A COMPARISON OF THE EFFECTS OF PROGRESSIVE MUSCLE RELAXATION AND GUIDED IMAGERY ON STRESS REDUCTION

by

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Submitted to the Faculty of the School of Graduate Studies of the Medical College of Georgia in Partial Fulfillment of the Requirements for the Degree of Master of Science in Nursing

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A Comparison of the Effects of Progressive Muscle Relaxation and Guided Imagery on Stress Reduction

This thesis is submitted by Sharon Ann Cumbie and has been examined and approved by an appointed committee of the School of Graduate Studies of the Medical College of Georgia.

The signatures which appear below verify the fact that all required changes have been incorporated and that the thesis has received final approval with reference to content, form, and accuracy of presentation.

This thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Science in Nursing.

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The purpose of this study was to compare the effectiveness of two relaxation techniques, progressive muscle relaxation (PMR) and guided imagery (GI), on the reduction of stress. A total of 52 subjects completed the study (PMR, N-17; GI, N-20; control, N-15). A pre-test post-test multigroup experimental design was the design method utilized in this study. Stress levels were measured using Lefebvre's Strain Questionnaire. Treatment subjects received a 45 minute training, were asked to listen to an audio tape of the relaxation technique once daily, and returned after two weeks for post-test. A repeated measures MANOVA indicated a significant interaction between the groups (F=21.09, p < .01). A Tukey HSD procedure indicated that the control group differed significantly from the two treatment groups (p < .05). The treatment groups did not differ significantly from each other. The hypothesis that GI would be more effective than PMR in reducing stress was not supported. It was concluded that neither GI nor PMR were more effective in reducing stress.

INDEX WORDS: Relaxation, Progressive Muscle Relaxation, Guided Imagery, Stress, Strain
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Dedication

This thesis is dedicated to my beloved family:

My husband, Randy, for his loving support, strength, effort, kindness, and unwavering belief in me during my graduate school process.

My precious son, Freeman, for his joy of life and open expressions of love and affection.

My dear parents, Joe and Regina Cumbie. My mother, also a nurse, who has been my mentor, role model, confidant, best friend, and most ardent supporter. My father, whose exemplary career has given me a vision of accomplishment, determination, and purpose, and who always held the highest expectations for us children.

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This thesis is also dedicated to Professor Leilee Powell Ault, my mentor and trusted friend, who has offered me knowledge, guidance, and support while facilitating my professional growth.
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CHAPTER 1
Introduction

References to stress have become ubiquitous in modern society. Stress is a pervasive element of the human condition and an increasing concern to people living in a complex society with ever-changing lifestyles (Selye, 1980). An expanding body of research suggests a relationship between stress and physical illness, mental and emotional disorders, and social dysfunction (Feuerstein, Labbe, & Kuczmarczyk, 1986; Spielberger & Sarason, 1986; Cohen & Lazarus, 1979; Korn & Johnson, 1983; Gordon, Jaffee, & Bresler, 1984; Pelletier, 1977; Everly & Rosenfeld, 1981).

Much of the research on stress to date has focused on major life stress events (Dohrenwend & Dohrenwend, 1974; Billings & Moos 1981; Holmes & Rake, 1967; Moos & Schaefer, 1986). Research by Lazarus and others indicate that daily "hassles" are more closely linked to, and may have a greater effect on, physiological and psychological components of health than do major life events (Lazarus, 1978, 1977).

With the increasing concern regarding stress-related problems, members of the health care professions are focusing greater attention on the dynamics of stress and the maintenance of health. Pelletier (1977, 1978) asserts that 50 percent to 70 percent of all our diseases are stress
related. Staying healthy in the face of stressful events is generally seen as an indication of adjustment and even optimal behavior (Kobasa, 1982). Considering the increasing complexity of our society, it is unlikely that an individual could go through life without encountering multiple life stressors at any given time.

Methods of coping with stress have received a great deal of attention in both professional and popular literature. There are many systems of stress management which include a variety of interventions. A common technique generally addressed in the literature is relaxation. Individuals possess an opposite, alternative response to stress - the relaxation response - that counteracts the effects of stress (Benson, 1976). Some techniques that elicit the relaxation response include: progressive muscle relaxation, clinically standardized relaxation technique, meditation procedures, hypnosis, yoga, biofeedback, and guided imagery. These techniques have evolved from a diverse set of theoretical frameworks, ranging from ancient principles of Eastern philosophy to more recent learning principles that form the foundation of behavioral psychotherapy (Feuerstein, Labbe, Kuczmiczyk, 1986).

The benefits of the relaxation response are well documented in the literature. Research fails to reveal whether one particular technique is more efficacious in reducing stress than another.
Statement of the Problem

Current stress management models support the use of relaxation as an intervention for stress reduction. Relaxation training is perhaps one of the most commonly used techniques in clinical work with patients experiencing stress-related health problems (Feuerstein, Labbe, & Kuczmiczyk, 1986). Two relaxation techniques, purported to be effective stress reduction methods, are progressive muscle relaxation and relaxation through the use of guided imagery. Most of the stress management literature supports the use of progressive muscle relaxation for reducing stress (Burchfield, 1985; Everly & Rosenfeld, 1981; Hamberger & Lohr, 1984; Cohen & Lazarus, 1979). An increasing number of researchers are supporting the benefits of guided imagery for healing as well as stress reduction (Gordon & Jaffe, 1984; Jaffee & Bresler, 1980; Korn & Johnson, 1983; Donovan, 1980). Much of the literature lists multiple relaxation techniques without qualification, apparently leaving the choice to the discretion of the health practitioner. Clinical studies to determine the comparative effectiveness of progressive muscle relaxation and guided imagery on the reduction of stress are limited in the current literature.

Purpose of the Study

The purpose of this study is to compare the effectiveness of two relaxation techniques, progressive muscle relaxation and guided imagery, on the reduction of
stress. A secondary purpose of the study is to examine the relationship between the reported frequency of use of the relaxation technique and the change in stress levels.

**Significance of the Study**

The multifaceted impact of stress on society is of paramount concern to health professionals and lay people alike. A variety of stress management methods are presented in the literature as effective interventions for stress reduction. Stress researchers agree on the need for some sort of relaxation technique to assist individuals in coping with stress. Though various techniques are listed, none is purported as being more effective than another, nor is there adequate research that evaluate the comparative effectiveness of specific relaxation techniques. This study, therefore, can potentially contribute to the body of stress-relaxation knowledge by comparing the effectiveness of a physical coping intervention (progressive muscle relaxation) with a cognitive coping intervention (guided imagery). Relaxation is recognized as a necessary component for stress reduction. An examination of the difference in overall effectiveness between treatment modalities would be helpful in the treatment process.

**Hypothesis**

The following hypotheses were proposed:

1. The use of guided imagery for relaxation is more effective than progressive muscle muscle relaxation in the reduction of stress.
2. There is a positive correlation between frequency of use of progressive muscle relaxation and stress reduction.

3. There is a positive correlation between frequency of use of a guided imagery relaxation technique and stress reduction.

Assumptions

1. Significant stressors may affect an individual's physical, behavioral, and cognitive functioning.

2. The use of a relaxation technique can be effective in reducing stress.

3. Individual stress responses can be measured.

4. The stress level in the majority of subjects was sufficiently high enough for them to benefit from the relaxation technique.

5. The subjects responded in an honest manner to the conditions of the study, record keeping procedure, and test instrument.

Operational Definitions

For the purpose of this study, the following terms are operationally defined:

1. Stressor: Any stimulus which evokes a relatively stereotypic set of responses, the stress response, thus requiring some form of adaptation or adjustment.

2. Stress: A complex set of responses to a stimulus, or stressor, that is a function of the relationship between the person and environment. Stress is manifest on a
physiological, cognitive, and behavioral level in an attempt to cope with a perceived threat.

3. Strain: Prolonged exposure to a stressor beyond the individual's ability to initiate effective coping strategies; a continuation of the stress response with an individual failing to meet the demand.

4. Coping: Efforts, both action-oriented and intrapsychic to manage environmental and internal demands, which tax or exceed a person's resources (Cohen & Lazarus 1979, p. 219).

5. Relaxation: The physiological state in which one is free from physical and nervous tension (Jacobsen, 1978).

6. Progressive muscle relaxation: The successive tensing and relaxing of various muscle groups throughout the entire body in a systematic fashion.

7. Imagery: Thinking in pictures (Shorr, 1976); a cognitive function which uses the memory stores related to the five senses to stimulate internal representations of external events or details.

8. Guided imagery: The process of mentally and consciously altering body function by the internal representations of events that involve the senses, thereby forming a bridge between mind and body (Achterberg & Lawlis, 1980). The term "guided" in guided imagery refers to the use of an individual, usually using a script, to direct the imagery process of another.
9. **Visualization:** The process of making visual images in the mind.

**Limitations**

Limitations that need to be considered within the context of this study include:

1. The subject population was predominantly female and, therefore, is not representative of gender ratio found in the general population.

2. Subjects who have previous experience with some form of relaxation technique may have responded differently than subjects with no previous experience.

3. The knowledge of being included in a study may have been sufficient to cause people to change their behavior, thereby obscuring the effect of the variable of interest (Hawthorne effect).

4. Volunteers were used in the selection of subjects for the study.

**Summary**

The need for relaxation therapy within the context of stress management is widely acknowledged in the literature. Many different techniques are supported as effective in the reduction of stress. The comparative effectiveness of relaxation techniques, commonly used in clinical practice, is not adequately addressed in the research literature. Progressive muscle relaxation and guided imagery were identified as two commonly used and potentially effective relaxation techniques in stress reduction. The hypothesis
was stated and terms operationally defined. The potential limitations of the study were addressed. In Chapter 2, the review of the literature relevant to the problem will be presented.
CHAPTER 2
Review of the Literature

Stress

Researchers developing the concept of stress have made significant contributions to an understanding of the nature and causes of disease. Basic assumptions about stress have been applied to biological, psychological, and social behavior.

Selye (1976) was the first to apply the term stress scientifically to medicine, developing a biochemical model of stress that focused on analysis of stress at the physiological and biochemical levels of functioning. He defines stress as "the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within a biologic system" (Selye, 1976, p. 54). Selye (1956) refers to a stressor as "that which produces stress" (p. 64). He believes that stressors occur throughout life to which people must adapt.

Selye (1976) defines stress as the nonspecific response of the body to any demand. The stress response is a total body response mediated by the nervous system, particularly the sympathetic branch of the autonomic nervous system, and the endocrine system (Korn & Johnson, 1983). These adaptive body systems are regulated by the hypothalamus.
Although the functions of the autonomic nervous system are presently known to be complex, most of the simple sympathetic effects are found in the stress response (Korn, 1983). The endocrine system response involves a secretion of adrenal cortical (cortisone type) and adrenal medullary (adrenalin type) hormones, as well as thyroid hormones. This leads to such physiological phenomena as acceleration of the heart rate, dilation of the pupils, inhibition of gastrointestinal peristalsis and secretion, inhibition of bladder emptying, constriction of gastrointestinal and urinary sphincters, diversion of blood flow into the muscles, increase in blood pressure, increase in respiratory rate, and increase in metabolic rates (Korn & Johnson, 1983).

Paramount among stress theories is Selye's (1976) description of the General Adaptation Syndrome (GAS). The GAS is a physiological response of the whole body to stress. It involves several body systems, primarily the autonomic nervous system and the endocrine, as mentioned above. The GAS consists of three stages -- the alarm reaction, the resistance stage, and the exhaustion stage (Selye, 1976). The alarm reaction involves a number of physiological changes that prepare a person to adapt to a stressor. In the resistance stage the body stabilizes to allow the person to make an adaptive response. If this response fails to alleviate the stress, the person enters the exhaustion stage when he no longer has sufficient energy to attempt
adaptation. Selye (1956) hypothesized that exhaustion occurred when stress exceeds the normal eustress level and becomes damaging or unpleasant, distress. Allanach (1988) states that the burnout syndrome described in the literature is "reminiscent of Selye's concept of exhaustion" (p. 75).

The stress experience can be conceptualized as being composed of two major components: stressors and stress responses. Stressors represent stimulus events requiring some form of adaptation or adjustment. Stressors usually evoke a stereotypic set of responses, the stress response. The circular nature of this definition is supported in the literature. Feuerstein, Labbe, and Kuczmiczyk (1986) state that a complex feedback system exists between stressor and the stress response, with each influencing the other.

The stress response can be conceptually divided into three components: physiological, cognitive, and behavioral. The physiological response is complex as was discussed briefly in the preceding section. A view of the cognitive and behavioral components of the stress response provide greater understanding of the complexities of stress.

The cognitive component of the stress response includes fluctuation in mood state (ranging from elation to tension), depression, difficulty in concentrating, vigor, and fatigue (Korn & Johnson, 1983; Gordon, Jaffee, & Bresler, 1984). This component generally represents a conscious appraisal of the stimulus, thus indicating how the individual evaluates or perceives the situation (Feuerstein, Labbe, &
Kuczmiczynck, 1986). Pearlin and Schooler (1978) gave the following examples of cognitive coping responses: positive comparisons (e.g. "We're all in the same boat; I thought I had it bad, look at him") and selective ignoring (e.g. the devaluation of money in response to household economic strain).

The behavioral component of the stress response represents the actual overt behavior of the individual to the stressors. This response can vary from extreme violence to hostility to avoidance and withdrawal (Feuerstein, Labbe, & Kuczmiczynck, 1986). Impatience, heightened competitiveness, and sexual dysfunction have also been described in the literature as behavioral manifestations of the stress response (Burchfield, 1985; Everly & Rosenfeld, 1981; Korn & Johnson, 1983).

Stress is neither good nor bad (Selye, 1976). It is beneficial when it enables the individual to survive a potentially harmful situation or when it provides the level of stress necessary for functioning. Stress becomes distress when it reaches excessive levels, is harmful, and particularly when it is repeated or prolonged. Health care professionals are becoming increasingly aware of the relationship between psychological stress and the onset, course, and outcome of medical illness (Burchfield, 1985; Korn & Johnson, 1983). The more intense and longer a stress situation, the higher risk for a negative health outcome.
Korn and Johnson (1983) state that "...all diseases are stress-related because stress and its associated influences on the mind-body axis tends to leave us, for multiple reasons, in a situation that is vulnerable to the development of a disease" (p. 30). They propose that stress is responsible for 50 percent to 100 percent of all diseases, and for a great majority of nonspecific symptoms unrelated to specific disease processes such as anxiety, apprehension, headaches, and nonspecific pain.

**Stress and Nursing**

In studying the stress response, it is important to select a population in which subjects are known to manifest significantly high levels of stress (Lazarus, 1984). Stress and burnout among hospital nurses is a concern expressed in the literature (Albrecht, 1982; Scully, 1981; Pines, 1986, Laffrey, 1985). Nursing service administrators are beginning to acknowledge the need for mental health intervention for staff nurses, by increasingly seeking the service of mental health consultants (Kirby, 1984). Helping others and being needed by others offer important intrinsic rewards for all health-oriented professionals. Career satisfaction comes from numerous and various sources including self-actualization, exposure to a wide range of human experiences, socially useful work, challenging intellectual pursuits, and usually a reliable income (Roeske, 1986).
Many studies in the current literature focus on stress among nurses in the hospital setting (Ivancevich & Matteson, 1980; Gray-Toft & Anderson, 1985; Revicki & May, 1989). Identified stressors include: constant exposure to death and suffering; having to deal with the emotional demands of patients and their families; inadequate staffing and work overload; irregular work schedules; role ambiguity and multiple conflicting role expectations; lack of decision-making autonomy; and conflicts with administrators, physicians, and other nurses. Such job-related stressors have been found to be associated with a variety of negative consequences for staff nurses, including job dissatisfaction, burnout, absenteeism, depression, substance abuse, obesity, physical illness, and turnover (Hinshaw & Atwood, 1984; McCranie, Lambert, & Lambert, 1987; Albrecht, 1982; Pines, 1986; Bissell & Haberman, 1984).

The Relaxation Response

Relaxation refers to that state in which an individual is free from physiological and nervous tension (Jacobsen, 1938). The relaxation response is believed to be an integrated hypothalamic response that results in generalized decreased sympathetic nervous system activity (Benson, 1976; Benson, Beary, & Carol, 1974) and consists of changes counter to those of the stress response (Benson, 1976). Most individuals have experienced a self-induced altered state of consciousness, reported as feelings of increased
creativity and a sense of inner peace (Feuerstein, Labbe, & Kuczmiczyk, 1986). Benson (1976) noted that the physiological changes associated with the so-called altered state, or relaxation response, are consistent with a generalized decrease in sympathetic activity and are distinctly different from the physiological changes recorded during quiet sitting or sleep.

The major physiological elements of the relaxation response were first defined in humans during the practice of transcendental meditation (Benson, 1976). The findings from these studies included: decreased oxygen consumption, increased carbon dioxide elimination, decreases in the heart rate and respiratory rate. Benson (1976) reported four basic elements as prerequisites for eliciting the relaxation response: a mental device to facilitate the conscious mind in shifting from logical, externally oriented thought, to internal, subconscious thought; a passive attitude; decreased muscle tones, e.g. a comfortable, relaxed position; and a quiet environment.

The effects of the relaxation response on reducing autonomic functions and sympathetic responsivity are documented in the scientific literature (Bradley & McCanne, 1981; Korn & Johnson, 1983). Many techniques exist that are effective in the elicitation of the relaxation response. As previously discussed in Chapter 1, this study will focus on two specific relaxation techniques, progressive muscle relaxation and guided imagery.
Progressive Muscle Relaxation

Progressive muscle relaxation, as a technique to elicit the relaxation response, originated in the late 1920s with the work of Edmund Jacobson. Jacobson (1978) proposed that the main mechanisms influencing relaxation lie with the patient's ability to perceive the differences between tension and relaxation. Each time a muscle contracts, the receptors within the muscle are activated. In turn, these activated receptors produce a series of neural impulses that are transmitted to the brain along afferent neural fibers. Tension may be viewed as the result of this generation and conductance of afferent neural impulses. When muscle contraction occurs, neural impulses are transmitted to the brain and instigate complex CNS activity. Subsequently, neural impulses return to the muscles along efferent neural fibers and produce further muscle contraction. As a result, additional neural impulses are directed to and from the brain along numerous neuromuscular circuits throughout the body. By teaching the subject to recognize excessive contraction of the skeletal muscles, one is then able to teach the patient how to relax specific muscle groups to relieve tension (Jacobson, 1978, 1938). Overall, the specific physiological effects of progressive muscular relaxation training are less understood than the effects of certain other stress reduction techniques (i.e., the Benson relaxation response) (Korn & Johnson, 1983, Benson, 1976).
Progressive muscular relaxation involves the successive tensing and relaxing of various muscle groups. Throughout training, the subject typically sits or reclines in a comfortable chair in a quiet, dimly lit room with closed eyes. In order to enhance the relaxation effect, the practitioner speaks in a slow and quiet tone of voice and usually has the patient successively tense and relax the following muscle groups: hands and forearms, upper arms (biceps), wrists, forehead, eyes, mouth, neck, shoulders, chest, stomach, buttocks, thighs, calves, and feet. The progressive relaxation method should be tailored to the needs of each individual, with one to two practice sessions per day. The use of audiotapes reviewing the relaxation procedure are commonly employed in training subjects in the use of progressive muscle relaxation (Jacobson, 1978).

**Imagery**

Imagery is the basis of our thought processes. In the development of the individual, the earliest forms of cognition seem to be visual in nature (Samuels & Samuels, 1975). Words develop later as a means of describing both external and internal realities. Pictures or images represent patterns or symbols. Words are necessary to explain the meaning of these symbols and are the best available tool for making thoughts and ideas known to others (Wilber, 1977).
In the last hundred years specialists in different fields have begun to rediscover the existence and meaning of visualization. Historians, religious scholars, archaeologists, physicians, and psychologists have begun to study the nature of the inner image as it relates to their area of specialization (Samuels & Samuels, 1975).

Modern medicine is also in the process of rediscovering visualization as a healing tool (Korn & Johnson, 1983; Jaffee & Bresler, 1980; Achterberg & Lawlis, 1982). An increasing number of people are researching and developing techniques for healing which use visualization (Mast, 1986). Mast (1986) states that there is a need for further research into the structural and functional properties of imagery. Research is also needed to evaluate the ways in which subject characteristics, clinical setting, and instructional procedures influence and can be manipulated to affect imagery outcomes.

Mental images, or internal representations of events that involve the senses, form a bridge between mind and body, and provide a method for mentally and consciously altering body function (Achterberg & Lawlis, 1982).

The rationale for the effect of imagery is rooted in psychophysiological research which suggests that the nervous system can be contacted by two fundamentally different types of language: metaphoric and verbal (Jaffee & Bresler, 1980). These languages correlate with brain hemispheres. Imagery is primarily a right brain metaphorical method of


communication which is directly linked with the unconscious and physical functions of the nervous system. There is no physical symptom or illness that is not affected to some degree by the mind. Healing can be enhanced by positive and helpful images and expectations, and it can be hampered and slowed by depression, hopelessness, and fatigue (Achterberg & Lawlis, 1982; Holt, 1964; Jaffee & Bresler, 1980). The way a person uses his or her mind is a critical factor in the development of physical and mental health.

Relaxation, Imagery, and Health

The therapeutic effects of relaxation and imagery are increasingly addressed in the literature. Relaxation and imagery are reported to be efficacious treatment modalities in both physiological and psychological dysfunction. Relaxation and guided imagery can be used to mobilize the latent, inner powers of an individual and to optimize those subtle primordial forces which aid in mediating stress and in the promotion of health (Korn & Johnson, 1983).

Relaxation and imagery are reported to reduce the effects of stress on the body (Girdano & Everly, 1979; Benson, 1975; Korn & Johnson, 1983; King, 1987; Achterberg & Lawlis, 1982; Mast, 1986) to be effective as an adjunct treatment for hypertension (Hoelscher, Lichstein, & Rosenthal, 1986; Jacob et al., 1986; Patel & Dately, 1987), and asthma (Freedberg, Hoffman, & Light, 1987). Several studies indicate that relaxation, both with and without
guided imagery, is effective in reducing the subjective perception and physiologic response to pain (Bresler & Trubo, 1979; Johnson, Rice, Fuller, & Endress, 1978; Korn & Johnson, 1983; Cotanch & Strom, 1987; Miller, 1987).

The techniques of hypnosis, relaxation, and imagery have been used by psychotherapists since the time of Freud for diverse reasons and conditions (Korn & Johnson, 1983). Samuels and Samuels (1975) report the use of relaxation and imagery as a therapeutic modality by prominent psychotherapists including Beck, Lerner, Jung, and Wolpe.

The current literature indicates that relaxation and guided imagery are effective in psychological disorders such as depression (Reynolds & Coats, 1986; Beck, 1979), anger and hostility (Hazaleus & Deffenbacher, 1987; Novaco, 1975; Schlichter & Horan, 1981), anxiety (King, 1987), and postpartum distress (Haloren & Passman, 1985).

Warnings appear in the literature against suggesting specific images for individuals (King, 1987). This is due to the possibility that specifically suggested images might have unpleasant meanings to subjects (Donovan, 1980). Gagan (1984) suggested that images might be changed within the person. Instead of bringing comfort and relaxation, as was the intention, the subject might experience fright or anxiety. Korn and Johnson (1983) suggest the use of vague "suggestive" images (e.g., "imagine the most peaceful, relaxing place you can; see the sky..." etc.), thus allowing the subject to control for specificity.
The use of imagery is also not recommended for people who are pre-psychotic or psychotic, who suffered from organic brain syndrome, or who have difficulty in concentrating (Assagioli, 1976). Donovan (1980) advised caution with the use of guided imagery in persons who had a history of severe depression, psychosis, or cardiac irregularities.

The literature regarding risks is inconsistent and these risk factors need further study. Though Donovan (1980), for example, cautions against the use of relaxation and imagery with persons having a history of cardiac irregularities, Benson (1976) and his associates have documented evidence supporting a decrease in premature ventricular contractions (cardiac irregularities) through the use of the relaxation response in patients with ischemic heart disease.

In summary, the literature indicates that health professionals from all disciplines are beginning to utilize relaxation and imagery to help their clients more effectively help themselves. Imagery is the natural language of the unconscious and is a major key to understanding and directing its operations. Though imagery and insight techniques are not a replacement for either appropriate professional care or physical self-care, the visualization process offers a potent medium for self-regulation, self-exploration, self-knowledge and, in
essence, self-actualization. It is a process that can engender and nurture healing of the whole person.
CHAPTER 3

Conceptual Framework

Interactional Model of Stress

The model of stress that appears to be most useful as a conceptual framework for this study is the Interactional Model. Interactional models not only consider both stimulus and response aspects of stress, but also propose that stress occurs through a particular relationship between the person and the environment (Cox, 1978). The individual is considered an active agent in the stress process, and it is postulated that self-regulation of cognitive, behavioral, and emotional coping strategies influence the impact of a stressor. The interactional models, therefore, focus on the transactional and ecological nature of stress as well as on the individual's cognitive and psychological evaluation of the stressor (Lazarus, 1980; Cox & Mackay, 1978). The interactional model of stress, called the transactional model, described by Cox and Mackay (1978) was used in the conceptual framework for this study. This model identifies five discernible stages (see Figure 1). The first stage identifies the existence of demands or stressors placed on the individual. Two types of demands are identified: internal and external. The internal demands relate to the physical and psychological needs of the individual and are
Figure 1. Transactional Model of Stress (Cox, 1978, p. 19).
important factors in the determination of subsequent behavior. The external demands represent potential sources of stress that are a function of environmental factors.

The second stage consists of the individual's perception of internal and external demands and the perception of his or her ability to meet these demands. Stress occurs when an imbalance exists between perceived demand and perceived coping ability. This imbalance results in the stress response.

The third stage of the model represents the actual stress response, which is a method of coping with the perceived stressor. The subjective emotional experience of stress is accompanied by cognitive, behavioral, and physiological changes that attempt to reduce the demand.

The fourth stage is concerned with both the actual and perceived consequences of the coping responses. The stress experience may continue to occur if the individual fails to meet the demand or if negative consequences resulting from failure are anticipated.

The fifth stage consists of a feedback system that may shape events at any point in the system. Feedback of appropriate responses can, therefore, enhance the individual's ability to cope with the demand. Conversely, feedback of inappropriate responses may serve to intensify the stress response and cause an increased demand on the system.
Stress and Coping

Psychological stress consists of demands that exceed the available resources as appraised by the individual involved (Lazarus, 1974). Once an individual perceives an event as stressful, coping responses are mobilized. According to Lazarus (1980, 1978), coping responses are either aimed at managing the problem evoked by a stressful life event, or at regulating the internal state or emotions provoked by the event. Coping is further defined as "efforts, both action-oriented and intrapsychic, to manage (that is, master, tolerate, reduce, minimize) environmental and internal demands, and conflicts among them, which tax or exceed a person's resources" (Cohen & Lazarus, 1979, p. 219). Coping can occur prior to a stressful event - anticipatory coping - or in response to confrontation with a perceived threat.

Researchers are becoming increasingly concerned with the definition, existence, and function of cognitive modulators in the stress response (Korn & Johnson, 1983). The transactional model of stress, presented previously, emphasizes the person's cognitive appraisal of the stressor and the response to the stressor as important factors in the overall effects of stress and also on future stress responses.

One type of cognitive modulator of the stress response that has received considerable attention is perceived control. Perceived control refers to the extent events or
the environment are interpreted by the individual as under personal control. A study by Glass and Singer (1972) suggests that people prefer activities in which they are given control, whether or not they actually use that control. Aftereffects of stress are thought to occur following uncontrollable stressors, not controllable ones (Cohen, 1980). It has been argued that the illusion of control rather than actual control over the aversive stimulus reduces the impact of the stressor (Johnson & Sarason, 1979).

In summary, a framework for illustrating an interactional model of stress has been presented. A conceptualization of coping was discussed, with particular attention being given to a specific cognitive coping response, perceived control. The transactional model (Cox, 1975) emphasizes the individual's cognitive appraisal of both the demand (stressor) and the ability to meet that demand (coping). Lazarus (1980) proposes that perceived personal control is an important component to effective coping through positive cognitive appraisal of the individual's ability to meet a demand. The individual has the potential to act as a positive agent in the stress response by self-regulation of the cognitive appraisal process. Feedback of appropriate cognitive appraisal responses can enhance the individual's ability to cope with the demand by the enhancement of their cognitive perception of control.
The combined theoretical framework of the interactional stress model and cognitive coping provides an organizational structure for the study. This writer views guided imagery as a cognitive coping strategy which may be effective in enhancing the reappraisal process described in the transactional model. The specific guided imagery developed for this study uses images that suggest an increase in personal control and a diminishment of perceived demand.

Progressive muscle relaxation initiates the relaxation response through a progressive process of muscle tensing and relaxing. The main mechanisms influencing relaxation lie with the individual's ability to perceive the differences between tension and relaxation. Progressive muscle relaxation differs in practice from the specific guided imagery developed for this study in that it does not suggest, or guide, the individual through a process of reappraisal. The guided imagery script may facilitate the reappraisal process, thereby resulting in an increased sense of personal control, a decreased perception of demand, with a resulting decrease in stress level.
Figure 2. Adaptation of Transactional Model of Stress (Cox, 1978, p. 19) to illustrate effect of guided imagery intervention for stress reduction.
Figure 2. Adaptation of Transactional Model of Stress (Cox, 1978, p. 19). to illustrate effect of guided imagery intervention for stress reduction.
CHAPTER 4
Methodology

Design

The pretest-posttest multigroup experimental design was the design method utilized in this study.

\[
\begin{align*}
R & \quad 0 & \quad X_1 & \quad 0 \\
R & \quad 0 & \quad X_2 & \quad 0 \\
R & \quad 0 & \quad 0 & \quad 0
\end{align*}
\]

This design was considered the most appropriate for the study as it allows for manipulation of the independent variable (relaxation technique) and subsequent observation of the effect of the independent variable on the dependent variable (change in stress level) (Polit & Hungler, 1987). The multigroup design allows for a study with two (or more) treatment conditions and one control condition. Volunteer subjects were randomly assigned to either one treatment group or to a waiting-list control group.

Development of the Guided Imagery Script

The development of the specific guided imagery script (Appendix E) to be used in this study was based on a review of literature related to the conceptual framework of the study. Both the interactional model of stress and Lazarus' (1974) theories of cognitive coping strategies provided an appropriate developmental framework.
In the interactional model of stress proposed by Cox (1978), the individual is considered an active agent in the stress process, and that self-regulation of cognitive, behavioral, and emotional coping strategies influence the impact of a stressor. Another important postulate of this model relevant to the development of the guided imagery script was the consideration of the second stage of the stress process described by Cox (1978). He hypothesized that the degree of the stress response is dependent on the individual's perception, or cognitive appraisal, of internal and external demands and of his or her ability to meet these demands. In the "feedback loop" of the interactional stress model, the individual provides input into the ongoing cognitive appraisal process. Cox (1978) states that the feedback loop may shape events at any point in the system. Feedback of appropriate responses is said to enhance the individual's ability to cope with the demand.

Lazarus (1984) states that cognitive appraisal can be most readily understood as "the process of categorizing an encounter, and its facets, with respect to its significance for well-being" (p. 31). One component of the coping process discussed by Lazarus is cognitive coping responses.

Cognitive coping responses are defined as "constantly changing cognitive efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). The context in which the individual views his or her
capabilities effects the outcome of personal events. Viewing oneself positively can be regarded as a very important psychological resource for coping. A general belief that outcomes are controllable, i.e. that one has the power to affect such outcomes, can greatly influence one's ability to cope with stress (Anderson, 1977; Strickland, 1978; Lazarus, 1984). Perceived control can, therefore, be classified as one type of cognitive modulator of the stress response.

In summary, the elements of the conceptual framework have been reviewed for their relevancy to the development of a specific guided imagery to be used for the reduction of stress.

**Testing the Script**

The guided imagery script for this study was presented to multiple groups over a six month period to validate the script as being comfortable for participants and to identify areas in need of revision. The groups whom were presented the guided imagery script as a form of relaxation exercise included: graduate nurses preparing for a retake of the national board exam; a monthly management meeting of head nurses, assistant head nurses, directors and administrator of nursing service; two classes of high school students (N=46) from a local school; and participants of a conference sponsored by the American Heart Association, "A Multidisciplinary Approach to Cardiovascular Care", for
health care professionals involved in cardiovascular care, with approximately 75 persons in attendance.

Each time the script was presented, participants were asked to evaluate the following: their subjective experience; any areas that may have been frightening or uncomfortable; areas that were especially pleasing; suggested areas for changes; and any additional comments. The script was revised and refined in an ongoing process of participant evaluation not for validation of effectiveness but, rather, for the purpose of establishing participant comfort with the particular images used in the script (Appendix E).

**Target Population**

The target population for this study consisted of all nurses, R.N. AND L.P.N., employed in a large community hospital in the southeastern United States who volunteered for the study. The design of the study called for at least 15 minimal sample size for each group for adequate statistical analysis.

**Setting**

The setting for this study was a 700-bed community hospital, having at least 25 different inpatient units which include services in the following areas: oncology, neurology, medical-surgical, telemetry, mental health, alcohol and drug rehabilitation, diabetic teaching, pediatric, obstetrics-gynecology, operating room, recovery, and open heart recovery. Patient acuity is high with
patient census remaining constant between 93 percent and 100 percent. There are approximately 547 staff nurses, 25 head nurses, and 62 assistant head nurses.

**Instrument**

Instruments developed to measure stress as a response have most often emphasized physical symptoms and neglected the contributions of behavioral and cognitive components (Lefebvre & Sandford, 1985). Several models of stress emphasize the occurrence of multiple responses in reaction to a stressor, including cognitive, behavioral, and physiological responses. The instrument used to measure stress in the context of this study was the Strain Questionnaire (Lefebvre & Sandford, 1985), which is a multi-modal questionnaire for stress measurement (Appendix G).

The development of the Strain Questionnaire (SQ) was "guided by the conceptualization of stress, or strain, as a syndrome of physical, behavioral, and cognitive symptoms that are elicited, to varying degrees, by the environmental demands upon the individual" (Lefebvre & Sandford, 1985, p. 70). An item pool of 48 physical, behavioral, and cognitive signs of strain were generated from Selye (1976) and Lefebvre and Lawlis (1979). This instrument provides for a total strain score and three subscale scores for physical, behavioral, and cognitive symptoms.

The resulting 48 items were presented to four clinical psychology doctoral candidates with experience in evaluating and treating stress disorders. Each was asked to sort the
items into either physical, behavioral, or cognitive categories. The resulting sorts produced inter-rater reliabilities for each item ranging from .88 to 1.00 across the six possible rater pairings.

After construction of the Strain Questionnaire (SQ), it was subsequently completed by 285 males and 127 females (n=412) with a mean age of 33 years (range: 17-58 years). Two groups, insurance agents (45) and elementary/secondary teachers (38) completed the questionnaire prior to their participation in stress management workshops. The questionnaire was also administered to graduate business students (119) and naval engineers (110) as part of a battery of instruments assessing health-related behaviors and attitudes. The fifth group comprised of 100 undergraduate students enrolled in an introductory psychology course (Lefebvre & Sandford, 1985).

Descriptive statistics reported by Lefebvre and Sandford (1985) for the total score and each of the three subscales are shown in Table 1. Inter-item, item-SQ, and item-scale correlation were computed with the specific item omitted from the SQ and each scale's total score. Among items, no correlations were found that exceeded r=.60, indicating little overlap of item content. All item-total correlations were significant with the exception of one item (use of alcohol, r=.06). Three other items showed low correlations with the total SQ score: smoking (r=.11, p <.05), use of recreational drugs (r=.12, p <.01), and use of
Table 1

Descriptive Statistics for the Strain Questionnaire (N=412)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total SQ</td>
<td>86.31</td>
<td>25.00</td>
<td>48-189/240*</td>
</tr>
<tr>
<td>Physical</td>
<td>50.03</td>
<td>15.96</td>
<td>28-116/140</td>
</tr>
<tr>
<td>Behavioral</td>
<td>22.44</td>
<td>5.98</td>
<td>12-44/60</td>
</tr>
<tr>
<td>Cognitive</td>
<td>13.84</td>
<td>5.45</td>
<td>8-37/40</td>
</tr>
</tbody>
</table>

*The last number indicates the maximum possible score.

prescription drugs (r=.18, p < .001); all other correlations fell between r=.35 and .64.

The Spearman-Brown split-half reliability and inter-item consistency (Cronbach's alpha) values for the SQ and the three component scales are shown in Table 2. The test-retest correlation for the SQ and its scales are reported by Lefebvre and Sandford (1985) for 68 of the graduate business students who completed a second SQ four weeks after the first administration. Split-half reliabilities ranged from .62 (behavioral subscale) to .88 (SQ). Cronbach's alpha values were slightly higher, ranging from .71 to .94. The test-retest reliabilities were quite similar for the SQ and the subscales, with a range of .73 to .79.
Table 2

Split-half Reliability and Inter-item Consistency Values for the SQ and Three Component Scales (N=68)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Split-half</th>
<th>Alpha</th>
<th>Test-retest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total SQ</td>
<td>.88</td>
<td>.94</td>
<td>.79</td>
</tr>
<tr>
<td>Physical</td>
<td>.87</td>
<td>.92</td>
<td>.75</td>
</tr>
<tr>
<td>Behavioral</td>
<td>.62</td>
<td>.71</td>
<td>.77</td>
</tr>
<tr>
<td>Cognitive</td>
<td>.86</td>
<td>.86</td>
<td>.73</td>
</tr>
</tbody>
</table>

The correlation between SQ, its three subscales, and the Beck Depression Inventory (BDI) were reported by Lefebvre and Sandford (1985). From the sample of 68 business students previously noted: BDI-SQ r=.71; BDI-physical r=.64, BDI-behavioral r=.63, and BDI-cognitive r=.78 (p's <.001). These data indicate a moderate degree of shared variance by the two instruments which is primarily attributed to the overlap of cognitive symptoms.

**Demographic Data Questionnaire**

Demographic data was obtained from each of the subjects to elicit descriptive characteristics about the population (Appendix C). The demographic data included the following information: age, gender, race, marital status, and education.
**Procedure**

Head nurses on each unit in the health care facility were contacted for permission to solicit volunteers for the study from the unit. Head nurses, assistant head nurses, and nursing administrators were also eligible to volunteer for the study. Staff nurses were contacted during daily report, given a brief oral description of the study, a written description (Appendix A), and asked to submit their names if they were interested in participating in the study.

Volunteers were randomly assigned to three groups: Group A, the experimental progressive muscle relaxation group; Group B, the experimental guided imagery group; or Group C, the waiting-list control group. Randomization of subjects was performed by folding participation forms to obscure the name, shuffling all forms together, and then placing each form sequentially from total forms into three equal groups. Group Assignment, Groups 1, 2, and 3, was then made. After the completion of data collection, Group C will be offered an opportunity for relaxation training. Groups will be limited to 20 participants.

The volunteers who choose to participate in the study were given a letter acknowledging their acceptance and group assignment and a copy of the demographic questionnaire (Appendix C) to be filled out prior to the first introductory session. Volunteers were given a final schedule of dates and times of the appropriate training.
sessions. Times were arranged to accommodate the various shifts.

Each participant attended an initial introductory session lasting 45 minutes. The participant returned in two weeks for one final session in order to complete the Strain Questionnaire.

After the introductory session, each participant was given a tape of the relaxation technique appropriate to their group assignment. The participant was expected to practice the relaxation technique by listening to the tape once per day and documenting on a provided flow sheet (Appendix F) the actual number of times he or she listens to the tape in the two week period.

Following the completion of the study, each participant was given a copy of a tape, which contained the progressive muscle relaxation on one side and the guided imagery on the other, as a token of appreciation. All responses on the questionnaires were anonymous. Volunteers signed a consent form prior to participation in the study (Appendix B).

**Human Safeguards**

Permission to conduct the study was obtained from the Associate Director of Nursing (Appendix I) of the hospital setting for the study. Participation in the study was voluntary and confidentiality was maintained. The respondent's identification for purposes of the pretest-posttest score comparison was via codes selected by them and known only to them.
The study proposal was submitted to the Human Assurance Committee of the Medical College of Georgia (Appendix H) and at the hospital used for the study (Appendix I).
CHAPTER 5

Analysis of Data

The dependent variable in this study was change in the level of stress, with the independent variable being group treatment status. The data collected in this study were analyzed using descriptive, correlational, and inferential statistics. Descriptive statistics were used to describe and synthesize data from the demographic questionnaire, providing information concerning the subject population characteristics. The Pearson product moment correlation coefficient was employed to examine the intercorrelations between frequency of use of a relaxation technique and reduction of stress. Inferential statistics were used to provide a means for drawing conclusions about a population (Polit & Hungler, 1987) and included the following statistical tests: t-test, repeated measures MANOVA, and analysis of variance.

Sample

A total of 64 subjects volunteered to participate in the study, with 52 subjects completing the study. Subjects were distributed among the three study groups: progressive muscle relaxation (PMR), guided imagery (GI), and waiting-list control. Of the subjects who completed the study, 13 were male and 39 female. Subjects ranged in age from 22
years to 52 years, with a mean age of 34 years. Regarding marital status: 14 had never been married, 20 married, 17 divorced, and 1 widowed. One was Asian, 14 Black, and 37 Caucasian. Regarding educational status: 6 were masters prepared nurses, 22 baccalaureate, 19 associate degree, and 5 vocational (see Table 3).

Table 3

Demographic Characteristics of Study Sample (N=52)

<table>
<thead>
<tr>
<th>Category</th>
<th>Progressive Muscle Relaxation</th>
<th>Guided Imagery</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>11</td>
<td>13</td>
<td>39</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30 years</td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>30-40 years</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>40-50 years</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>&gt; 50 years</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Married</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Divorced</td>
<td>5</td>
<td>7</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

continued
Table 3 (cont'd)

Demographic Characteristics of Study Sample (N=52)

<table>
<thead>
<tr>
<th>Category</th>
<th>Progressive Muscle Relaxation</th>
<th>Guided Imagery</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Black</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Caucasian</td>
<td>10</td>
<td>16</td>
<td>11</td>
<td>37</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational (LPN)</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Baccalaureate</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Masters (MSN)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Subjects who failed to complete the study were as follows: progressive muscle relaxation, n=4; guided imagery, n=2; waiting-list control, n=6. A t-test was performed to compare the study group with subjects who did not complete the study. The results indicated no significant difference of mean pretest scores on the Strain Questionnaire between the two groups.

Hypotheses Testing

Hypothesis 1. The use of guided imagery for relaxation is more effective than progressive muscle relaxation in the
reduction of stress. Descriptive statistics related to pretest, posttest, and change scores on the Strain Questionnaire for the three study groups are listed in Table 4.

Table 4
Descriptive Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>PMR</td>
<td>17</td>
<td>80.9</td>
<td>16.4</td>
</tr>
<tr>
<td>GI</td>
<td>20</td>
<td>85.3</td>
<td>15.6</td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>80.3</td>
<td>18.4</td>
</tr>
</tbody>
</table>

A repeated measures MANOVA was used to test the significance of the difference between pretest and posttest scores and to test for interaction between groups. The results indicated that there was a significant difference between pretest and posttest scores ($F (596.16) = 9.53$, $p < .01$) and that there was a significant interaction between the groups ($F (2640.14) = 21.09$, $p < .01$) (see Table 5).

A Tukey HSD procedure was performed to determine exactly where the significant differences were after a significant $F$ ratio was obtained using the MANOVA. Analysis
Table 5
Repeated Measures Multivariate Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>F</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest-Posttest</td>
<td>9.527</td>
<td>.003</td>
</tr>
<tr>
<td>Group by Training</td>
<td>21.096</td>
<td>.00</td>
</tr>
</tbody>
</table>

(p < .01)

indicated that the control group (Group 3) differed significantly from the two treatment groups (Groups 1 and 2) (p < .05). The treatment groups, progressive muscle relaxation and guided imagery, did not differ significantly from each other (see Table 6).

Table 6
Tukey HSD Procedure

<table>
<thead>
<tr>
<th>Mean</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>-13.6</td>
<td>Group 2 (GI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-8.00</td>
<td>Group 1 (PMR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.6</td>
<td>Group 3 (C)</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

*Denoted pairs of groups significantly different at the .05 level.
The hypothesis that guided imagery would be more effective than progressive muscle relaxation in reducing stress was rejected.

Hypothesis 2. There is a positive correlation between frequency of use of progressive muscle relaxation and stress reduction.

A Pearson product moment correlation was used to test for a relationship between frequency of use of progressive muscle relaxation and reduction in stress. The results indicated that there was a significant relationship for the progressive muscle relaxation group (r = .6293, p < .01). The second hypothesis that there would be a positive relationship between frequency of use of progressive muscle relaxation and stress reduction was supported (see Table 7).

Hypothesis 3. There is a positive correlation between frequency of use of a guided imagery relaxation technique and stress reduction.

A Pearson product moment correlation was used to test for a relationship between frequency of use of the guided imagery technique and reduction in stress. The results failed to establish a significant relationship between use of the technique and stress reduction with the guided imagery group. The third hypothesis that there would be a positive relationship between frequency of use of the guided imagery technique and stress reduction was rejected (see Table 7).
Table 7

Pearson Product-Moment Correlations Between Frequency of Use of a Relaxation technique and Stress Reduction

<table>
<thead>
<tr>
<th>Frequency of Use by Technique</th>
<th>Change in Stress Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation</td>
<td>-.6293 (p = .003)</td>
</tr>
<tr>
<td>Guided Imagery</td>
<td>-.2823 (p = .114)</td>
</tr>
</tbody>
</table>

* p < .01
CHAPTER 6
Discussion, Conclusions, Implications, Recommendations, and Summary

Discussion

Methods of coping with stress have received much attention in the literature. A technique generally proposed within the framework of stress management as being effective in reducing stress is the relaxation response. The benefits of the relaxation response are well documented in the literature. Research fails to reveal whether one particular technique is more effective in reducing stress than another. Much of the literature lists multiple relaxation techniques without qualification of effectiveness or indications for use of a specific technique. This study sought to compare the effectiveness of two relaxation techniques, progressive muscle relaxation and guided imagery, on the reduction of stress. This study also included an examination of the relationship between frequency of use of a relaxation technique on stress reduction.

The results of the present research indicated that there was a significant difference in stress reduction between the treatment groups and the control group. The research failed to indicate a significant difference between the two treatment groups. The hypothesis that guided
imagery would be more effective than progressive muscle relaxation in reducing stress was rejected. The research finding that regular use of a relaxation technique is effective in reducing stress is supported by the current literature on stress intervention and management. The researcher, therefore, expected that there would be a significant reduction in stress among the treatment groups as compared with the control group. The results of this study thus indicate that the use of either technique of relaxation are effective in reducing stress. The use of a specific technique could then be left to the individual preference of the practitioner or the client. Although not significant statistically, it was noted that there was an interaction between the two treatment groups. The mean change score for the guided imagery group being -13.6; the progressive muscle relaxation, -8.0. It is possible that a repeat study using a larger subject population would yield a statistically significant interaction.

The guided imagery script, written and developed by the researcher, had not been previously tested for its effectiveness in reducing stress. The results of the study validate the script as being effective when compared to a control group and as effective as progressive muscle relaxation in the reduction of stress. The script was written within the conceptual framework of an interactional model of stress and coping. The focus of the images used within the guided imagery script was on the cognitive
appraisal/reappraisal process, with the subsequent perceived increase in personal control and decrease in demand. It may also be useful to test the efficacy of this specific script as a treatment for enhancing perceived control or coping, or for reducing anxiety.

The Strain Questionnaire has been shown to be a valid and reliable measure of strain (stress). This researcher considered the inclusion of physical, behavioral, and cognitive signs and symptoms of stress on the questionnaire to be a strength over other instruments available for the measures of stress. Further studies need to be performed to test the effectiveness of the Strain Questionnaire against other instruments utilized in the measure of stress. Additional studies are also needed to demonstrate the sensitivity of the Strain Questionnaire to reduction in strain (stress).

Additional findings in the study suggest that there was a significant relationship between frequency of use of progressive muscle relaxation and stress reduction, but failed to establish a significant relationship between use and stress reduction with the guided imagery group. The second hypothesis that there would be a relationship between frequency of use of a relaxation technique and stress reduction was supported for the progressive muscle relaxation technique and stress reduction group.

The researcher expected that there would be a relationship between frequency of use of either treatment
and stress reduction. It was not anticipated that the relationship would be significant for one treatment group and not for the other. The subject numbers of the two treatment groups is relatively small (progressive muscle relaxation, n=17; guided imagery, n=20). The larger a study group, the less effect a few subject deviations will make on the correlation of the relationship between the variables of study. A repeat study using larger subject populations for each group might yield more significant results from which to draw implications.

Limitations

The limitations of this study include:

1. The generalizability of the study's findings are limited to the sample of nurses taken from the study hospital.

2. The use of volunteers for the study may be a limitation. It is possible that those subjects who volunteered were more stressed and feeling a higher degree of discomfort related to stress than the general population of nurses.

3. The small subject numbers for each group is a limitation of the study. Although not significant statistically, there was an interaction between the treatment groups. A larger number in each group may have allowed for a more powerful statistic analysis.
Implications

The implications suggested from this study include the following:

1. The use of a relaxation technique is effective in reducing the physical, behavioral, and cognitive symptoms of stress.

2. Neither guided imagery nor progressive muscle relaxation is more effective as a technique in reducing stress.

3. The specific guided imagery script written for use with the study is effective in reducing stress.

Recommendations

The following recommendations, based on the findings of this study, are suggested:

1. A repeat study using a larger sample size is needed. This may allow for detecting a significant difference between the effectiveness of treatment groups.

2. Given a sufficiently large sample size, it would be of interest to examine the effect of a specific treatment on one of the subscales (physical, behavioral, cognitive). This would allow the researcher to analyze if one relaxation technique would be more effective than another on a specific set of symptoms.

3. Exploration of treatment effect on other variables, such as the immune system, perceived control, depression, and anxiety may validate the use of relaxation techniques in other areas of health promotion.
4. The effectiveness of the Strain Questionnaire should be tested against other tools utilized in the measures of stress.

Summary

In essence, the literature indicates that health professionals from all disciplines are beginning to utilize relaxation and imagery to help their patients and clients more effectively help themselves. Throughout the sciences and humanities, a resurgent holistic view of man and life is emerging. In medicine and psychology, the separation of mind and body is beginning to merge into an interconnected concept of oneness.
References


APPENDIX A

Introductory Letter
Dear Colleague:

Please permit me to introduce myself. I am a Graduate Student in Nursing at the Medical College of Georgia. I am writing to you because I would like your assistance in my research for the masters thesis. Having worked with nursing stress for the past nine months at University Hospital, I have come to understand how important techniques of stress management can be in reducing the negative effects of stress. My research thesis is entitled, "A Comparison of the Effects of Progressive Muscle Relaxation and A Specific Guided Imagery on Stress Reduction". The population for my study will be any R.N. or L.P.N. currently employed at University Hospital. I would, therefore, like to invite you to volunteer to participate in my study and to let you know how much I would appreciate your participation. First, let me tell you more about the study.

WHAT IS INVOLVED IF I DECIDE TO PARTICIPATE?

Should you volunteer to participate you would be asked to do the following things over a two week period:

1. Fill out an initial demographic data questionnaire and stress evaluation questionnaire.
2. Attend a 45 minute introductory session where you would be taught a specific relaxation technique, depending on which group you are randomly assigned. (Should you not be chosen for participation during the random selection process, arrangements will be made to provide training sessions to all volunteers after the two week study is complete.) After the completion of the first training session, you will be given a tape of a specific relaxation technique for continued home use.
3. Listen to the tape you receive once per day and to document the number of times you actually use the tape on a flow sheet to be provided.
4. Meet for a brief final session to fill out a stress assessment questionnaire which takes from 10-15 minutes to fill out, at the conclusion of the two weeks.
WHAT SPECIFIC RELAXATION TECHNIQUES WILL BE TAUGHT?

Volunteers will be randomly assigned to either a progressive muscle relaxation group or a guided imagery relaxation group. Progressive muscle relaxation is a technique that teaches the participant to relax the muscles of the body; guided imagery is a relaxation technique that involves using the imagination to think of a relaxed setting in order to elicit relaxation.

WHAT WILL I GAIN FROM THIS EXPERIENCE SHOULD I CHOOSE TO VOLUNTEER?

You will benefit from this study in several ways. You will learn a technique that is commonly suggested for the reduction of stress and also thought to promote health and general well-being. You will also receive a copy of a tape at the end of the study which has a copy of both relaxation techniques, one on each side, for your future use.

HOW WILL YOU PROTECT MY RIGHT TO PRIVACY IN RELATION TO THE QUESTIONNAIRES YOU WILL BE ASKING ME TO FILL OUT?

All responses will be strictly anonymous. Volunteers will be asked to select a code number of their own choosing which will be known only to them and not to the investigator. This code number will be used in lieu of the person's name on all collected material.

WHAT IF I DON'T LIKE THE TECHNIQUE ONCE I LEARN IT OR EVEN AFTER I START USING IT?

You will be free to withdraw from the study at any time that you decide to withdraw your participation.

WHAT WILL BE DONE WITH THE RESULTS?

The results will be statistically analyzed. As the secret personal code will be used by the participant, no one will be identifiable by name in the analysis of the data. The results will then be written into the thesis.

SO, HOW DO I VOLUNTEER?

It is easy. Sign the attached form and place it in the envelope provided on your particular unit that is labeled, Relaxation Study. You will then receive your group assignment, a consent form to sign, the initial demographic data questionnaire, and a schedule for the introductory session. Should you have any questions, please feel free to call the investigator, Sharon Ann Cumble at MCG - 721-4602 and leave a message. I shall greatly appreciate your participation in this study. It should be fun to do and of benefit to each of you.
YES. I WOULD LIKE TO VOLUNTEER TO PARTICIPATE IN YOUR STUDY AND TO LEARN MORE ABOUT THE USE OF RELAXATION TECHNIQUES FOR DECREASING THE EFFECTS OF STRESS.

NAME ______________________________________________________

UNIT ___________________________ RN ________ LPN ________

USUAL SHIFT OR ROTATION __________________________________

YOU MAY CONTACT ME AT (PHONE) _____________________________

*PLEASE PLACE THIS FORM IN THE ENVELOPE IN YOUR WORK AREA LABELED "RELAXATION STUDY".

THANK YOU FOR VOLUNTEERING TO PARTICIPATE!!!
APPENDIX B

Consent Form
INFORMED CONSENT FOR
A Comparison of the Effects of
Progressive Muscle Relaxation and a
Specific Guided Imagery on Stress Reduction

Principal Investigator: Sharon Ann Cumbie, R.N., B.S.N.
M.S.N. Candidate, Medical College of Georgia

INVITATION TO PARTICIPATE

I have been invited to participate in a study which will compare the effects of a specific relaxation technique, either progressive muscle relaxation or guided imagery. I have been asked to participate because I am an R.N. or L.P.N. employed at University Hospital and do not have a history of severe depression, psychosis, or cardiac irregularities--conditions which might place me at risk.

I shall participate in a group of not more than 20 people in an initial introductory session, and then three training sessions to occur over the course of three weeks. I shall return for one final time for a 20 minute session in which to fill out a questionnaire. To protect my anonymity and, at the same time, to permit a correlation of various data, I shall select and use a code number known only to me. All data will remain anonymous. With the anonymity of my information assured, I do hereby certify I do not have a history of severe depression, psychosis, or cardiac irregularities, and no present or future physical, psychological, social, economic, legal or other risks are anticipated.

The following general principles apply to all participants in this study:

1. I will participate of my own free will;

2. while I may not benefit personally from participation in the study, knowledge may be gained that will benefit others;

3. I may withdraw from the study at any time simply by notifying the investigator.

DESCRIPTION OF STUDY PROTOCOL

I will be randomly assigned to either a progressive muscle relaxation group, a guided imagery group, or waiting-list control group. If assigned to the waiting-list control group, I will receive the training and audio tape in two weeks, after completing the stress questionnaire.
I will participate in a group of not more than 20 people in an initial 45 minute introductory session. In two weeks, I will return for a 10 minute session in which I will fill out a questionnaire. To protect my anonymity and, at the same time, to permit a correlation of various data, I shall select and use a code number known only to me. All data will remain anonymous.

I understand that in the two week period I will be requested to do the following:

1. Fill out initial demographic data and stress evaluation questionnaire.
2. Attend a 45 minute introductory session.
3. Listen to the tape given me during the first session once per day.
4. Document on provided flow sheet the actual number of times I do listen to the tape during the two week period.
5. After two weeks, meet for a brief final session to fill out the stress questionnaire.

POTENTIAL BENEFITS

The benefits of relaxation techniques for the reduction of stress and promotion of health are well documented in the literature. You will learn a technique of relaxation that may enhance your daily process of coping with stress.

POTENTIAL RISKS

The use of imagery is not recommended for people who are pre-psychotic or psychotic, who suffer from organic brain syndrome, or who have difficulty in concentrating. Caution is advised with the use of guided imagery in persons who have a history of severe depression, psychosis, or cardiac irregularities.

BALANCE OF RISKS AND BENEFITS

Though a few researchers address the risks that have been listed, these risks are generally thought of as being minimal. The predominance of the literature supports the use of relaxation techniques for the reduction of stress and the promotion of health.

CONDITIONS OF PARTICIPATION

I will neither be paid nor charged anything for participating in this project. Direct benefits which I expect to
receive are learning a technique which I may use to assist me personally; learning a technique of stress reduction; and receiving from the investigator, after the conclusion of my participation in the two week study, a copy of an audio cassette tape with the progressive muscle relaxation script on one side and the guided imagery script on the other.

I have been assured that confidentiality will be preserved and that my name will not be revealed in any reports or publications resulting from this study.

I understand that University Hospital assumes no obligation to pay any money or provide free medical care in case this project results in any harm to me. If I decide not to continue with this study, I may revoke my consent and withdraw at any time without penalty or loss of care or other benefits to which I am otherwise entitled.

With the anonymity of my information assured, I do hereby certify I do not have a history of severe depression, psychosis, or cardiac irregularities, and no present or future physical, psychological, social, economic, legal or other risks are anticipated.

I have read this document and it has been explained to me. I have had an opportunity to ask questions and they have been answered to my satisfaction. If I have further questions, I may call Sharon Ann Cumbie at (404) 737-2731 or (404) 737-1725. If I have questions concerning the rights of research subjects, I can contact Victor A. Moore, M.D., at (404) 722-9011, ext. 2408.

With this understanding, I hereby consent to participate in this study.

_________________________________________  __________________________
Subject's Signature                        Date

_________________________________________  __________________________
Witness's Signature                        Date

_________________________________________  __________________________
Principle Investigator's Signature         Date
APPENDIX C

Demographic Data
Demographic Data

Please provide the following general information about yourself (write in or check).

1. What is your age? ______________

2. Your sex?
   _____ Male
   _____ Female

3. Your racial/ethnic group?
   _____ White
   _____ Black
   _____ Asian
   _____ Hispanic
   _____ Other

4. Your marital status?
   _____ Never Married
   _____ Married
   _____ Divorced/Separated
   _____ Widowed

5. What is the highest educational degree that you have obtained?
   _____ Vocational (LPN)
   _____ Associate Degree
   _____ Baccalaureate
   _____ Masters
   _____ Doctorate
APPENDIX D

Progressive Muscle Relaxation Script
PROGRESSIVE MUSCLE RELAXATION SCRIPT

Assume a comfortable position.....legs and feet uncrossed.....place your hands on your lap.....or at your sides.....whatever is most comfortable for you.....close your eyes.....and notice that as you do.....things begin to change immediately.....as you close your eyes.....your body begins to quiet.....to relax.....to let go.....of tension and stress.....

Now begin to focus on your breathing.....breathe in.....feeling yourself becoming more centered.....breathe out.....letting go of tension and stress.....centering your attention on the process of your body beginning to relax........breathe in.........feeling relaxed........breathe out.....letting go of tension........concentrating on the feeling of warmth and comfort that comes with relaxation....

As you continue to be aware of your breathing.....breathing deep....and slowly....experiencing increasing relaxation.....you will be guided through a process of progressive muscle relaxation.......you will be asked to tighten.......then relax......specific muscle groups.....concentrating your awareness on the difference between the feeling of tension and.....relaxation.......you will begin to be aware of the warmth and comfort you feel when letting go of the tension you are holding in your muscles.....

With your eyes still closed.....starting with your feet and legs.....tighten the muscles of lower leg by flexing your feet.....bringing your toes up toward your knees.....feeling the tension in your calves.....hold that tension.....take in a deep breath.....and as you let it out.....gradually let go of the tension you are holding in your legs and feet.....letting go.....returning to a relaxed position.....concentrating your awareness on the warmth and comfort that comes with relaxation.....

Next.....tighten the muscles of your thighs.....holding them tight.....tighter.....take in a deep breath.....hold it.....feeling the tension.....and now breathe out.....and as you do.....let go of all the tension you are holding in your legs.....letting go.....concentrating your awareness of the spread of warmth.....going up your legs.....past your knees.....a comfort.....as you begin to relax.....to let go of the tension you are holding in your muscles.....

Next.....tighten the muscles in your buttocks.....tight.....tighter.....take in a deep breath.....and as you let it out.....letting go of the tension you are holding in your buttocks.....letting go.....relaxing these muscles.....aware of the spread of warmth and comfort that comes with relaxation.....
Now...tightly the muscles in your stomach...holding them tight like you would if you were about to experience a blow to the stomach...tighter...take in a deep breath...hold it...and as you let it out...let go of all the tension you are holding in your stomach...letting go...relaxing your stomach...concentrating on the spread of warmth up your legs...into your body...as you begin to relax...to let go...of the tension you are holding in your muscles...relaxing...letting go...

Next...make a fist with your hands...as tight as you can...concentrate on that tightness...what the tension feels like...take in a breath...and as you let it out...let go of the tension you are holding in your hands...opening your hands...relaxing...letting go...and concentrating your awareness on the feeling of warmth and comfort that comes as you relax...letting go...of all the tension in your muscles...relaxing...

Now...tense your upper arm by bringing the palms of your hands together...in front of your chest...pressing your palms together...tighter...tighter...feeling the tension in your upper arms...take in a breath...and as you let it out...let go of the tension you are holding...relaxing your arms...returning your arms to a comfortable position...concentrating now on the flow of warmth...spreading up your arms...past your elbows...on up toward your shoulders...concentrating on the warmth and comfort that comes with relaxation...

Next...bring your shoulders up...toward your ears...holding your shoulders tight...tighter...take in a breath...and now as you let it go...let go of the tension you are holding...allowing your shoulders to relax...returning to a comfortable...more relaxed position...concentrating only on the flow of warmth and comfort as your whole body...all of your muscles...begin to relax...letting go of tension...letting go of stress...feeling relaxed...

Now...gently lean your head back so that you stretch the muscles in your neck...feel the tension in these muscles...take in a breath...and as you begin to let it out...slowly bring your head back to a comfortable position...feeling all the tension in your neck letting go...relaxing...concentrating on the warmth that comes with relaxation...Next...drop your head down toward your sternum...your chest...feel the tension...the tightness...take in a breath...and as you let it out...return your head back to a comfortable position...letting go of all the tension in your neck...feeling the warmth and flow of comfort spreading throughout your body...as you continue to relax...
And last....make a funny face.....like you have taken a bite into a very sour lemon.....hold your face tight.....tighter.....and now take in a deep breath and as you let it out.....let go of the tension you are holding in the muscles of your face.....relaxing your face.....concentrating now on the flow of warmth and comfort that you feel in your body...flowing from your feet.....up through your body on up.....to your head.....your face.....down your arms.....comfort.....relaxation.....warmth.....

Now take a deep cleansing breath.....hold it.....and as you let it out.....cleanse yourself of all remaining tension....feeling completely relaxed.....all of your body relaxed.....free of tension.....free of stress.....concentrate on the feeling of comfort.....the warmth.....on the contrast between tension and relaxation.....

Gradually return your consciousness to the here and now.....aware of your surroundings.....and open your eyes when you are ready.....feeling relaxed and calm.....free of tension and stress.....relaxed.....yet full of a renewed energy and centeredness.
APPENDIX E

Guided Imagery Script
GUIDED IMAGERY SCRIPT

The following script was written and developed by Sharon Ann Cumbie, Graduate Student at the Medical College of Georgia, based on a review of the literature pertaining to the interactional model of stress and cognitive coping strategies.

Assume a comfortable position....legs and arms uncrossed.... place your hands on your lap....or at your sides....whatever is most comfortable for you....close your eyes....take in a breath....and as you let it out....notice that things already begin to change....you begin to feel more relaxed....more comfortable....calm....peaceful..........

Now begin to focus on your breathing....breathe in.......... and feel yourself becoming more centered....breathe out..... letting go of tension....stress....letting go....feeling more....and more relaxed....breathe in....experiencing your center....that part of you that gives you strength............ breathe out....letting go of all remaining tension....feeling the spread of warmth and comfort....that comes with relaxation..................

And as you continue to be aware of your breathing....breath­ing deep....and slowly....experiencing increasing relaxation....allow your mind to concentrate on any areas of tightness....of tension in your body....imagine a warmth....like that of the sun....reaching those places....giving you comfort.....warmth.....relaxation.....letting go of all the tension that remains in your body....notice....that as you begin to let go of the tension....that your body relaxes more.......and more.....letting go.....relaxing....feeling the spread of warmth and comfort........that comes with relaxation........

Now as you begin to feel more relaxed you may find thoughts entering into your consciousness....this is normal....as these thoughts enter....gently let go of the thought....concentrating on the rhythm of your breathing....letting go of sounds you may hear around you....only aware of the process of your body becoming more and more relaxed....take in a deep breath and....as you let it out....cleanse yourself of all remaining tension....stress....feeling completely relaxed........

Now....imagine that you are standing at the top of a small escalator that is moving slowly down....into a large lighted room....and as I count from five to one........imagine yourself.....stepping onto the escalator....five....you step on the escalator....holding on to the side rails....it is moving slowly....you feel safe and secure....four....you continue moving down....down....toward the light of this large room....three....you feel safe....and warm....and secure....two....you continue moving slowly....almost there....and one....you step off into the room....it is
bright with a pleasant light...and as you walk through this room...give it a color

Now...at the other end of this room is a door...and as you walk toward that door...imagine that...behind that door lies a problem...a problem that causes you difficulty...places demands on you...now we are going to walk through that door...and as you do...give your problem a size...it may be so large that you can hardly squeeze into the room...or it may be much smaller...as you face your problem...those daily hassles...or something more specific...give your problem a shape...a color

And now as you again focus on your breathing...notice that as you breathe in...you feel stronger...and stronger...and as you breathe out...notice how your problem becomes smaller...and...smaller...That's right...breathe in...feeling yourself getting stronger...more capable...breathing out...noticing your problem getting smaller...and smaller...until it is so small...you can hold it in the palm of your hand...and taking it in your hand...notice that it has changed shape...and form...and it is now your favorite color

Now there is a window in this room and imagine yourself going to the window...and holding up the problem...to the light coming in...that it is clear...and you can see through it...and it is not so large...and it reflects the light like a beautiful crystal...illuminating the whole room your favorite color...and now...notice that there is another door in this room and imagine yourself...walking through that door...and walking to the most beautiful...peaceful place that you can imagine...a place...that belongs only to you...a special place...and look around...what do you see...smell the air...what fragrances do you smell...is the sky cloudy or clear...notice any trees...or flowers...see all the colors...are there any sounds...what do you hear...are there any living creatures nearby...see it...touch it...using all your senses...experience your special place...knowing that you may return to your place...at any time...merely by closing your eyes...taking in a deep breath...and visualizing your special place...you can return...just by closing your eyes...taking in a deep breath and feeling calm...peace...and relaxation you feel right now...and now before we return to the here and now...take a deep breath...hold it...now let it out...feeling strong and capable...alive...happy...and as I count from one to five you will return to the here and now...one...becoming aware of the sounds around you...two...feeling strength in your arms and legs...three...four...feeling alert...with renewed energy...five...open your eyes when you are ready...feeling great...
APPENDIX F

Flow Sheet for Relaxation Technique
FLOW SHEET FOR RELAXATION TECHNIQUE

Enter a check mark for each time you listen to the tape on each day of the study. (You may also make any comments you wish.) Thank you!!

DATE

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APPENDIX G

Strain Questionnaire
Please read the following list and circle the letter that most closely corresponds to how often in the past week you have experienced or felt each of the items listed.

<table>
<thead>
<tr>
<th>Item</th>
<th>A = Not at all</th>
<th>B = 1 or 2 days</th>
<th>C = 3 or 4 days</th>
<th>D = 5 or 6 days</th>
<th>E = Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. backaches</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. muscle soreness</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. numbness or tingling in body</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. heaviness in arms or legs</td>
<td>A   B   C   D   E</td>
<td></td>
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<td></td>
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<tr>
<td>5. weakness in body parts</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. tense muscles</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. pain in neck</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. nausea or upset stomach</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. diarrhea or indigestion</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. tight stomach</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. loss of or excessive appetite</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>12. pain in heart or chest</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. shortness of breath</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. faintness, dizziness</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. racing heart</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. light headedness</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. headaches</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. hot or cold spells</td>
<td>A   B   C   D   E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. lump in throat</td>
<td>A   B   C   D   E</td>
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<td>20. dryness of throat and mouth</td>
<td>A   B   C   D   E</td>
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<td>21. teeth grinding</td>
<td>A   B   C   D   E</td>
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<td>22. trembling or nervous tics</td>
<td>A   B   C   D   E</td>
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<td>23. sweating</td>
<td>A   B   C   D   E</td>
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<td>24. sweaty hands</td>
<td>A   B   C   D   E</td>
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<td>25. itching</td>
<td>A   B   C   D   E</td>
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<td>26. cold or warm hands</td>
<td>A   B   C   D   E</td>
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<td>27. frequent need to urinate</td>
<td>A   B   C   D   E</td>
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<td>28. pre-menstrual tension or missed cycles</td>
<td>A   B   C   D   E</td>
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<td>29. spent more time alone</td>
<td>A   B   C   D   E</td>
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<td>30. irritability</td>
<td>A   B   C   D   E</td>
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<td>31. impulsive behavior</td>
<td>A   B   C   D   E</td>
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<td>32. easily startled</td>
<td>A   B   C   D   E</td>
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<td>33. stuttering/other speech</td>
<td>A   B   C   D   E</td>
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<td>34. insomnia</td>
<td>A   B   C   D   E</td>
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<td>35. inability to sit still</td>
<td>A   B   C   D   E</td>
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<td>36. smoking</td>
<td>A   B   C   D   E</td>
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<td>37. use of recreational drugs</td>
<td>A   B   C   D   E</td>
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<td>38. use of prescription drugs</td>
<td>A   B   C   D   E</td>
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<td>39. use of alcohol</td>
<td>A   B   C   D   E</td>
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<td>40. accident proneness</td>
<td>A   B   C   D   E</td>
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<td>41. believe the world is</td>
<td>A   B   C   D   E</td>
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<td>42. feeling out of control</td>
<td>A   B   C   D   E</td>
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<td>43. urge to cry or run</td>
<td>A   B   C   D   E</td>
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<td>44. feeling of unreality</td>
<td>A   B   C   D   E</td>
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<td>45. feeling that you are no good</td>
<td>A   B   C   D   E</td>
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<td>46. inability to concentrate</td>
<td>A   B   C   D   E</td>
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<td>47. nightmares</td>
<td>A   B   C   D   E</td>
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<td>48. think things can't get any worse</td>
<td>A   B   C   D   E</td>
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Letter from author of Strain Questionnaire here
APPENDIX H

Research Approval

Human Assurance Committee

Medical College of Georgia
June 29, 1988

Sharon Ann Cumbie, R.N., B.S.N.
School of Graduate Studies
Department of Psychiatric/
Mental Health Nursing
Medical College of Georgia
Campus

RE: PROJECT TITLE - A COMPARISON OF THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION AND A SPECIFIC GUIDED IMAGERY ON STRESS REDUCTION

FILE NO. 88-6-249
EXPEDITED APPROVAL - JUNE 29, 1988

Dear Ms. Cumbie:

The Human Assurance Committee has reviewed and approved the above referenced project by expedited procedure in accordance with the DHHS policy and the institutional assurance on file with the DHHS.

Sincerely,

[Redacted]

George S. Schuster, D.D.S., PHD.
Chairman
HUMAN ASSURANCE COMMITTEE
APPENDIX I

Institutional Review Board

University Hospital Nursing Service
April 28, 1988

Human Assurance Committee
Medical College of Georgia
Augusta, Georgia 30912

Dear Sir/Madam:

This letter is a document to support Sharon Cumbie's request to work with nursing personnel at University Hospital if the Institutional Review Board of University Hospital approves her research request.

I appreciate Sharon's enthusiasm and look forward to her continued contributions to nursing.

Sincerely,

Marilyn Bowcutt, R.N., M.S.N.
Assistant Administrator
Division of Nursing Services

MB:jp
November 1, 1988

Victor A. Moore, M.D.
Chairman
Institutional Review Board
University Hospital
Augusta, Georgia 30912

Dear Dr. Moore:

Thank you for reviewing my proposal and assisting me in its preparation through your comments and suggestions. I would like to request an expedited review of my research proposal, "A Comparison of the Effect of Progressive Muscle Relaxation and a Specific Guided Imagery on Stress Reduction." This study poses minimal risk to the participant and may, therefore, qualify for an expedited review.

I appreciate your suggestion to have the control group listen to a tape of comparable length which is not designed primarily for stress reduction. The difficulty with implementing this into the study design is that the very process of just sitting quietly for 15 minutes twice a day may reduce stress.

In the future, I would like to compare specific stress reduction techniques with nonspecific activities such as listening to music or an environmental tape or just sitting quietly. It may be that a regular period of quiet time for personal reflection would be beneficial for stress reduction. For the purpose of this comparative study, I do not want the control group to receive any regular treatment which may affect their stress levels.

I look forward to performing my research study at University Hospital. Thank you, again, for your input.

Sincerely,

Sharon Ann Cumbie, R.N., B.S.N.
M.S.N. Candidate
Medical College of Georgia
Augusta, Georgia

SAC/ctp
November 7, 1988

Sharon Ann Cumbie, R.N., B.S.N.

Re: Project Title - A Comparison of the Effects of Progressive Muscle Relaxation and a Specific Guided Imagery on Stress Reduction

Dear Ms. Cumbie:

I have reviewed your above-referenced project in light of your request to submit this project for expedited review due to the time constraints of data collection. I have noted that this project involves minimal subject risk, is entirely voluntary and assures confidentiality, and also that you have obtained the necessary administrative approval. Therefore, in my capacity as Chairman of the University Hospital Institutional Review Board, and in accord with DHHS regulations and the assurances on file with the DHHS, I grant this project full approval through the mechanism of expedited review. This information will be presented to the full IRB at its monthly meeting of November 17, 1988.

Monitoring the project and reporting project progress to the study sponsor and this IRB are the two major responsibilities that you have as an investigator. This project must be resubmitted annually for IRB continuing review. A continuation application will be sent to you one month prior to the approval expiration date. This application will indicate reapproval criteria and resubmission deadlines.

Sincerely,

Victor A. Moore, M.D.
Chairman
University Hospital Institutional Review Board

VAM:ch