td>
<td>33</td>
<td>9.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 16

Summary of One Factor Analysis of Variance for Differences Between Experimental and Control Groups on Immediate Preoperative Anxiety Level

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>15</td>
<td>7.49</td>
<td>2.42</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>13</td>
<td>7.36</td>
<td>3.33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>0.12</td>
<td>0.01</td>
<td>0.90</td>
</tr>
<tr>
<td>Within Groups</td>
<td>26</td>
<td>8.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The possibility existed that the type of surgery anticipated might have an effect on the admission preoperative anxiety level of subjects. Specifically, because patients undergoing an abdominal hysterectomy were included in the sample, it was deemed necessary to investigate whether the loss of an organ, presumably highly related to body image, was more anxiety producing than the loss of other organs, such as a gall bladder. A summary of the fixed effects, one factor analysis of variance model used to test these variables is included in Table 17. No significant difference was found, at the .05
level, between types of surgery to be performed and subjects' preoperative anxiety level. In this study, the type of anticipated surgery did not significantly influence the level of preoperative anxiety which subjects experienced.

Table 17

Summary of One Factor Analysis of Variance for Different Surgical Procedures Anticipated and Preoperative Anxiety Level

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholecystectomy</td>
<td>18</td>
<td>8.37</td>
<td>3.13</td>
</tr>
<tr>
<td>Abdominal Hysterectomy</td>
<td>12</td>
<td>9.72</td>
<td>3.33</td>
</tr>
<tr>
<td>Exploratory Laparotomy</td>
<td>4</td>
<td>8.17</td>
<td>2.50</td>
</tr>
<tr>
<td>Marshall-Marchette Procedure</td>
<td>1</td>
<td>8.66</td>
<td>0.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3</td>
<td>5.03</td>
<td>0.51</td>
<td>0.68</td>
</tr>
<tr>
<td>Within Groups</td>
<td>31</td>
<td>9.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Whether the patient had previously experienced any major surgical procedures was a possible variable that might influence
preoperative anxiety level. Therefore a fixed effects, one factor analysis of variance model was used to test for the significance of experience with previous surgery on preoperative anxiety level. The results were not significant at the .05 level and are summarized in Table 18.

**Table 18**

Summary of One Factor Analysis of Variance for Experience with Previous Surgery and Preoperative Anxiety

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>18</td>
<td>9.69</td>
<td>2.91</td>
</tr>
<tr>
<td>Comparison Group</td>
<td>17</td>
<td>7.90</td>
<td>3.07</td>
</tr>
<tr>
<td><strong>Source of Variance</strong></td>
<td>df</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>27.84</td>
<td>3.12</td>
</tr>
<tr>
<td>Within Groups</td>
<td>33</td>
<td>8.94</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Therefore, in this study, whether the patient had any previous experience with surgery did not significantly influence the level of preoperative anxiety he experienced. The group of subjects having previous experiences with surgery were not significantly less...
anxious preoperatively than the group having no previous experience with surgery.

To determine the interactive effect of subjects' age (age was divided at 50 years into Young or Older subjects) and the experimental treatment with mean total postoperative anxiety, a two factor analysis of variance model was used and is summarized in Table 19. No significance was found at the .05 level.

Analysis of Digital Sweat Measure Over Three and Five Time Conditions

The Digital Sweat measure is reported to be a valid indicator of subject emotionality as discussed in Chapter II. In order to test whether it is a reliable and valid indicator of changes in subject emotionality in the clinical setting with subjects during the preoperative and postoperative surgical experience, certain analyses are important. If the level of anxiety preoperatively, when anticipation of threat is presumably great, is significantly greater than the mean level of anxiety on the third postoperative day (hours 48 - 72), when the major threat is past, support is derived for the use of digital sweat levels as valid and reliable physiological criterion or outcome measures of emotionality.

A one factor repeated measure of analysis of variance model was used to test the difference in amount of digital sweat over the
<table>
<thead>
<tr>
<th>Age</th>
<th>Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experimental Group</td>
<td>Comparison Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above 50 Years of Age:</td>
<td>N</td>
<td>13</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>9.39</td>
<td>10.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>5.55</td>
<td>7.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 50 Years of Age:</td>
<td>N</td>
<td>11</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>9.83</td>
<td>8.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.30</td>
<td>5.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Between Groups (Experimental and Comparison Groups)</td>
<td>1</td>
<td>0.38</td>
<td>0.01</td>
<td>0.91</td>
</tr>
<tr>
<td>(B) Between Older and Younger Age</td>
<td>1</td>
<td>1.40</td>
<td>0.25</td>
<td>0.82</td>
</tr>
<tr>
<td>A x B Interaction</td>
<td>1</td>
<td>7.56</td>
<td>0.28</td>
<td>0.60</td>
</tr>
<tr>
<td>Within</td>
<td>32</td>
<td>27.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
conditions of admission stress (night before surgery), immediate preoperative stress (one-half hour before surgery), and postoperative stress (mean level of digital sweat on the third postoperative day, hours 48 - 72). This analysis was performed on the total subject population for whom a reading existed on each of the three variables being analyzed ($N = 23$). Table 20 summarizes the results of this analysis.

These results reveal that there is a significant difference, beyond the .0001 level, of digital sweat as measured over the three treatment conditions of admission period (night before surgery), immediate preoperative period (one-half hour before surgery), and third day postoperative period (48 - 72 hours). Therefore support is generated for Minckley's (1974) finding that:

The palmar sweat values obtained in the postoperative period indicated that this variable fluctuated as much as pulse and blood pressure in the days following surgery, and did not remain at zero as Harrison et al. (1962) suggest. (p. 398)

Additionally, a one factor repeated measure analysis of variance was used to test for differences over five time conditions of the digital sweat level: (1) admission period, (2) immediate preoperative period, (3) first day postoperatively (1 - 24 hours), (4) second day postoperatively (24 - 48 hours), and (5) third day postoperatively (48 - 72 hours). These results were also significant with an $F$ value of 34.60 beyond the .0001 level.
Table 20

Summary of One Factor Repeated Measure Analysis of Variance for Conditions of Admission Anxiety, Immediate Preoperative Anxiety, and Mean Anxiety on the Third Postoperative Day

<table>
<thead>
<tr>
<th>Conditions of Time</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Anxiety Level</td>
<td>23</td>
<td>8.55</td>
<td>2.73</td>
</tr>
<tr>
<td>Immediate Preoperative Anxiety Level</td>
<td>23</td>
<td>7.55</td>
<td>2.94</td>
</tr>
<tr>
<td>Mean Anxiety Level, Hours 48 - 72 Postoperatively</td>
<td>23</td>
<td>3.43</td>
<td>2.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>231.24</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>561.41</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>339.05</td>
<td>2</td>
<td>169.50</td>
<td>33.54</td>
<td>0.00</td>
</tr>
<tr>
<td>Residual</td>
<td>222.36</td>
<td>44</td>
<td>5.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>792.66</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The means of the digital sweat levels are illustrated in Figure 1. These means show considerable variability over the five treatment periods and lend further support for Minckley's (1974) finding, e.g., that digital sweat levels do vary during the preoperative and postoperative surgical stress period. There is considerable
Figure 1

Mean Digital Sweat Levels (DSL) Over Five Time Conditions

variance in the means of these digital sweat print results for the two preoperative periods as compared to the three postoperative time periods as Figure 1 shows.

Results of Structured Interview Questionnaire

The Structured Interview Questionnaire (Appendix D) consisted of a series of five open ended questions designed to assess the subject's perception of his level of emotionality, and factors contributing to his present state on the day preceding surgery. Additionally,
15 open ended questions and one forced choice question (with 10 subsections), designed to assess subjects' perception of their emotionality and pain experience during the postoperative period, were administered on the fourth day after surgery.

Question 1 asked if subjects were tense or nervous before their surgery. Fifteen subjects indicated that they were very tense, thirteen subjects that they were moderately tense, and eight subjects denied that they were tense or nervous on the day preceding surgery. From this response it appears that the subjects were able to discriminate on their level of emotionality and were willing to verbalize their perceptions.

An analysis was done of the responses of subjects who evidenced high admission anxiety levels (above the median of 8.33 on the Digital Sweat measure) to question 1 which was stated, "Are you tense or nervous before your surgery?" The results of this analysis were that eight subjects indicated preoperatively that they were "highly nervous," seven subjects that they were "moderately nervous," and three subjects denied being nervous or tense. Therefore, of the 18 subjects who evidenced high levels of preoperative anxiety (above median of 8.33) on the Digital Sweat measure, 15 gave self-reports of moderate to high levels of tension and three subjects in this category denied being tense. Some support is generated by this study for the accuracy of self-report in assessing...
anxiety level of subjects preoperatively. Also support is evidenced for the research of Graham and Conley (1971) who found that subjects' self-reports of preoperative anxiety are "the most useful and frequently occurring indicators of preoperative anxiety" (p. 121).

When asked to describe the source of their preoperative anxiety in question 2, subjects gave a variety of responses. The responses were grouped into general categories and are detailed in Table 21.

Table 21

Subjects' Perception of Sources of Preoperative Anxiety

<table>
<thead>
<tr>
<th>Source of Anxiety</th>
<th>Number of Subjects Identifying</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
</tr>
<tr>
<td>Concerns about family functioning at home</td>
<td>9</td>
</tr>
<tr>
<td>Unclear expectation of self and results of surgery</td>
<td>4</td>
</tr>
<tr>
<td>Cutting and pain</td>
<td>4</td>
</tr>
<tr>
<td>Possibility of surgical complications</td>
<td>1</td>
</tr>
<tr>
<td>Concerns about anaesthesia (not being asleep, not waking up, loss of control)</td>
<td>1</td>
</tr>
<tr>
<td>Previous &quot;bad&quot; experience of self or others with surgery</td>
<td>1</td>
</tr>
<tr>
<td>Fear of vomiting</td>
<td>2</td>
</tr>
</tbody>
</table>

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These responses indicate that the greatest source of preoperative anxiety perceived by subjects are those relative to: (1) family, (2) unclear expectations for behavior or results of surgery, and (3) the thought of cutting and attendant pain.

When subjects were asked how they were attempting to cope with their own anxiety, the primary coping skill mentioned was physical activity. There were 14 responses to the effect that some type of physical activity had been used to try to cope with the anxiety being experienced. Seven subjects also mentioned deliberately trying to "keep their mind off the coming surgery" and five said they were "telling myself to relax and everything will be fine." Reading, smoking, seeking information, and faith were mentioned by one or two subjects. Physical activity and distraction appear to be the most usual ways in which subjects attempted to cope with their acknowledged anxiety.

Question 4 asked what other people were doing that helped to reduce subjects' tension preoperatively. The two responses given most often were: (1) the explanation of what to expect and the answering of questions by the physician were mentioned by 10 subjects, and (2) the support of family and friends was mentioned by 18 subjects. Family/friend support is seen as the most helpful in reducing subjects' anxiety before surgery.

There was a paucity of responses to question 5 which asked
subjects to identify behavior on the part of others which increased their tension preoperatively. Only eight subjects were able or willing to respond to this question. Five subjects indicated that the sharing by others of their own surgical experiences increased the subjects' anxiety. Three subjects generally identified family problems as contributing to their present preoperative anxiety.

Postoperatively, on the fourth day, subjects were asked if they had felt tense or nervous after surgery. The responses were approximately equally distributed: 16 persons said they were tense after surgery and 18 persons said they were not tense after surgery. In the experimental and control groups, equal numbers of subjects denied being tense postoperatively. Two more subjects in the experimental group, than in the control group, stated that they were tense after surgery. When asked to identify the source of their postoperative anxiety, if any, the responses were varied and idiosyncratic. The responses were categorized and are detailed in Table 22.

In response to question 8, subjects were able to identify some of their own coping skills for reducing their anxiety postoperatively. Talking to one's self and saying in essence, "you'll make it, so be calm and relax" was identified by 12 subjects as a coping skill. Four subjects identified prayer and faith, and two subjects said that crying helped them to cope with their postoperative anxiety.
### Table 22

**Subjects' Perception of Sources of Postoperative Anxiety**

<table>
<thead>
<tr>
<th>Source of Anxiety</th>
<th>Number of Subjects Identifying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate effect of surgery on health</td>
<td>9</td>
</tr>
<tr>
<td>Pain and discomfort</td>
<td>6</td>
</tr>
<tr>
<td>Breaking or disturbing sutures</td>
<td>5</td>
</tr>
<tr>
<td>Homesickness</td>
<td>4</td>
</tr>
<tr>
<td>Behavior and number of visitors</td>
<td>3</td>
</tr>
<tr>
<td>Cessation of smoking behavior</td>
<td>2</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
<td>1</td>
</tr>
<tr>
<td>Being unable to eat</td>
<td>1</td>
</tr>
</tbody>
</table>

Questions 9 and 10 asked what other persons did to reduce the subjects' tension and conversely what others did that raised the subjects' tension. The primary category of helpful activity, by others, was identified by subjects as some aspect of nursing care: Nurses talking to me (nine responses), backrubs (three responses), and nurses coming promptly in response to a subject's request (seven responses). Table 23 details the activity on the part of care givers which subjects in each group perceived as tension reducing during the postoperative period.
Table 23

Activity of Care Givers Perceived as Tension Reducing

<table>
<thead>
<tr>
<th>Activity</th>
<th>Control</th>
<th>Experimental</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses talking to me</td>
<td>2</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Backrubs</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Nurses coming promptly in response to subject’s request</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

In the experimental group, where sitting down and talking to patients and giving backrubs were part of the experimental treatment, 10 subjects identified these care giver behaviors as tension reducing; in the control group, these behaviors were mentioned by two subjects. Other persons identified as being helpful were the physician's explanations (two responses) and having spouse present (two responses). The behaviors of other persons viewed by subjects as not helpful were singular and varied, and the total number of responses appeared to reflect either an inability or unwillingness to identify such behaviors. The following behaviors were identified only one time: A roommate who cried, having to turn and cough, removal of surgical tape, difficulty starting intravenous infusion, and behavior of family, as increasing postoperative tension.

When asked if visitors increased or decreased postoperative
tension (question 11), 21 subjects responded that visitors were helpful. Nine subjects found visitors minimally helpful or actually unhelpful, depending on the manner of the visitor's behavior.

When subjects were asked if they had pain after their surgery, 31 responded yes, and two responded no. The description of their pain by subjects resulted in 22 responses that their pain was "a soreness, tenderness, and/or stinging sensation around the area of the incision." Eight subjects indicated that "sharp, severe gas pains" were the source of their postoperative pain. Additionally, one or two subjects offered the following descriptions of their pain: Very tense and restless, general body soreness, terrible incisional pain, sharp abdominal pain with coughing, nausea, and a deep, pulling sensation in the abdomen.

Subjects appeared to have difficulty identifying or verbalizing worries or concerns that the pain experience raised in their minds. Only 10 responses were elicited and each response by only one or two subjects. Concerns voiced were that: "The incision would break open," "I'll never be comfortable again," that the "pain means that something else is wrong," "what will the future be," e.g., has the surgery really corrected my health problem, and concerns and general anxiety about young children for whom the subject had primary responsibility.

Seventeen subjects described their pain as being greater than
they expected; thirteen as being about what they expected; and
seven as being less than they had expected. The level of pain
expectation was approximately equal in the experimental and con-
trol groups in each of these three categories.

Questions 16 and 17 were designed to elicit subjects' percep-
tions about what experiences raised and lowered their tension after
surgery. Again, it appeared that the subjects had some difficulty
identifying or verbalizing these causative factors.

Factors which subjects identified as raising their tension were
primarily concerned with the equipment and physical treatments
necessitated by the surgery. Intravenous infusions were named as
tension producing by five subjects; indwelling urinary catheter by
three subjects; nasogastric tube by one subject; and removal of
surgical adhesive tape by one subject. Additional causes were those
related to physical activity such as turning, coughing, deep breath-
ing, and ambulating. Two subjects experienced urinary tract
infections and this was a cause of concern to them.

Question 17 asked for experiences that decreased subject
tension postoperatively. These responses can be grouped into care
giver responses which subjects perceived as tension reducing and
responses of family and friends which helped to minimize tension.
Specifically, encouragement by nurses was named by six subjects;
the manner in which care givers helped me ambulate by five
subjects; and talking to care givers by four subjects. Explanation
by physician, back rubs, bathing and clean bed, and promptness of
care givers were each identified once as a source of postoperative
tension reduction. Additional sources of tension reduction provided
by family and friends were mentioned by five subjects.

The responses to question 18 are detailed in Table 24. This
question asked subjects to identify the one action of others which
subjects perceived to help their pain the most.

Table 24

<table>
<thead>
<tr>
<th>Action</th>
<th>Number of Subjects Identifying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promptness of administration of analgesic medication</td>
<td>23</td>
</tr>
<tr>
<td>Attention paid to description of pain</td>
<td>5</td>
</tr>
<tr>
<td>Backrubs</td>
<td>4</td>
</tr>
<tr>
<td>Care givers taking time to talk to me</td>
<td>4</td>
</tr>
<tr>
<td>Care givers believing me when I said I had pain</td>
<td>1</td>
</tr>
</tbody>
</table>

Subjects had difficulty identifying or verbalizing what actions
were not done, but which they would have found helpful, in reducing
their pain experience, as asked by question 19. There were only
five responses to this question: "Change position more often," "don't make patients wait for pain shot," "believe patient when he
says he has pain," "answer patients' questions," and "give the
analgesic medication about one-half hour before ambulation is
attempted."

Question 20 asked subjects to describe their mood today
(fourth postoperative day). The responses were categorized into
adjectives indicating: (1) positive moods, (2) negative moods, and
(3) variable moods. Twenty-one subjects described positive moods
such as very good, happy, and relaxed. Five subjects described
variable moods such as all right; tired, but good; and "up and
down." Eight subjects described a negative mood such as irritable,
mean, and depressed. Approximately an equal number of subjects
in the control and experimental groups described their mood as
being positive, negative, and variable.

In order to assess subjects' perceptions and awareness of
other physiological variables that are generally thought to be asso-
ciated with anxiety, the final question (question 20) attempted to
ascertain whether such physiological indicators were experienced by
the subjects postoperatively. The results of this question are
detailed in Table 25.

These results indicate that physiological variables presumed
to be concomitant to anxiety are experienced and can be identified by subjects postoperatively. The response of 23 subjects that they "attempted to be brave and control themselves" appears to indicate that subjects attempt to conceal the level of tension or emotionality that they experience postoperatively.

Table 25

Presence of Physiological Variables Associated With Anxiety During the Postoperative Period

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not Present</th>
<th>Present Sometimes</th>
<th>Present Most of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of heart pounding</td>
<td>25</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Rapid, difficult breathing</td>
<td>23</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Increased sweating</td>
<td>11</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Increased need to urinate*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time going by slowly</td>
<td>13</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Increased irritability</td>
<td>20</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Attempting to be brave and control self</td>
<td>7</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Wanting not to be alone</td>
<td>16</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Decreased desire to talk to others</td>
<td>17</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Increased desire to talk to others</td>
<td>9</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

*The presence of an indwelling urinary catheter in approximately 50 percent of the subjects precluded subjects' ability to respond to this variable and therefore it was omitted from analysis.
The results of the analysis of the Structured Interview Questionnaire indicate that the subjects responses to the questions do not discriminate between the experimental and control groups on any of the dimensions addressed. This analysis does, however, indicate some trends and areas for further research investigation which will be discussed in Chapter V.

Summary of Results

The results of the data analysis may be summarized as follows:

1. None of the five major hypotheses were supported by the data.

2. The inter-rater reliability correlations on the Digital Sweat measure were significant at the .05 level. This significant correlation, in spite of a time lapse of 2 to 4 weeks in the rating by the third rater, suggests that digital sweat prints do not darken significantly over time so as to be unreliable measures of emotionality.

3. Results of the post hoc analyses were:

   3.1 There was no significant initial difference between the experimental and control groups (before experimental treatment) on the level of admission anxiety and of immediate preoperative anxiety.

   3.2 The type of anticipated surgery did not significantly affect the level of preoperative anxiety which subjects experienced.

   3.3 Whether the subject had any previous experience with surgery did not significantly influence the level of preoperative anxiety he experienced.
3.4 No significant interactive effect of subjects' age and the experimental treatment with mean total postoperative anxiety was found.

3.5 A significant difference was found between preoperative digital sweat levels and mean third day postoperative digital sweat levels.

4. The results of the Structured Interview Questionnaire are detailed on pages 79 - 91.
CHAPTER V

DISCUSSION AND SUMMARY

The present study sought to measure the effect of specific nursing interventions (Nursing Intervention Treatment) on anxiety levels associated with the pain experience of postoperative patients. The results reported do not offer support for the five major hypotheses which state the expected effects of the independent variable (Nursing Intervention Treatment) on the dependent variables of postoperative anxiety levels, body temperature, and number of analgesic medications administered postoperatively. Additionally, no support was obtained for the interactive effect of preoperative anxiety levels and subjects' previous life stress with the independent treatment variable on the dependent variables.

Discussion in this chapter will address the design limitations of this study, the theoretical interpretations of the results of the analysis of the data, and conclusions and nursing implications of the study. Finally suggestions for further research, offered by the findings of this study, will be proposed and a concluding summary to the report offered.
Limitations of the Study

The study was limited in several significant ways. First, the independent treatment, Nursing Intervention Treatment, was designed for this study and was based on the efficacy for such measures offered by nursing theoreticians and patient testimony. The behaviors of the Nursing Intervention Treatment were also designed to ameliorate several theoretically proposed dimensions of the postoperative pain experience which are purported to increase patients' anxiety levels. Specifically these behaviors consisted of: (1) recognition of personhood by care givers, (2) rapidity of response by care givers to needs expressed by patients, (3) removal or minimization of noxious environmental stimuli, (4) provision of information to facilitate patient opportunities to develop realistic expectations of their present situation, (5) touch to facilitate the presence of another person and the nonverbal development of the nurse-patient relationship, and (6) development of the nurse-patient relationship through listening and verbal support of patients' pain coping skills to minimize the patient experience of helplessness.

The results of this study indicate that these proposed behaviors do not significantly affect postoperative anxiety levels as measured by a physiological indicator of emotionality, namely,
palmar or digital perspiration. There may be a critical dimension of anxiety reduction that is not addressed by the behaviors incorporated in the Nursing Intervention Treatment; or these behaviors may effectively reduce anxiety for some subjects, and not for others, based on personological variables that were not measured or assessed in this study. For example, coping styles may be an important personal variable that influences which nursing behaviors are effective in anxiety reduction. Additionally, the place of the individual in the life cycle, as evidenced by number and ages of persons whom they perceive as dependent on them, may be a significant variable influencing preoperative anxiety levels. It is to be noted as shown in Table 21 that 12 subjects, or one-third of the total sample, perceived "family concerns" as the primary source of the subjects' preoperative anxiety.

A second major limitation of this study is related to the design which used one hospital as an experimental site and one hospital as a control site. This meant that the experimental treatment was assigned by hospital and not randomly by individual subject. This design has several inherent limitations attendant to it. First, it is possible that the two small hospitals and their medical staff serve and therefore admit patient populations which are significantly different on some unknown variable or variables. Thus the control and experimental groups may have differed in
unknown ways from the outset of the study, ways which might have contributed in unknown magnitude to the lack of significant results related to the major hypotheses of the study. Additionally, assignment of experimental treatment by hospital, and not by individual subject, combined with the relatively small sample size (N = 36), may not have afforded significant control over the large number of intervening variables which were impossible to control in the clinical experimental situation of the study. Thirdly, because two small hospitals were used in this study, it required a time period of approximately 4 months to obtain the required sample size of 36 subjects. The longevity of the study may have influenced the nursing staff's interest, enthusiasm, and level of consistency in maintaining the desired treatment level and/or obtaining a Digital Sweat measure each time the patient complained of pain, as the study required.

The investigator observed that the number of nursing staff complaints, which may be viewed as resistance to the study, increased in late February and March. This period coincided with extremely poor weather conditions for driving, a blizzard which necessitated the staff working 12 hour shifts or double shifts with minimal numbers of care givers on duty. Each of these factors may have significantly influenced the level of incentive, consistency, and manner in which the experimental Nursing Intervention
Treatment was carried out.

A third major limitation of the study is related to the pattern of staff assignment which existed in both the experimental and control hospitals. Both surgical units used essentially the functional method of assignment. This assignment pattern meant that prepared, but nonprofessional, care givers (nursing aides and assistants) were administering significant amounts of care to the subjects. Nursing personnel (practical and registered nurses) primarily administered the required analgesic medications and carried out the treatments ordered by the physician. For this reason, all direct care givers were trained in the steps of the experimental Nursing Intervention Treatment. This meant that at times two different persons were simultaneously administering various steps of the Nursing Intervention Treatment procedure. This fractionalization of care for the experimental treatment may have significantly reduced its effectiveness. Specifically, one important dimension of the experimental treatment may have been diluted by this functional staffing pattern; namely, the dimensions of the Nursing Intervention Treatment which were designed to potentiate the development of the nurse-patient relationship. It may be, and likely is, that with more than one primary care giver, the support which a working helper-helpee relationship affords is markedly reduced.
Lastly, the Structured Interview Questionnaire is a limitation of the study. This interview questionnaire was carried out by the investigator. While this fact may have added reliability in eliciting and recording subject responses, it also may have contributed a degree of interviewer bias in that the interviewer of necessity knew to which group the subject was assigned. Additionally, the questions of the Structured Interview Questionnaire, while yielding descriptive data, do not appear to be worded or designed properly to elicit differential responses from the groups, should such responses have been actually, potentially present. Also, the first five questions of the questionnaire were asked during the preoperative period, because of concern that subjects would not remember their preoperative concerns during the postoperative period. It is conceivable that subjects actually would feel more free postoperatively to reveal their preoperative anxieties because they have successfully been through surgery. Also the postoperative period would afford the subject more familiarity with the interviewer inasmuch as this would be the second contact between the two persons. Graham and Conley (1971) found that subjects postoperatively did remember their preoperative concerns and anxieties and were in some instances more willing to verbalize these preoperative concerns during the postoperative period.
Theoretical Interpretations of Results

Theoretical interpretations will be made of the results of:
(1) the five major hypotheses and (2) additional post hoc analyses of
selected data generated by the results of the analysis of the five
major hypotheses.

The first three major hypotheses were those which proposed
a significant effect of the experimental Nursing Intervention Treat-
ment on the subjects' first 72 hour postoperative anxiety levels and
recovery indices of mean body temperature and number of analgesic
medications received. No significant findings were found for these
major hypotheses. The study failed to support a significant effect
of the experimental Nursing Intervention Treatment on first 72
hour postoperative anxiety levels, mean body temperature, and
number of analgesic medications administered. These nonsignifi-
cant results may indicate that the behaviors of the experimental
Nursing Intervention Treatment are, in and of themselves, ineffect-
tual in reducing anxiety attendant to pain during the postoperative
period. It may be that the development of a positive nurse-patient
relationship is the crucial dimension without which any additive
behaviors or nursing interventions are ineffective in reducing anxi-
ety. In other words, it may be that "how" and in "what context"
behaviors are performed to reduce anxiety are more crucial than
"what" is done.

Further support for this possible interpretation of the results is gained from the degree of discomfort expressed by nursing staff, in the initial training sessions of the experimental Nursing Intervention Treatment, prior to implementation of the study. Several staff members evidenced and voiced considerable concern about sitting and communicating with the patient about his feelings during the pain experience and his habitual ways of coping with pain. It is conceivable that in actual implementation of this aspect of the Nursing Intervention Treatment, the degree of discomfort felt by the staff was great enough to unconsciously or consciously impede the major intent of these behaviors, i.e., that of relationship formation through communication and reduction of patients' helplessness through focusing the patient on successful past coping behaviors.

Additionally, personality variables, not controlled in this study, may have been significant in affecting the subjects' response to the experimental Nursing Intervention Treatment. For example, it may be that the treatment had an aversive effect on subjects whose habitual response to anxiety is to withdraw from interpersonal contact. Such subject coping skills might cause a negative response to attempts on the part of others for relationship formation and active interaction. If this were true, the Nursing
Intervention Treatment might have had a negative effect on the postoperative anxiety level for such persons. This phenomenon could obscure any positive effect of the Nursing Intervention Treatment on those persons who cope with anxiety by seeking human contact and relationship to reduce the intensity of their anxiety.

The recovery rate indices or criterion measures of mean body temperature and number of analgesic medications may have been subject to other intervening variables. Intervening variables related to the general postoperative course, such as level of hydration and amount of surgical manipulation may have affected body temperature. Such variables may obscure significant results using mean body temperature as a criterion measure to assess resultant effects of specific nursing interventions. Indices such as body temperature and number of analgesics administered have been used in many studies as indicators of recovery rate. However, Wolfer (1973) points out that in clinical nursing research there is a considerable number of uncontrollable and nonrandomized intervening variables with a small sample which may exert an effect on recovery rate. The effect exerted may be of such a magnitude to obscure any significant effect of the experimental independent treatment variable being studied.

The fourth hypothesis proposed an interactive effect of high levels of preoperative anxiety with the experimental treatment,
such that those subjects with high levels of preoperative anxiety would exhibit a greater positive response to the experimental Nursing Intervention Treatment than would subjects with low preoperative anxiety levels. The results were nonsignificant for this proposed interactive effect. Janis's (1958) research indicates that a moderate level of preoperative anxiety is more facilitative of a positive postoperative recovery than are either of the high or low extremes of preoperative anxiety. Moderate levels of preoperative anxiety appear to facilitate active subject preparation and coping processes; whereas, high levels of preoperative anxiety lead to random ineffectual attempts to cope, in a preparatory way, with the anticipated stress of surgery. Low levels of preoperative anxiety appear to indicate a denial of the approaching stress and hence no active preparatory coping. This denial phenomenon leads to reduced ability to cope with postoperative stresses of the surgical experience. In light of Janis's (1958) findings, it is difficult to explain the failure of the results of this study to show a significant effect on subjects who experienced high preoperative anxiety. These subjects would, following Janis's findings, benefit from the structured experimental Nursing Intervention Treatment. This experimental treatment should facilitate the coping skills postoperatively of subjects whose preoperative coping skills were ineffectual because of high levels of anxiety. Therefore the results again
indicate that the experimental Nursing Intervention Treatment
behaviors did not significantly alter the postoperative anxiety asso-
ciated with the pain experience.

Of interest, however, is Janis's (1958) statement that:

Persons who react with a moderate level of anticipatory fear are less likely to have a history of psycho-
neurotic disorder than those who react with low or high
anticipatory fear. (p. 404)

If this is true, high anxiety subjects preoperatively may be exhibiting evidences of trait anxiety which the experimental treatment of
this study did not propose to measure or affect. This introduction
by Janis (1958) of trait anxiety lends insight into the nonsignificant
results related to Hypothesis 4. High levels of preoperative anxi-
ety may be primarily the result of trait and not state anxiety.

Therefore, one would not expect the experimental treatment of the
present study to exert a significant postoperative effect on anxiety
levels.

Hypothesis 5 sought to establish an interactive effect of high
levels of life stress in the year preceding surgery with the experi-
mental treatment, Nursing Intervention Treatment. It was proposed
that high levels of stress in the year preceding surgery would render
the subjects more vulnerable to the additional stress of surgery,
and hence the experimental Nursing Intervention Treatment would
provide differentially greater support to such persons. This
support would then enable more highly situationally and life
stressed subjects to cope with less anxiety to the postoperative
pain experience. However, no such interactive effect was supported
by this study. Two possible reasons for the nonsignificant results
generated for this hypothesis are proposed.

First, the Schedule of Recent Experience questionnaire used
in this study to assess previous life stress was one developed by
Rahe (1972). This questionnaire was designed to report life
changes of many varieties which Rahe's research indicates are
associated closely with mental stress and future physical illness.
The normative studies of this instrument indicate that middle class
persons of widely divergent "cultures show extremely close agree-
ment in the weightings of the various life change events" (p. 253).
However, norming data of this instrument indicates that:

The major factor in determining how people
scale the life events is their socio-economic back-
ground. The Mexican-Americans, for example,
rated death of family members, jail term, being
fired from work - all life change events with high
LCU values for Seattlites - as not much higher in
LCU magnitude than financial changes, making
expensive purchases, and a residential move - life
change events with low LCU values for Seattlites.
(Rahe, 1972, p. 255)

Therefore, possibly the Schedule of Recent Experiences question-
naire used in the present study, as a measure of previous life
stress in the year preceding surgery, may not have accurately
identified subjects who experienced various levels of life stress because the socio-economic variable was not considered.

More recent revisions of the Schedule of Recent Experiences questionnaire (renamed the Recent Life Changes Questionnaire) include an additional 13 life change questions as well as an opportunity for subjects to self-evaluate and scale the life changes they have experienced by estimating the impact which they believe such events to have had on them. The scoring of this revised measure enables one to "obtain a subjective stress estimate" (Rahe, 1975, p. 136). Perhaps the revised measure with its scoring possibilities would provide a better measure of actual stress level felt by the subject because of recent life experiences.

Post hoc analysis of the data attempted to support the pretreatment equality of the experimental and control groups on crucial variables. Namely, the experimental and control groups were compared for pretreatment equality on the variables of:
(1) level of admission anxiety and (2) level of immediate preoperative anxiety. No significant difference was found between the experimental and control groups on these two variables. Therefore a significant pretreatment difference on these variables cannot be held accountable for the resultant insignificance found on the post-treatment results between the two groups.

The significant finding that type of surgery (abdominal
hysterectomy and cholecystectomy) anticipated did not have a significant effect on the level of preoperative anxiety is interesting. Previously it has been theorized that anticipatory anxiety attendant to an abdominal hysterectomy is greater than anticipatory anxiety attendant to other non sex related abdominal surgery. Such findings require further study, investigation, and attempts to substantiate.
The age of persons undergoing a hysterectomy (e.g., of child bearing or non child bearing years) may be the critical variable in level of anxiety preparatory to an abdominal hysterectomy. It may also be that a crucial variable is that there is a changing female view of the presence or absence of certain organs as indicators of femaleness and therefore of great ego syntonic value. If such is the case, removal of these organs may not generate the additional anticipatory anxiety that existed under past cultural belief systems.

Subjects' previous experience with major surgery was not found to significantly affect present preoperative anxiety levels. This finding indicates that one cannot predict from the subjects' previous familiarity with surgery his present emotionality in response to surgery. This finding supports the research of Graham and Conley (1971) who found that "previous hospitalization for major surgery cannot be said to be associated with either low or high levels of anxiety" (p. 120).

Additionally, as would be expected from the lack of
significance found overall for the effect of the experimental treatment, there was also no significant interaction of age with the experimental treatment.

Conclusions and Nursing Implications

Conclusions which can be drawn from the results of this study are detailed for the purpose of proposing possible nursing implications based on the results of this study.

1. The level of emotionality, as measured by the physiological indicator, Digital Sweat Index, is considerably greater during the 24 hour period preceding major elective abdominal surgery than during the 72 hour immediate postoperative period. Mean digital sweat values are also elevated above zero postoperatively although to a level considerably less than that level observed before surgery. This finding may lead to the use of a simple to obtain and nonintrusive physiologic measure of emotionality in clinical nursing practice. The availability of criterion outcome measures of emotionality that can serve as indicators of effectiveness of nursing interventions on anxiety levels of clients is important. Such measures serve as one means of evaluating a primary function of nursing, namely, affecting altered psychological states.

2. The results show that, using the Digital Sweat measure, high levels of emotionality do occur in the preoperative period which
may be a crucial time for nursing intervention to occur. Granted, preoperative teaching and preparatory information giving have been extensively studied and the value of such measures seems assured. Other preoperative nursing interventions need to be investigated. It may be that the heuristic value of the present study lies in addressing patient needs during the crucial 24 hour preoperative period for the dimensions of care which this study attempted to investigate during the immediate postoperative period. Further research needs to be done to determine if nursing care which addresses patient needs for: (1) recognition of personhood, (2) rapidity of response by care givers to patient expressed needs, and (3) touch, listening, and verbal support to facilitate the development of the nurse-patient relationship during the preoperative period will have an effect on patient's postoperative recovery.

3. The results of the Structured Interview Questionnaire are of importance in the responses offered to several questions. First, 28 subjects were able to identify and verbalize that they were anxious to a high or moderate degree preoperatively. This finding lends some support to the use of self-report questioning as a means of assessing the patient's level of emotionality.

4. The finding that "concerns about family functioning at home" was identified by 12 subjects as a source of their preoperative anxiety indicates that nursing interventions might be designed
to support patients and their families preparatory to hospital admission for surgery. For example, nurse-led group discussions between several patients and their families who are anticipating surgery might provide support and planning mechanisms to reduce the stressful impact which impending surgery and absence from family apparently generates.

5. The use of "physical activity" as a primary coping skill for preoperative anxiety was mentioned by 14 subjects. This may indicate that provision for the use of physical activity by patients during the preoperative period should be a nursing intervention measure.

6. That family and friend support is seen as significant by 18 subjects in reducing preoperative anxiety may validate and lend substantiation to several nursing interventions designed to potentiate family support. Interventions such as including family in preoperative teaching, allowing the family to remain near the patient by providing comfortable waiting rooms if they desire, even provision for seeing the patient briefly in the recovery room as soon as he is awake. These are only examples of the possible means that can be used to maximize the support which some patients see as a crucial means of relieving their anxiety.
Implications for Further Research

The results of the present study lead to recommendations for further research in the following areas.

1. The behaviors of the Nursing Intervention Treatment need to be subjected to study in other anxiety producing situations experienced by patients under the stress of illness or hospitalization. For example, these behaviors might be tested for their anxiety reducing effect on patients as they experience surgical procedures conducted under local or regional anaesthesia. Lesse (1970) has reported his investigations of anxiety levels attendant to the stress experienced by schizophrenic patients undergoing craniotomies under local anaesthesia. However, one might consider the more common stresses of general hospital patients experiencing major intrusive diagnostic procedures. Also, the effect of such measures in reducing the anxiety experienced by relatives of patients who have been admitted to a coronary care unit might be investigated. These types of studies would contribute to the need for process-outcome studies which Bloch (1975) speaks to as being greatly needed dimensions of nursing research. Bloch (1975) in discussing process-outcome research studies stated:

These latter types of studies would seem to be the most appropriate manner for testing nursing practice and for developing nursing knowledge and nursing practice theory. It should be considered a task for the
researcher (with extensive practitioner involvement, of course), rather than a goal for quality control programs. (p. 262)

2. This study limited the measurement of anxiety to the first 72 hours postoperatively. It is possible that the experimental Nursing Intervention Treatment would not effect immediate postoperative anxiety, but quality of life as evidence by subject responses to their surgical experiences some weeks postoperatively. The possible effect of this phenomenon on health care seeking behaviors of subjects in the future might be investigated.

3. Future clinical nursing research studies might focus on affecting recovery rate indices by exploring the effect of specific nursing care behaviors on patients experiencing different types of surgery. Additionally, subjects might be selected for treatment on predetermined personological variables thought to be contributory to treatment effect. For example, one such category may be subjects without major interpersonal family support. The results of this study indicate that 12 subjects felt such support to be a significant factor in their coping and level of anxiety during the surgical experience. When this dimension of family support is absent, can nursing behaviors be specified and investigated which would be effective in providing such support and anxiety reduction.
Summary

This investigation explored the effect of a nursing intervention treatment on: (1) the anxiety component of patients' postoperative pain experiences and (2) the recovery rate indices of postoperative body temperature, ambulatory efforts, and number of analgesic medications required. The study also sought to investigate whether there was a differential nursing intervention treatment effect for subjects who had experienced: (1) high and low levels of life stress in the year preceding surgery and (2) high and low levels of anxiety during the preoperative period. Evidence to support an effect related to use of the experimental Nursing Intervention Treatment was not found.

The sample consisted of 36 adult patients undergoing elective major abdominal surgery in two small hospitals in Southwestern Michigan. One hospital served as an experimental hospital in which nursing staff were trained in the procedural steps of the experimental Nursing Intervention Treatment (N = 18). The second hospital served as the control hospital in which the nursing staff carried out their usual nursing care in response to the subjects' postoperative pain experience (N = 18).

The level of anxiety was obtained preoperatively on admission, one-half hour before surgery, and postoperatively when the subject
complained of pain. The level of anxiety was obtained through the measurement of digital sweat in the manner developed by McNair, Droppleman, and Kussman (1967). The subjects' level of previous life stress was assessed through administration of the Subjects' Recent Experience Questionnaire developed by Rahe (1972).
Additionally, a descriptive Structured Interview Questionnaire, developed for this study, was administered to assess subject self-reports on various aspects of their emotional state during the preoperative and postoperative periods.

The findings did not support the five major hypotheses of an experimental treatment effect on postoperative anxiety levels associated with the pain experience, mean body temperature, or number of analgesic medications administered.

Post hoc analyses, generated by the results of analysis of the five major hypotheses, revealed findings relative to: (1) the Digital Sweat measure as a significant indicator of changing levels of emotionality during surgical patients' preoperative and postoperative course, (2) level of preoperative anxiety was not significantly different for type of surgery anticipated, abdominal hysterectomy and cholecystectomy, and (3) whether subjects had experience with prior surgery did not significantly effect their preoperative anxiety level in response to the present surgical experience.

Important findings of the Structured Interview Questionnaire
were that subjects: (1) appear able to identify and report their level of emotionality during the preoperative period, (2) manifest a primary preoperative anxiety related to "concerns about family functioning at home," and (3) use "physical activity" as an important coping skill in their attempts to ameliorate preoperative anxiety.

Possible explanations for the findings were discussed; implications for nursing practice proposed; and suggestions for further research developed.
REFERENCES


Bettelheim, B. To nurse and to nurture. *Nursing Forum*, Summer 1962, **1**(3), 60-76.


Johnson, J. E. The effects of preparatory information on the recovery of surgical patients. Sigma Theta Tau Monograph #2, 1976, 6-19.


APPENDICES
Code # ______________________

Name ______________________

Data Sheet

Hospital Admission Date ________________

Permission to participate ________________

Life Changes Questionnaire ________________

Initial finger print (day before surgery) ________________

Immediate preop fingerprint ________________

Surgery date and time ________________

4th postop day Questionnaire ________________

Age _______ Sex _______ Ht. _______ Wt. _______

Preop temp. ________________

Previous surgery(s) 1 ________________

2 ________________

3 ________________

Present surgery ________________

Preop medication ________________ (drug, dose, route)

Anaesthetic ________________

Postop medication prn pain ________________ (drug, dose, route)

Other postop medication orders

1 ________________ 3 ________________

2 ________________ 4 ________________
Temperature

1st 24 hrs postop
2nd 24 hrs postop
3rd 24 hrs postop

Ambulatory Activities

1st 24 hrs postop
2nd 24 hrs postop
3rd 24 hrs postop

PRN pain med given postop (drug, dose, route)

1st 24 hrs postop
2nd 24 hrs postop
3rd 24 hrs postop
Appendix B

Permission Slip
Permission Slip

The nature of this nursing study has been explained to me and I agree to participate in it by: (1) answering some questions about changes in my life over the past year and about my experiences after surgery, and (2) allowing a print of my finger to be taken at intervals after surgery.

I understand that my participation is voluntary and my identity will remain unknown by using a code number for purposes of this study.

Patient's Signature __________________________
Witness __________________________
Date __________________________

Thank you for your cooperation and participation in this study.
Appendix C

Nursing Intervention Procedure
Nursing Intervention Procedure

The treatment consists of the following sequential behaviors on the part of the nurse (for 1st 72 hrs. postop).

1. The patient is called by name and the nurse introduces herself to the patient upon his return to the unit from the recovery room. Recovery room nurse also does this.

2. The patient is told that he has a medication ordered for pain and the time schedule by which this medication may be administered.

3. When the patient expresses that he is in pain (or observed to be so) the following procedure is followed:

   3.1 The nurse encourages the patient to describe and locate the pain/discomfort.

   3.2 The ordered analgesic is given within five minutes. (If the time contingencies prohibit this, the nurse so informs the patient that the medication will be given at the first allowable time and proceeds with the remainder of the steps of the procedure.)

   3.3 The patient is given a 2-3 minute backrub and repositioned for comfort.

   3.4 Linens are checked for soiling, wetness, wrinkling, and changed or straightened.

   3.5 The opportunity to void is offered.

   3.6 The dressing is observed, changed or reinforced if necessary, and a verbal report on its condition is given to the patient.

   3.7 The intravenous infusion, naso-gastric suction, catheter, if present, are observed and a report is given to the patient.

   3.8 The nurse sits quietly with the patient, eliciting and responding to the patient's verbalizations. During
this time she asks the patient about his usual ways of dealing with pain, and reinforces and encourages his present use of those pain coping skills which are appropriate in this situation.
Appendix D

Structured Interview
Structured Interview

Before Surgery (admission day)

1. Are you "tense" or "nervous" before your surgery?
2. Please describe what you are tense or nervous about?
3. What are you doing to reduce your tenseness/nervousness?
4. What are others doing to reduce your tension (physician, family, staff)?
5. What are others doing that seems to increase your tension?

After Surgery (4th postoperative day)

6. Were you tense or nervous after your surgery?
7. Please describe what you were tense or nervous about?
8. What did you do to reduce your tension?
9. What did others do that reduced your tension? (cue preop teaching)
10. What did others do that increased your tension?
11. Did the visitors you had increase or decrease your tension?
12. Did you have pain after your surgery?
13. Please describe, in your own words, what you felt?
14. What were the thoughts or "worries" that went through your mind when you were in pain?
15. Was the pain that you had, more than, less than, or about what you expected?
16. After surgery, what one action or experience increased your tension most?

17. Decrease your tension most?

18. What action, on the part of others, helped you most during your pain?

19. What actions could others have taken which you think would have been of help to you during your pain?

20. Please describe your mood today.

21. To what extent were you aware of the following when you were in pain?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Seldom of time</th>
<th>Often of time</th>
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<td>Pounding of heart</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid or difficult breathing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased sweating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need to urinate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time going by slowly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in irritability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attempt to &quot;control&quot; yourself</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanting &quot;not to be alone&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease desire to talk to others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased desire to talk to others</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Appendix E

Record of Nursing Intervention Data
<table>
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<tr>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
</tr>
</thead>
</table>

Pt. called by name/ nurse self intro.

Pt. told re prn med. schedule

Pain described and noted

PRN pain med given

Fingerprint taken

2-3 min. backrub/ repositioned for comfort

Linens checked and changed or smoothed

Voiding offered
Drsg. observed, reinforced and report to pt.

Tubing checked, report to pt.

Nurse sits with pt., enc. verbalization supports appropriate coping mechanisms

Fingerprint 1/2 hr. post prn med.

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
<th>Date/Time</th>
</tr>
</thead>
</table>

Key: Done--note date, time, initials
Not done--note reason, and initial
Appendix F

Detailed Finger Sweat Print (FSP) Procedure for Experiment
Detailed Finger Sweat Print (FSP) Procedure
for Experiment

When to obtain finger print

1. Immediately before giving preop medication.

For 1st 72 hrs. postop:

2. Immediately after administering each prn pain medication.

3. One-half hour after each prn pain medication has been administered.

How to obtain finger print

1. Dip clean, cotton swab into the Ferric Chloride Solution.

2. Swab distal part of middle finger of Rt. Hand.

3. Allow to dry for 30 seconds.

4. Place paper strip in plastic splint (touch only corner of paper).

5. Place splint on distal middle finger (with splint covering first joint of finger) and attach with rubber band.

6. Leave splint in place for 1 minute. (Hold finger up to prevent pressing finger against a hard surface.)

7. Remove paper from splint (touching only corner) and place paper in separate glassine envelope.

8. Label envelope with

   8.1 Pt's code number

   8.2 Date

   8.3 Time taken/ your initials

   8.4 At prn med. or 1/2 hr. post prn med.
Appendix G

Detailed Finger Sweat Print (FSP) Procedure
DETAILED FINGER SWEAT PRINT (FSP) PROCEDURE

The purpose of this document is to detail in "cookbook" fashion the finger sweat print procedure (FSP), so that other investigators may use the technique with a minimum of trouble.

In general the procedure involves:

1. Preparing paper strips using Tannic Acid, Thymol, and distilled water.
2. Preparing a Ferric Chloride Solution using Ferric Chloride, Hydrochloric Acid, and Acetone.
3. Actually taking the prints.
4. Rating the prints.

Preparing Paper Strips

A. **Mixing the Tannic Acid Solution**

1. Put 1000 cc. of distilled water in a pyrex glass container.
2. To the distilled water add 50 grams of Tannic Acid and one gram of Thymol.
3. Stir mixture while heating it gently. Possibly a glass stirrer would be best.
4. When the ingredients are in solution, filter the solution using a glass funnel into the opaque container and put the lid on.
5. Under refrigeration the solution will "keep" for 6 months.

B. **The Paper Strips**

1. Sheets of Whatman Filter Paper, Grade #1 or #3 in 2, 3,
4 cm. or 1 in. widths can be used. Using paper of differing widths for different subjects seems to be an unnecessary complicating addition. In my experience 1 in. was sufficient for the widest finger encountered. (The same grade should be used throughout a single experiment.)

2. Length: The final length of the prints that will be used is roughly 1 1/2 to 2 inches; however, at this stage cut them just long enough to fit flat in the bottom of a "pyrex" dish. The purpose of this is to make them easier to handle at this stage while soaking them and to cut down on variability in soaking time.

Wear plastic gloves while cutting the paper strips to keep finger prints off the paper. Cut the paper with stainless steel scissors. Cut more strips than you will need, since some may be "spoiled."

3. Pour just enough of the Tannic Acid Solution into a "pyrex" dish so that one layer of the filter paper will be covered by the solution.

4. Wearing a plastic glove, lay several of the paper strips in the dish so that they do not overlap.

5. After three minutes of soaking, take the strips out of the solution (wear a plastic glove). Shake the excess Tannic Acid off the strips and lay them on a clean formica counter to dry. After about 5-10 minutes pick up the strips and move them to a dry spot on the counter. This removes the excess Tannic Acid and prevents the edges of the strips from turning dark.

6. The strips will dry in about an hour. Give them at least this much time. They tend to curl a little as they dry.

7. Using plastic gloves and the steel scissors, cut the strips into desired lengths. If there are black dots on the paper, cut around them. When dried the strips should have a very light, tannish color.

8. Do not reuse the Tannic Acid Solution, since there is the danger that iron may get into it as it is being used. There is enough solution for several batches. Additional Tannic...
Acid Solution can be made if necessary.

9. If black dots appear on the paper this indicates that the iron somehow was introduced into the procedure. If there are many of them, then a careful examination of the techniques used should be carried out to reveal the source. Paper free of black dots and of light, tannish color meets the criteria for appropriate use.

The Ferric Chloride Solution

C. Materials

1. Thirteen grams of Anhydrous Ferric Chloride (FeCl₃). We used: Ferric Chloride, Anhydrous, Reagent, Powder, Sublimed, FeCl₃.

2. Three drops of hydrochloric acid. Use full strength, since it is mixed with 400 cc. of Acetone, and there is no danger to Ss.

3. Get a one pint bottle of Acetone. We used: Acetone: Baker Analyzed Reagent. 400 cc. of Acetone will be used in the Ferric Chloride Solution. It might be best to get 2 bottles of Acetone to have an extra amount on hand.

4. An opaque glass container in which to store solution.

5. A glass medicine dropper.


7. Put 400 cc. of Acetone Reagent grade into a 1000 ML Graduate Cylinder.

8. Add 13 grams of FeCl₃ and three drops of undiluted HCL.

9. DO NOT HEAT THE MIXTURE; ACETONE IS HIGHLY FLAMMABLE.

10. Stir the solution. When the chemicals are in solution, filter them into the opaque container and put the container in a refrigerator.
Taking the Print

1. The finger used is a matter of personal choice. It should be held constant. Most work has been done with the index finger. A variety of ways of cleaning the finger have been tried, e.g., washing, alcohol, acetone. It might be worth mentioning that the S could simply wash his hands before the experiment. I collected some data which I felt did not justify publication because of the insignificance of the problem that indicated that washing the hands or cleaning them with acetone did not yield prints distinguishable from those from unwashed hands or those cleaned with acetone.

2. Dip clean, cotton swab into the Ferric Chloride Solution. Then swab the distal part of the finger, first one hand then the other. The Ferric Chloride Solution should dry in 30 seconds or less. It is useful to have some small (2 or 3 ounce) bottles to pour FeCl₃ into so each S can have his own fresh solution without wasting too much FeCl₃.

3. While the Ferric Chloride Solution is drying on the finger, place a strip of paper in the middle of a plastic splint. The width of the paper and splint should be appropriate for the size of the S's finger. A piece of adhesive tape should have been placed on the splint crosswise so that the side edge of the tape and one end edge of the plastic splint coincide. Prelabeling the print seems to facilitate operations for the experimenter.

4. When the Ferric Chloride Solution is dry (after 30 seconds) have the S place the distal part of his finger on the paper strip. Then, quickly wrap the adhesive tape around the finger to fold the splint and paper firmly against the finger. START TIMING. Tell the S to hold his finger up (to prevent his pressing the finger against a hard surface).

5. Use the print duration that best fits the design of your study with preference given to shorter time periods.

6. After the timed period quickly remove the tape, paper, and splint from the finger.
The Green Glop Problem

When FeCl₃ is transferred to the Tannic Acid treated filter paper in the presence of sweat (water), it leaves a green residue ("green glop") which will in time pick up moisture from the air and turn grayish black. The color is easily distinguishable from the ordinary print color with a little experience. The green glop problem usually only occurs toward the end of a series of repeated measurement, and can be greatly reduced by the following precautions: (1) coat the finger lightly; (2) protect the FeCl₃ solution, i.e., try to reduce evaporation of the acetone which acts solely as a drying agent by: (a) keeping a lid on the FeCl₃ except when dipping and (b) using a small amount of FeCl₃ at a time and changing the solution after X number of prints or X amounts of time.

Print Ratings

1. A photograph of "standard" prints may be used to rate the prints. It can be obtained from Dr. Douglas McNair, 700 Harrison Avenue, Boston, Massachusetts for $2.00. Make the check out to the Psychopharmacology Laboratory, Boston University Medical Center.

2. We use a photograph of a 15-point scale (interrater r = .94-.97). We use three raters who have varied from one study to another. Each rater seems to have his own mean level of rating, so that it is advisable to use the same three raters for all ratings in a study.

It seems advisable to have all the ratings done in the same
place to keep lighting conditions as standard as possible. Raters are easily trained. We feel that rating the darkest spot or the "blackness" of the darkest spot gives the most valid rating, so this is how we instruct new raters. The one exception to this is when there is only one dot that is very dark relative to a group of lighter dots. We do not feel that one dot provides sufficient evidence to make a valid rating, so that we rate the lighter dots.

We rate the prints at the end of each day's testing or at some constant post-measurement time since Paul's (1966) data suggest that the prints may darken over time. We simply use the sum of the three ratings in the analysis of the results, but the mean rating will provide the same results within rounding error.
Appendix H

Photograph of Digital Sweat Prints
Appendix I

Schedule of Recent Experiences
Questionnaire
Schedule of Recent Experiences Questionnaire

Circle those events which you have experienced in the past year.

LCU Values

Family:

- Death of spouse: 100
- Divorce: 73
- Marital separation: 65
- Death of close family member: 63
- Marriage: 50
- Marital reconciliation: 45
- Major change in health of family: 44
- Pregnancy: 40
- Addition of new family member: 39
- Major change in arguments with spouse: 35
- Son or daughter leaving home: 29
- In-law troubles: 29
- Spouse starting or ending work: 26
- Major change in family get-togethers: 15

Personal:

- Detention in jail: 63
- Major personal injury or illness: 53
- Sexual difficulties: 39
- Death of a close friend: 37
- Outstanding personal achievement: 28
- Start and end of formal schooling: 26
- Major change in living conditions: 25
- Major revision of personal habits: 24
- Changing to a new school: 20
- Change in residence: 20
- Major change in recreation: 19
- Major change in church activities: 19
- Major change in sleeping habits: 16
- Major change in eating habits: 15
- Vacation: 13
- Christmas: 12
- Minor violations of the law: 11
<table>
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<th>LCU Value</th>
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<tbody>
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<td>47</td>
</tr>
<tr>
<td>Retirement from work</td>
<td>45</td>
</tr>
<tr>
<td>Major business adjustment</td>
<td>39</td>
</tr>
<tr>
<td>Changing to different line of work</td>
<td>36</td>
</tr>
<tr>
<td>Major change in work responsibilities</td>
<td>29</td>
</tr>
<tr>
<td>Trouble with boss</td>
<td>23</td>
</tr>
<tr>
<td>Major change in working conditions</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>LCU Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major change in financial state</td>
<td>38</td>
</tr>
<tr>
<td>Mortgage or loan over $10,000</td>
<td>31</td>
</tr>
<tr>
<td>Mortgage foreclosure</td>
<td>30</td>
</tr>
<tr>
<td>Mortgage or loan less than $10,000</td>
<td>17</td>
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</table>
January 6, 1977

Thomas F. Mooney, Ed. D.
2118 Griswold
Port Huron, Michigan 48060

Dear Dr. Mooney:

By way of self-introduction, I am completing the Ed. D. in Educational Leadership and have had my proposal accepted. Dr. Robert Travers is a member of my committee. I am proposing to investigate the effects of certain dimensions of nursing intervention on the anxiety component of the postoperative pain experience. To that end I wish to use, as one measure, the DSI which you used in your research here.

Specifically, I wish to inquire about any mechanical type information you may have learned from administering the measure. You outline the procedure very comprehensively in your dissertation but I thought, before beginning, that an inquiry and any benefit of your experience might be helpful to me. Should you have an extra prototype of the actual fingerprint device, that would be especially reassuring to have.

I very much appreciate your consideration and response to this request. Thank you.

Sincerely,

Phyllis C. Nicolaou, R.N., M.S.N.
3410 Runnymede Drive
Kalamazoo, Michigan 49007
January 17, 1977

Ms. Phyllis C. Nicolaou
3410 Runnymede Drive
Kalamazoo, MI 49007

Dear Phyllis:

Thank you very much for your letter of January 6. Enclosed you will find various articles describing the D.S.I. These articles represent a relatively thorough review of the literature up through 1973. Enclosed also is a picture of the various prints to be used for scoring. Despite the somewhat cumbersome apparatus required to take the D.S.I., it really proved to be a fascinating part of my research as well as a valid indicator of changes in emotionality.

To prepare the various solutions, I suggest you contact someone in the Chemistry Department. I had worked with Dr. J. Lindsay Foote of the Biochemistry Department at W.M.U. and found him to be most helpful. If my memory serves me correctly I recall leaving some of these materials with Dr. Travers--but that was almost four years ago.

I am very much interested in your research and would hope that you would send me whatever you can from your findings. You no doubt realize that working with Dr. Travers is a unique and fortunate experience. When you see him next please give him my warmest regards and if Jan is still working for him please tell her that we have a wedding present for her (only a few months late) and will be getting it to her.

With best wishes for a successful study.

Most cordially,

Thomas F. Mooney, Ed. D.
Psychology Department

P.S. Please return these materials when you have finished with them.
January 19, 1977

Thomas F. Mooney, Ed.D.
St. Clair County Community College
232 Erie Street
Port Huron, Michigan 48060

Dear Dr. Mooney:

I received your packet of materials yesterday and am very appreciative of your prompt response and generous sharing of materials. Certainly the very detailed procedure for obtaining the Digital Sweat measure and the articles will be of necessary help.

I shall convey your messages to Dr. Travers and Jan (if she is still with him), and return the materials to you when I am finished with them. Also, I shall be happy to share any of the results of the study which might be of interest to you.

Again my sincere appreciation for your helpfulness.

Sincerely,

Phyllis C. Nicolaou
January 20, 1977

R. H. Rahe, M. D., CDR. M. C., USNR
Biochemical Correlates Division
U. S. Navy Medical Neuropsychiatric Research Unit
San Diego, California 92152

Dear Dr. Rahe:

By way of self-introduction, I am a doctoral candidate for the Ed. D. degree at Western Michigan University and also a Nurse educator. The subject of my approved proposal for the dissertation research is, "Nursing Intervention into the Anxiety Component of Postoperative Pain in Selected Adults."

I would like to use the revised Recent Life Changes Questionnaire (RLCQ) as a measure to group subjects into High and Low recent life stress categories in order to test one of my hypothesis; namely, that subjects will respond differentially to the experimental treatment on the basis of the amount of life stress they have experienced in the year prior to the present surgery.

In the book Conceptual Models for Nursing Practice edited by Riehl and Roy, you indicate in your chapter (p. 79) that a current edition of the RLCQ contains 54 life change questions and provides for obtaining a subjective life change unit score (SLCU).

May I specifically request your assistance with the following:

1. Is the most recent edition of the RLCQ with scoring instructions available for purchase? If so, can you provide me with information so that I might order sixty (60) copies of this instrument?

2. If the instrument is available from your unit, would you be able to have 60 copies sent to me and I shall remit cost by return mail?

I very much appreciate your consideration and response to this request.

Sincerely,

Phyllis C. Nicolaou, R. N., M. S. N.
3410 Runnymede Drive
Kalamazoo, Michigan 49007

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7 February 1977

Phyllis C. Nicolaou, R.N., M.S.N.
3410 Runnymede Drive
Kalamazoo, MI 49007

Dear Ms. Nicolaou:

Enclosed you will find a recent reprint which includes in the Appendix the Recent Life Changes Questionnaire. The varieties of methods for scoring the RLCQ are outlined in the enclosed instructions to investigators pages. Since I work for a government laboratory, I can neither give you nor sell you copies of this instrument. You are certainly free to produce 60 copies on your own, however, without any worry about copyright infringements.

Best of luck in your research,

RICHARD H. RAHE
CAPTAIN, MC, USNR

RHR:bln
Encl.
Appendix K

Material to Secure Medical Staff Permission
Purpose and Importance of This Proposed Research

This study is designed to measure the effect of a specific, consistently administered nursing intervention into the anxiety component of the postoperative pain experience of selected adult patients. The steps of this nursing intervention are designed to reduce the amount of anxiety the patient experiences during his postoperative pain experience and are interventions in addition to the administration of the ordered analgesic medication for pain. (Attached are the specific steps of the Nursing Intervention Treatment.)

These steps are designed to respond to the patient's need for predictability, information, a physical environment which promotes comfort, and the psychological support which the presence of a nurse offers.

The research nurse will obtain a signed consent from each patient who agrees to participate in this study. Anonymity of each subject will be maintained. Each participating patient will be asked to:

1. Complete the Life Stress Scale. This scale is designed to assess the life stresses that the patient may have experienced in the year preceding surgery.

2. Allow the Digital Sweat measure to be taken at
predetermined, periodic time intervals. This measure has been widely used in research to measure the amount of perspiration in the index finger. It appears to be a valid indicator of level of emotionality which one is experiencing.

3. Respond verbally on the fourth postoperative day to a short interview. This interview is designed to obtain the patient's thoughts and feelings about his recent pain experience.

This proposed study has been reviewed and approved by the following committees:

1. The student's Doctoral Research Committee.
2. The Human Subjects Review Committee of Western Michigan University.

The study meets these committees' standards of research methodology and standards and procedures for research involving human subjects.

Thank you for your consideration of this proposal to conduct nursing research in your hospital.

Phyllis C. Nicolaou, R.N., M.S.N.
Nursing Intervention Procedure

The treatment consists of the following sequential behaviors on the part of the nurse (for the first 72 hours postoperatively).

1. The patient is called by name and the nurse introduces herself to the patient upon his return to the unit from the recovery room. Recovery room nurse also does this.

2. The patient is told that he has a medication ordered for pain and the time schedule by which this medication may be administered.

3. When the patient expresses that he is in pain (or is observed to be so) the following procedure is followed:

   3.1 The nurse encourages the patient to describe and locate the pain/discomfort.

   3.2 The ordered analgesic is given within 5 minutes. (If the time contingencies prohibit this, the nurse so informs the patient that the medication will be given at the first allowable time and proceeds with the remainder of the steps of the procedure.)

   3.3 The patient is given a 2-3 minute backrub and repositioned for comfort.

   3.4 Linens are checked for soiling, wetness, wrinkling, and changed or straightened.

   3.5 The opportunity to void is offered.

   3.6 The dressing is observed, changed, or reinforced if necessary, and a verbal report on its condition is given to the patient.

   3.7 The intravenous infusion, naso-gastric suction, catheter, if present, are observed and a report is given to the patient.

   3.8 The nurse sits quietly with the patient, eliciting and responding to the patient's verbalizations. During
this time she asks the patient about his usual ways of dealing with pain, and reinforces and encourages his present use of those pain coping skills which are appropriate in this situation.
Appendix L

Material to Secure Nursing Staff Permission
Purpose and Importance of This Research

This study is designed to measure the effect of a specific, consistently administered nursing intervention into the anxiety component of the postoperative pain experience of selected adult patients. The steps of this nursing intervention (NIT) are designed to reduce the amount of anxiety the patient experiences during his postoperative pain experience. Research has shown that anxiety increases the intensity of the pain sensation and simultaneously decreases the tolerance level for pain.

The steps of the nursing intervention to be used in this study are not new to nurses. What is new and important is our attempt to measure the effect of nursing care on the patient's level of anxiety (and other measures of his recovery rate). Very little research has been done on the effect of psychological support by nurses during the postoperative pain experience. Additionally, little research has been done to attempt to measure the contribution of physical care measures to the psychological comfort for postoperative patients. Another important contribution, which such a study may make, is that of testing an outcome measure against which quality of nursing care can be measured.
Walk Through of Process of Proposed Research

1. Preoperative phase
   1.1 Researcher obtains signed subject permission slip.
   1.2 Researcher administers Life Stress Questionnaire to subject.
   1.3 Researcher obtains initial Digital Sweat measure of subject.
   1.4 Researcher puts subject case folder on patient's chart.
      1.4.1 DSI finger print splints
      1.4.2 Demographic data sheet
      1.4.3 Nursing Intervention Data sheet
   1.5 Staff nurse obtains Digital Sweat measure immediately preceding administration of preoperative medication on day of surgery.

2. Postoperative phase

   Each time the patient indicates he is in pain, the staff nurse implements the following procedure for the first 72 hours postoperatively:

   2.1 The patient is called by name and nurse introduces herself to the patient.

   2.2 Patient is informed of the schedule by which he may receive his medication for pain.

   When the patient expresses that he is in pain, the following procedure is followed:

   2.3 The nurse encourages the patient to describe and locate the pain.

   2.4 The ordered analgesic is given within 5 minutes.
(If the time contingencies prohibit this, the nurse so informs the patient that the medication will be given at the first allowable time and proceeds with the remainder of the steps of the procedure.)

2.5 The patient is given a 2-3 minute backrub and repositioned for comfort.

2.6 Linens are checked for soiling, wetness, wrinkling, and changed or straightened.

2.7 The opportunity to void is offered.

2.8 The dressing is observed, changed or reinforced if necessary, and a verbal report on its condition is given to the patient.

2.9 The intravenous infusion, naso-gastric suction, catheter, if present, are observed and a report is given to the patient.

2.10 The nurse sits quietly with the patient, eliciting and responding to the patient's verbalizations. During this time she asks the patient about his usual ways of dealing with pain, and reinforces and encourages his present use of those pain coping skills which are appropriate in this situation.

2.11 Nurse records each Nursing Intervention Treatment on the Nursing Intervention Data Sheet.

2.12 Immediately after administering the pain medication (within 3-5 minutes) and one-half hour after completion of each NIT, a Digital Sweat Print is obtained.

3. Fourth postoperative day

Researcher conducts a structured interview with the patient. This interview is designed to obtain the patients' retrospective feelings about his pain experience.

Before beginning the actual data gathering for this study, the researcher will personally pretest, with actual patients, all of the
equipment and materials to be used in this study for accuracy and ease of use, and teach each participating nurse how to use the data gathering and reporting measures.
Appendix M

Acknowledgment Correspondence
May 10, 1977

Ms. Patricia Middleton  
Director of Nursing  
Lakeview Community Hospital  
Paw Paw, Michigan

Dear Ms. Middleton:

The data collection phase of the Nursing Study which I have been conducting at your agency is now complete. I wish to take this opportunity to thank you and your staff for the cooperation, effort, and facilitation which you have provided for this study. One realizes that clinical nursing studies, and the nursing knowledge to which such studies ultimately contribute, could never be carried out without farsighted nurses dedicated to the delivery of quality health care.

My great personal appreciation and regard for all of the efforts you have made in behalf of this study. I shall be in touch with you when the report writing phase is completed so that the finished study may be shared with those who participated.

Sincerely,

Phyllis C. Nicolaou
May 10, 1977

Ms. Muriel O'Leary
Director of Nursing
Pipp Community Hospital
Plainwell, Michigan

Dear Ms. O'Leary:

The data collection phase of the Nursing Study which I have been conducting at your agency is now complete. I wish to take this opportunity to thank you and your staff for the cooperation, effort, and facilitation which you have provided for this study. One realizes that clinical nursing studies, and the nursing knowledge to which such studies ultimately contribute, could never be carried out without farsighted nurses dedicated to the delivery of quality health care.

My great personal appreciation and regard for all of the efforts you have made in behalf of this study. I shall be in touch with you when the report writing phase is completed so that the finished study may be shared with those who participated.

Sincerely,

Phyllis C. Nicolaou