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A PILOT STUDY

USING IMAGERY AS A MEANS OF IMPROVING WEANING PARAMETERS IN COPD PATIENTS

by

Beth Y. Kohsin

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

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May 1994

A PILOT STUDY

USING IMAGERY AS A MEANS OF IMPROVING

WEANING PARAMETERS IN COPD PATIENTS

by

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ABSTRACT

Weaning mechanically ventilated chronic obstructive pulmonary disease (COPD) patients is a difficult process due to the patient's limited functional capacity resulting from the preexisting disease, but weaning is made even more difficult by the physiologic and psychologic stresses of the weaning process itself. The purpose of this pilot study was to investigate imagery as a means of improving weaning parameters in mechanically ventilated COPD patients through reduction of stress. Weaning parameters measured (which were also indicators of stress) were heart rate, respiratory rate, mean arterial blood pressure, ratio of respiratory frequency to tidal volume, and oxygen saturation.

The study was experimental in design, with a convenience sample of six mechanically ventilated COPD patients randomly assigned to either an experimental group receiving audiotaped imagery, or a control group receiving audiotaped pink noise. The parameters were taken at 30-minute intervals, twice prior to listening to the 15-minute audiotapes and twice after listening to the tape.

Effectiveness of the audiotaped imagery was measured according to mean changes in the parameters of the experimental group as compared to mean changes in the control group. Findings of the study indicated audiotaped imagery had no statistically significant effect on the heart rate, respiratory rate, mean arterial blood pressure, ratio of respiratory frequency to tidal volume, and oxygen saturation in the ventilated COPD patient. However, comparison of mean changes of oxygen saturation between groups indicated a greater change in the audiotaped imagery group than in the audiotaped pink noise group that was statistically significant.

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CHAPTER 1

Introduction and Theoretical Concepts

Introduction

With the current state of escalating health care costs, attention and energy are focused on ways of cost reduction. One area of concern is chronic obstructive pulmonary disease (COPD) because of its significant impact on human and economic resources (Rotman, 1991). Acute respiratory failure in COPD often requires mechanical ventilation, and once ventilation is initiated it is difficult to discontinue. These difficult-to-wean patients frequently remain on mechanical ventilation for extended periods of time, adding to the overwhelming costs of health care (Cohen et al., 1991; Knebel, 1991; Lush, Janson-Bjerklie, Carrieri, & Lovejoy, 1988). This extended period of mechanical ventilation also serves to intensify the psychological ramifications for the patient; for example, fear of weaning failure, feelings of hopelessness, and depression (Henneman, 1991). The challenge for nursing when caring for these patients is to determine effective methods that facilitate the weaning process and decrease weaning time, thereby reducing health care costs.

Weaning patients from mechanical ventilation is often a difficult and tedious process (Bridges, 1992; Cohen et al., 1991; Henneman, 1991), and takes longer in patients with COPD (Acosta, 1988; Conti et al., 1992; Henneman, 1991; Knebel, 1991). A major determinant of weaning success is the patient's adaptation to the physiological demands of weaning (Fitzgerald & Huber, 1976; Henneman, 1991; Tobin & Dantzker, 1991), and from a psychophysiological perspective, the effects of psychological factors greatly compound these demands. Acosta (1988), Grossbach-Landis (1980), Henneman (1989), and Knebel (1991) have proposed that interventions which assist the patient in lessening or alleviating these psychological stressors during the weaning process decrease physiological demands placed on the patient, thereby promoting adaptation to independent respirations.

Promoting patients' adaptation to weaning is a challenge for nurses. Adopting a psychophysiological approach by helping patients perceive stressors as nonthreatening or less threatening helps to prevent, alleviate or reduce physiological manifestations of stress. Various techniques have been examined as to their effects on psychological stress reduction in ventilator-dependent patients. Acosta (1988) found biofeedback combined with progressive relaxation aided in decreasing a patient's apprehension during weaning trials. Biofeedback has also been effective when used in conjunction with hypnosis to successfully wean a previously difficult-to-wean neurologic patient (LaRiccia, Katz, Peters, Atkinson, & Weiss, 1985). Henneman (1989) experimented with verbal interaction and holding the patient's hand as means of decreasing the stress response during weaning, although with no significant findings. No research was found regarding the effect of imagery on weaning.

Statement of the Problem

COPD is an irreversible destructive process of lung tissue and obstruction within the airways resulting in decreased capability of the lungs to perform their function of gas exchange (Dettenmeier, 1992; Rotman, 1991). Because of this limited functional capacity, COPD patients are predisposed to difficulties during weaning from mechanical ventilation (Conti et al., 1992; Henneman, 1991; Knebel, 1991; Lush, Janson-Bjerklie, Carrieri, & Lovejoy, 1988; Tobin & Dantzker, 1991). Both physiological and psychological factors contribute to successful or unsuccessful weaning.

Several physiological factors affect the outcome of weaning. Those attributed to the disease itself include decreased lung compliance, increased airway resistance, and hypoxemia due to decreased perfusion capabilities in lung tissue (Tobin & Dantzker, 1991). In addition, possible respiratory muscle atrophy due to prolonged mechanical ventilation can also cause difficulties (Shikora et al., 1990; Tobin & Dantzker, 1991). All of these factors necessitate increased work of breathing in order for the patient to compensate. In addition, the patient is asked to adapt from assisted ventilation to independent respiration, a physiologically complicated task even in the absence of disease (Bridges, 1992; Henneman, 1991; Tobin & Dantzker, 1991).

The shift from assisted ventilation to independent respirations is not only physiologically challenging for the COPD patient, but is also a source of psychological stress (Acosta, 1988; Grossbach-Landis, 1980; Henneman, 1989). In order to understand the impact of psychological stress on weaning in these patients, it is necessary to realize psychological stress is inherent in the disease itself (Grossbach-Landis, 1980; Perry, 1974). As COPD progresses patients must cope with and adapt to progressive breathlessness, and depending on the severity of breathlessness, the patient may experience stress or may become anxious. Research findings indicate a positive correlation between level of anxiety and feelings of dyspnea (Gift & Cahill, 1990; Gift, Moore, & Soeken, 1992; Gift, Plaut, & Jacox, 1986). This relationship is cyclical in that as the patient feels increasingly dyspneic the level of anxiety rises, which in turn, causes increased dyspnea (Grossbach-Landis, 1980).

Adding the prospect of weaning to the already stressful state of COPD can significantly increase the patient's anxiety level. The patient's perception of weaning as threatening to their existence may stem from past experiences with episodes of severe dyspnea, past experiences with weaning, fear of not being able to breathe without the ventilator, and the ultimate fear of death (Knebel, 1991; Linn, 1979). To COPD patients weaning means taking away their only means of survival, their life-support (Linn, 1979).

Several techniques of psychophysiologic relaxation, or methods that assist patients in altering their perception of an event or stressor, have been shown effective in mediating the stress response in many circumstances (Acosta, 1988; Benson, 1979; Gift, Moore, & Soeken, 1992; Stephens, 1992; White, 1992; Wynd, 1992b). Included in these techniques is imagery, which researchers found moderated physiologic manifestations of stress, such as heart rate, respiratory rate, and arterial blood pressure (Heath, 1992; King, 1988). Imagery is an internal representation of events involving the senses that forms a link between mind and body (Achterberg & Lawlis, 1982). This link enables a person to mentally and consciously modify physiologic functions, such as heart rate, respiratory rate, blood pressure, and muscle tension. Although evidence of this imagery link has been examined in many situations, no research has been found regarding the effects of imagery on patients being weaned from mechanical ventilation.

Purpose of the Study

The purpose of this study was to investigate imagery as a means of improving weaning parameters in mechanically ventilated COPD patients through reduction of stress. Physiologic manifestations of stress include increases in heart rate, respiratory rate, blood pressure, and muscle tension. In the COPD patient these factors are frequently used as weaning parameters since traditional parameters are not applicable because of the preexisting disease state (Nett, Morganroth, & Petty, 1987; Sahn, Lakshminarayan, & Petty, 1976; Yang & Tobin, 1991). Because of these baseline physical limitations, the COPD patient must be evaluated clinically. Therefore, for the purposes of this study, the effects of imagery were measured in terms of the following weaning parameters: heart rate (HR), respiratory rate (RR), mean arterial blood pressure (MAP), the ratio of respiratory frequency to tidal volume (f/V_t), and oxygen saturation (SaO_2).

Research Questions

1. What effect does audiotaped imagery have on heart rate in ventilated COPD patients?

2. What effect does audiotaped imagery have on respiratory rate in ventilated COPD patients?

3. What effect does audiotaped imagery have on mean arterial blood pressure in ventilated COPD patients?

4. What effect does audiotaped imagery have on the ratio of respiratory frequency to tidal volume in ventilated COPD patients?

5. What effect does audiotaped imagery have on oxygen saturation in ventilated COPD patients?

6. Does the gender of the ventilated COPD patient affect the response to audiotaped imagery?

7. Does the age of the ventilated COPD patient affect the response to audiotaped imagery?

Statement of the Hypotheses

1. Heart rate in the ventilated COPD patient will decrease after audiotaped imagery.

2. Respiratory rate in the ventilated COPD patient will decrease after audiotaped imagery.

3. Mean arterial blood pressure in the ventilated COPD patient will decrease after audiotaped imagery.

4. The ratio of respiratory frequency to tidal volume in ventilated COPD patients will decrease after audiotaped imagery.

5. Oxygen saturation in the ventilated COPD patient will increase after audiotaped imagery.

6. The gender of ventilated COPD patients will not affect the response to audiotaped imagery.

7. As the age of ventilated COPD patients increases, the response to audiotaped imagery will decrease.

Theoretical and Operational Definition of Terms

COPD patients were theoretically defined as those patients with an irreversible destructive process of lung tissue and obstruction within the airways resulting in decreased capability of the lungs to perform their function of gas exchange (Dettenmeier, 1992; Rotman, 1991). COPD patients were operationally defined in this study as those patients with a primary diagnosis of COPD with acute respiratory failure and who were currently on mechanical ventilation.

Mechanical ventilation was theoretically defined as artificial assistance of pulmonary ventilation via endotrachial tube placement and connection to a mechanical ventilator (Tobin & Dantzker, 1991). Mechanical ventilation was operationally defined in this study as ventilatory assistance via endotracheal tube placement and connection to a Bennett 7200 mechanical ventilator.

Weaning was theoretically defined as discontinuation of mechanical ventilation during a transitional period from ventilatory assistance to spontaneous or independent respirations (Henneman, 1991; Tobin & Dantzker, 1991). Weaning was operationally defined in this study as transition from mechanical ventilation to independent respirations with a progression from intermittent mechanical ventilation (IMV) to continuous positive airway pressure (CPAP) to independent respirations.

Imagery was theoretically defined as a technique whereby "mental images, or internal representations of events involving the senses, form a bridge between mind and body [and spirit], and provide a method for mentally and consciously altering body function" (Achterburg & Lawlis, 1982, p. 56). Imagery was operationally defined in this study as the use of an imagery audiotape using a meadow scene (see Appendix A). The audiotaped imagery session was 15 minutes in length and was administered with the use of a cassette tape player and headphones.

Assumptions

1. Weaning from mechanical ventilation places physiological demands on the patient.

2. Mechanical ventilation is perceived as stressful by the COPD patient and by eliciting the stress response compounds physiologic demands on the patient.

Summary

This chapter discussed COPD and its impact on human and economic resources. A major factor contributing to this impact is the fact that many COPD patients experience acute respiratory failure resulting in mechanical ventilation. Once placed on the ventilator, these patients have a difficult time weaning due to the physiological limitations caused by the preexisting disease state and the psychological impact of the weaning process itself. Altering patients' perception of weaning reduces or alleviates the stress response, which results in decreased pnysiologic demands placed on the patient and effective adaptation from dependent ventilation to independent respirations. The purpose of this study was to investigate imagery as a method for reducing stress, thereby improving weaning parameters.

CHAPTER 2

Review of Literature

Introduction

Literature and research relevant to the use of audiotaped imagery in weaning chronic obstructive pulmonary disease (COPD) patients are reviewed in this chapter. The review begins with a discussion of psychophysiology as related to stress and relaxation responses. This is followed by research regarding mechanically ventilated patients and their responses to various relaxation techniques during the weaning process. Next, imagery is discussed as a means of mediating the stress response, as indicated in previous research. The chapter concludes with a discussion of the Neuman Systems Model as the theoretical framework for the study.

The Psychophysiologic Perspective

Psychophysiology is defined as the study of psychologic phenomena (cognition, emotion, and behavior) as related to physiologic events, and this relationship is revealed through these physiologic events or manifestations (Cacioppo & Tassinary, 1990; Surwillo, 1986). The distinction of psychophysiology from other related biobehavioral fields comes in the identification of the variables under investigation. In psychophysiology, the independent variable is the psychologic event or behavior (for example, anxiety), and the dependent variable is the physiologic phenomenon (for example, change in heart rate) (Andreassi, 1989; Cacioppo & Tassinary, 1990; Surwillo, 1986).

The psychologic and physiologic variables of psychophysiology are innumerable and range in intensity. Psychological variables encompass a variety of behavioral activities, such as problem solving, perceiving, learning, sensing and emotional response (Andreassi, 1989). As a result of such psychologic events, any number of physiologic phenomena might occur, for example, change in heart rate and respirations, increased blood pressure, fatigue, muscle tension, increased infections, and even changes in immunity (Andreassi, 1989; Asterita, 1985; Sutherland, 1991). The relationships among various psychologic and physiologic events have been topics of research for over a century, but the most recurrent theme is stress and its physiologic manifestations (Grossbach-Landis, 1980; Kline Leidy, 1989; Kline Leidy, Ozbolt, & Swain, 1990; Langner & Innes, 1980; Selye, 1950, 1974, 1978; Sutherland, 1991).

The concept of psychophysiology is not new to the profession of nursing as nursing has always practiced from a holistic approach. In fact, since its inception, nursing expanded the medical view of the mind-body interaction and added a third, spiritual, dimension (Nightingale, 1859). The interactive effect of this mind-body-spirit triad is the essence of psychophysiology.

Stress

As previously mentioned, one psychophysiologic event studied frequently by researchers and health care providers is stress and its physiologic manifestations. Defined by Selye (1974), stress is a nonspecific physiologic response to any demand. Selye defined these demands as stressors, which are any physical, mental, or emotional influence perceived by the person as a threat (Selye, 1950, 1974; Tache & Selye, 1985).

The Stress Response

The psychologic stressor of weaning, when perceived as threatening, stimulates the stress response and compounds the physiologic difficulties of weaning. The stress response is elicited by the hypothalamus which stimulates the sympathetic nervous system, resulting in activation of the adrenal medulla (Grossbach-Landis, 1980; Kline Leidy, 1989; Selye, 1950, 1974). Adrenal medulla activation results in the release of catecholamines, specifically epinephrine and norepinephrine. Physiologic manifestations of increased catecholamine levels include increased heart rate, increased respirations, increased muscle tension, and a generalized state of hyperactivity (Asterita, 1985; Grossbach-Landis, 1980), all of which contribute to an increased work of breathing and ultimately affect successful adaptation to weaning.

The Relaxation Response

From this psychophysiologic perspective of the effects of stress on weaning, a goal of nursing intervention is to assist the patient in perceiving weaning as nonthreatening by eliciting relaxation. According to Benson (1975), the relaxation response causes a reduction in sympathetic nervous system activity, and is exhibited by a decrease in respiratory rate, heart rate, blood pressure, and basal metabolic rate with resulting decreased oxygen consumption and carbon dioxide production, which is opposite to the stress response (Benson, 1975, 1979; Miller & Perry, 1990). These physiologic manifestations of relaxation result in augmentation of the patient's adaptation from dependent ventilation to independent respiration, which may ultimately decrease weaning time.

Relaxation Techniques and Weaning

Several studies have been conducted to determine the ability of various techniques to elicit the relaxation response and promote weaning from mechanical ventilation. One method of relaxation examined was the use of verbal and tactile interaction between nurse and patient. In 1989, Henneman examined the effects of verbal interaction and touch on the relaxation response of 26 patients during T-piece weaning. With the control group, the nurse remained in the room but did not interact with the patients, whereas the treatment group received both verbal and tactile interaction (hand holding). No significant differences were found in the heart rate, respiratory rate, and blood pressure between the treatment group and the control group.

Biofeedback is another method which has been extensively investigated as a means of augmenting weaning. One study conducted by Corson, Grant, Moulton, Green, and Dunkel (1979) examined the effects of biofeedback in attempting to wean two paralyzed patients. During the biofeedback sessions, the patients were shown a display of their tidal volumes on an oscilloscope. With each session, the highest tidal volume reached determined the target tidal volume for the next session, resulting in progressive improvement of respiratory function and eventual weaning. Although this study did not examine the effect of biofeedback on the relaxation response, successful weaning of both difficult-to-wean patients developed a basis for further research regarding biofeedback and its effects on weaning.

Holliday and Hyers (1990) conducted a controlled study examining the effects of biofeedback on weaning. Forty patients were randomly assigned to either a control group receiving reassurance, or the treatment group receiving both tidal volume and relaxation biofeedback. The findings showed those receiving the biofeedback were weaned 12 days sooner than those in the control group. In addition, the relaxation biofeedback group showed improved coordinated breathing patterns and decreased upper intercostal muscle tension, both indicative of the relaxation response.

Another study conducted by LaRiccia et al. (1985) used eight sessions of biofeedback and biofeedback during hypnosis to successfully wean a patient with respiratory failure secondary to multiple sclerosis with transverse myelitis. Each session consisted of a period of biofeedback alone and then a period of biofeedback with hypnosis. Although both methods were effective in improving breathing patterns indicative of anxiety, biofeedback during hypnosis had a more profound effect. Similar results were found in a case report by Acosta (1988) in which biofeedback and progressive relaxation sessions were given to a failure-to-wean chronic obstructive lung disease patient. These sessions resulted in decreased heart and respiratory rate coinciding with an increase in oxygen saturation, in addition to successful weaning from the ventilator.

Imagery

Imagery is another mode of relaxation therapy which has been the subject of several research studies in recent years (Holden-Lund, 1988; King, 1988; Stephens, 1992;

Wynd, 1992a, 1992b). Findings indicate it is a very effective method of eliciting the relaxation response; however, no research was found examining its effects during weaning from mechanical ventilation.

Achterberg and Lawlis (1982) define imagery as mental images acting as a bridge between mind and body. These internal representations, or mental pictures, are experienced through one or all of the five senses, and once internalized can alter physiologic function, specifically the autonomic nervous system (Achterberg & Lawlis, 1982; Fezler, 1989; Sodergren, 1985). This mind/body connection is accomplished through a sequenced chain of events (Achterberg & Lawlis, 1982). First, the person perceives the presence of an event or object, and this perception is accomplished through the senses. Next, the event or object is labeled according to the person's past experience, which in turn leads to an emotional response. This emotional response stimulates the next step, planning imagery, which involves a split-second decision on what to do with the object, or how to react to the event. Once this decision is made, an immediate physiologic response occurs, and depending on interpretation of the event or object, this response can be either the stress response or the relaxation response (Achterberg, 1985; Achterberg & Lawlis, 1982). The final step is behavioral reaction during which resulting physiologic actions are observed.

The psychophysiologic process of imagery is very complex and still under study, with the actual mechanisms still under investigation. Several theorists propose that the major structures involved are the cerebral cortex, the limbic system within the brain, and the hypothalamus (Achterberg, 1985; Sodergren, 1985; Vines, 1988). Although the exact actions are unclear, theorists agree that imagery evokes emotion, which in turn elicits an unconscious physiologic response.

One use of imagery in health care focuses on conscious control of emotions in order to gain control over autonomic function (Achterberg & Lawlis, 1982; Sodergren, 1985). The method of conscious control over emotions is best described by Burns (1980) in his discussion of cognitive therapy and the relationship between thoughts and emotions. Burns states that all emotions, or feelings, are derived from thoughts, and these thoughts are the interpretations of events as perceived by the individual experiencing the events. As a result, these perceived thoughts are given a conscious meaning which then elicits an emotional response. Because experiences evoke both positive and negative thoughts with resulting positive or negative emotions, one goal of imagery is to awaken positive thoughts leading to positive emotions, thereby inducing a state that facilitates health (Achterberg & Lawlis, 1982). Imagery is one such powerful method of helping patients communicate non-verbally, or cognitively, with their own bodies to achieve a state which enhances recovery and wellness (Achterberg & Lawlis, 1982; Sodergren, 1985; Vines, 1988).

Imagery Research

Researchers are continually studying new uses for imagery in health care, and the findings indicate imagery is an effective means of reducing stress, which results in changes in the autonomic nervous system. Imagery is also useful in helping persons achieve a desired behavior or outcome. Wynd (1992a, 1992b) conducted two studies examining the use of imagery in persons who smoked. In one study, relaxation imagery was investigated for its effectiveness in reducing stress and preventing relapse in 76 persons that had quit smoking (Wynd, 1992b). Findings indicated those persons in the group who had received imagery training exhibited greater stress reduction and greater abstinence over time than those in the control group who received no imagery training.

In another study, Wynd (1992a) experimented with guided imagery and relaxation techniques to determine their effectiveness with smoking cessation. The study consisted of 84 adult smokers assigned to three treatment groups: personal power imagery, relaxation imagery, and control. Results of the study demonstrated that persons in both personal power imagery and relaxation imagery groups had greater rates of cessation over time than those in the control group who received no imagery.

The relationship between imagery and anxiety is another research area. Holden-Lund (1988) conducted a study examining the effects of relaxation with guided imagery on state anxiety, urinary cortisol levels, and wound inflammatory responses in 24 postoperative cholecystectomy patients. Patients receiving relaxation with guided imagery demonstrated notably less state anxiety, lower cortisol levels one day after surgery, and less incisional erythema than those in the control group who received no imagery. Heath (1992) related significant reduction in anxiety with one particular difficult-to-wean postoperative coronary artery bypass patient. After imagery, the patient became less tense during the weaning process as exhibited by a relaxed posture and ability to sleep for several hours after imagery sessions.

Other studies exploring the effects of imagery on student anxiety report success. King (1988) examined the effects of relaxation with guided imagery on state and trait anxiety levels among 33 graduate nursing students. After three sessions of relaxation with guided imagery state anxiety levels decreased, but returned to previous levels within 2 weeks. In addition, no difference was noted in trait anxiety scores. In another study conducted by Stephens (1992), 159 female nursing students were randomly assigned to three treatment groups: imagery, progressive relaxation with imagery, and no treatment. Anxiety scores in both treatment groups exhibited statistically significant improvement as compared to the control group; however, there was no significant difference between the two treatment groups.

Theoretical Framework

The focus of this pilot study was the reduction of stress in patients during weaning from mechanical ventilation. It was proposed that the use of imagery promotes weaning of mechanically ventilated COPD patients by decreasing the effects of stress through induction of the relaxation response. From this psychophysiologic perspective, the Neuman Systems Model provides the nursing theoretical framework for this study.

Neuman Systems Model

The Neuman Systems Model is founded on systems theory and is a holistic and multidimensional approach to nursing care (Burney, 1992; Neuman, 1989). Based on Selye's work of stress, the model's design encompasses the client (as a system consisting of five variables) and his/her dynamic interaction with the influences of internal and external environmental stressors (Neuman, 1989). Neuman considers this a wellness model in which nursing's primary goal is to assist the client in attaining and maintaining optimal wellness in a stable state. Nursing accomplishes this through interventions which attempt to reduce the effects of stressors (Neuman, 1980).

<u>Concepts</u>. Four concepts are inherent in the Neuman Systems Model: person, environment, health, and nursing. The person is viewed as an interactive open system composed of five interrelated variables: physiological, psychological, sociocultural, developmental, and spiritual (Neuman, 1982, 1989). Each variable differs in its degree of development and interaction with the client and the environment. Neuman (1989) also pictures the person as a series of concentric circles surrounding a core (see Figure 1). The core, or basic structure, is made of fundamental aspects of survival common to all human beings, such as genetic structure and temperature range (Neuman, 1989; Ross & Bourbonnais, 1985). Surrounding the core are lines of resistance which help the organism maintain a homeostatic state of wellness, as exemplified by the mechanisms for temperature control and the immune system (Neuman, 1989; Ross & Bourbonnais, 1985). These lines of resistance serve to protect the basic structure from stressor penetration, which if occurred, could result in death.

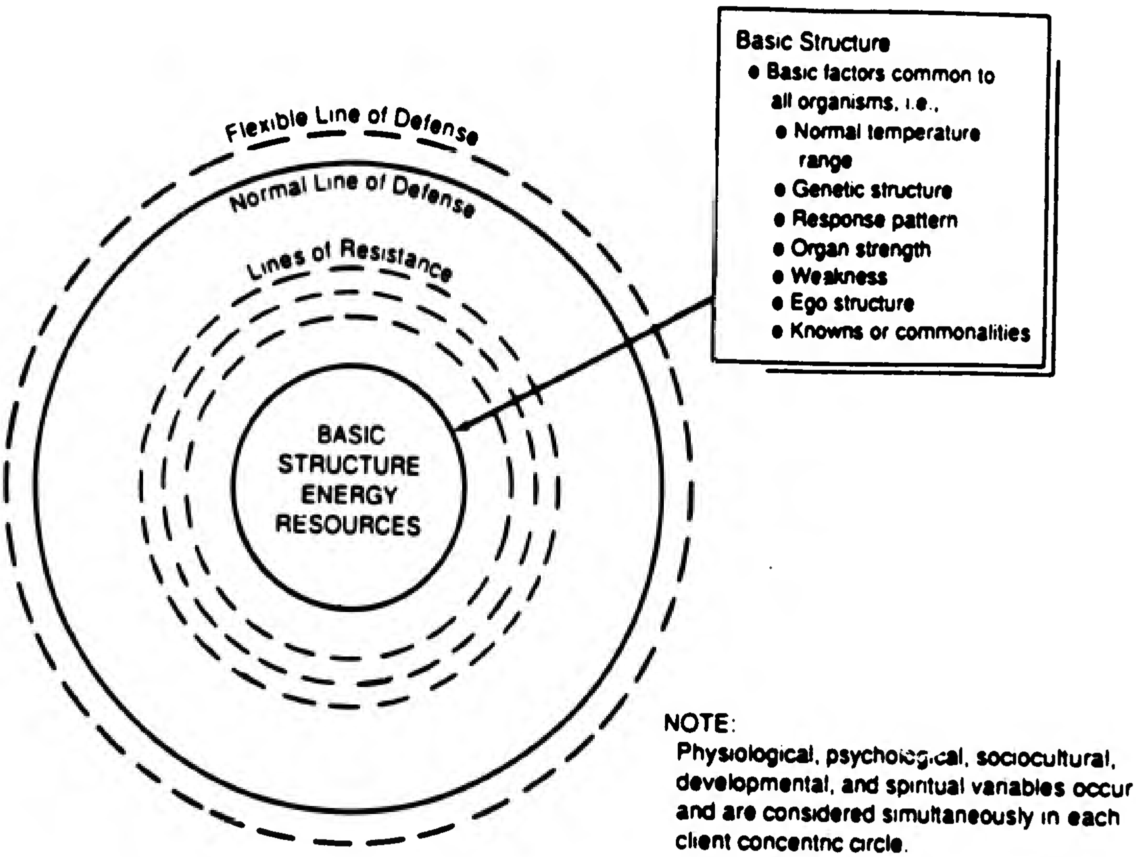

Figure 1. Client/client system of the Neuman Systems Model.

Note. From The Neuman Systems Model (2nd ed.) (p. 28) by B. Neuman, 1989. Norwalk, CT: Appleton & Lange. Copyright by Appleton & Lange.

Next, encircling the lines of resistance is the normal line of defense, or usual wellness level, and represents the person's adaptation to previously encountered stressors, or what the person has become over time (Neuman, 1989). This wellness level is determined by how the client reacts to environmental stressors within each of the five client variables as mentioned above. The flexible line of defense is the last structure formed outside the normal line of defense and acts as a buffer to stressors (Neuman, 1989). Described as accordion-like and dynamic, it has the ability to change as new variables are introduced, such as rest and exercise, which increase the system's resistance. The capability of each of these lines of resistance and defense to deal with stressors is influenced by the five client variables.

Neuman broadly describes environment as all internal and external forces that influence the client (Neuman, 1982, 1989). This influence may be positive or negative depending on how the client perceives it. The environment is further divided into three types: internal, external, and created (Neuman, 1989). The internal environment consists of those influences within the client, the external is that which exists outside of the client. By created-environment, Neuman refers to that environment which is created by exchange of energy, or interaction, between the internal and external environments.

The created-environment is ever-changing, and even though unconsciously developed, its purpose is to insulate the system so that it may function safely (Neuman, 1989). This insulation effects changes in the way the client responds to stressors, and these changes are then incorporated into the flexible lines of defense. For example, using denial or hope when confronted with a particular environmental stressor, such as illness of a family member, helps protect the individual from the stressor. Thus, this protective mechanism strengthens the lines of defense and results in a created-environment which promotes the client's health.

According to Neuman (1989), health is synonymous with client system stability, or an optimal wellness state. It is viewed in terms of a continual energy exchange between the client system and the environment. Wellness and illness are on a continuum, where wellness generates more energy than is being used and illness uses more energy than generated.

The primary goal of nursing is to assist the client in attaining and maintaining an optimal level of wellness, or stability (Neuman, 1989). Nursing achieves this through three levels of intervention (Neuman, 1989). The first is primary prevention which aims to preserve wellness by strengthening the client's normal line of defense through identification and prevention of the effects of potential stressors. Secondary prevention is focused on wellness attainment by strengthening the internal lines of resistance, or reversing maladaptive responses already exhibited. The third level of intervention is tertiary, and is used when both primary and secondary interventions have failed. The goal at this level is to return the client to wellness after treating the effects of the stressors and using remaining resources to prevent further manifestations of stress.

Neuman Systems Model Applied

The use of the Neuman Systems Model as the framework for this study is easily conceptualized. The COPD patient on the mechanical ventilator is confronted with a multitude of both internal and external environmental stressors. When the weaning process is added to those stressors already present, the additive effects, as exhibited by parameters of weaning and other clinical signs, indicate weaning failure. Indications of weaning failure denote penetration of both the normal and flexible lines of defense, resulting in a more compromised state of wellness. The goal of nursing is to assist the patient to strengthen the created environment, thereby achieving independent respirations. When independent respirations have been achieved, the patient has reached a higher state of wellness than the state he/she was in when dependent upon mechanical ventilation.

Imagery is proposed as a means of nursing intervention to help achieve this goal, and may be effective at any level of intervention with mechanically ventilated COPD patients. At the primary level, imagery can be used to induce the relaxation response in ventilator patients before they come into contact with the stress of weaning. Manifestations of the relaxation response would then ready the patient to more easily adapt to the physiologic stress of weaning, and prevent the impending process from becoming psychologically stressful. In essence, this would place the patient in an optimal created-environment conducive to successful weaning.

At the secondary level, the patient may be manifesting signs of stress in response to the following stressors: the disease state of COPD; the prospect of impending weaning trials; or weaning trials which have already begun. By introducing imagery and inducing the relaxation response, the intervention counteracts the already present maladaptive responses to the stressors and strengthens the normal line of defense. In doing so, the intervention has created a more conducive environment for successful weaning by improving weaning parameters. Using imagery as an intervention at the tertiary level is very similar; however, patients at this level will have already failed to wean or will be encountering difficulty during the process. When used at this stage, imagery assists the patient in reaching the best state possible to attempt and succeed at weaning, and will be reflected in the improvement of weaning parameters. This study proposed imagery as a means of intervention at the secondary level.

As Neuman (1989) described, the goal of the created-environment is to promote health, and the goal of nursing is to assist clients in attaining and maintaining an optimal level of wellness. As indicated above, it was proposed that imagery, as a nursing intervention, can assist ventilated COPD patients reach both of these goals.

Summary

This chapter presented a review of literature. It began with a discussion of psychophysiology as related to the stress and relaxation responses. Next, the chapter covered research pertinent to weaning from mechanical ventilation and experimentation with several relaxation techniques. Imagery was then examined as a means of mediating the relaxation response, and related research studies explored. Finally, the Neuman Systems Model was presented as the nursing theoretical framework for the study.

CHAPTER 3

Methodology

Introduction

The following chapter describes the method which was used to conduct the study. It begins with a brief description of the study design, followed by a description of the sample. The chapter will also cover data type and collection, as well as materials and equipment. Finally, the chapter concludes with an in-depth discussion of the procedure which was followed during the course of the study.

Design

This was an experimental study designed to determine the effects of audiotaped imagery on weaning parameters in chronic obstructive pulmonary disease (COPD) patients. Patients who fit the criteria for enrollment were randomly assigned by a random numbers table to either the control group receiving audiotaped pink noise, or the treatment group receiving audiotaped imagery of a meadow scene.

Sample

The sample consisted of COPD patients on mechanical ventilators. Because of a fluctuating patient census, a convenience sample was used. The sample consisted of those patients who met the following criteria and were hospitalized in two Southwestern hospitals between the dates of October 15, 1993 and February 1, 1994.

1. Primary diagnosis of COPD with acute respiratory failure.

2. On standard weaning protocol of IMV with positive end expiratory pressure (PEEP) support.

3. Ventilated for 72 hours or more.

4. Baseline MAP of greater than 60.

5. Free of hemodynamically compromising arrhythmias for past 24 hours.

6. Stable hemoglobin and hematocrit.

7. Have not had myocardial infarction or coronary artery bypass graft surgery this hospitalization.

8. Comprehends and speaks English.

9. Alert and able to follow simple commands.

10. Give written consent for participation in the study.

11. Hearing intact.

Materials and Equipment

All instruments and forms used for data collection are described in the following section. Special equipment used for the audiotaped imagery and pink noise is also described.

Intervention and Control

The intervention for this study was an imagery audiotape developed by using a meadow scene (see Appendix A). The dialogue for this study was developed for and used extensively with critical care patients, including patients with respiratory difficulties and patients on mechanical ventilation. The effects which were noted to occur are decreased respiration, decreased shortness of breath, and decreased agitation (A. H. Heath, personal communication, June 6, 1993). Administration of the imagery audiotape was by means of cassette player and headphones.

The control measure chosen for this study was pink noise via audiotape (see Appendix A). The difference between white noise and pink noise is pink noise is simply filtered white noise. According to Kluff (personal communication, January 24, 1994), "White noise is broad band random acoustical energy with a constant spectrum level between F_1 (lower level) and F_2 (higher level)." As a result, white noise increases in band level at 3 decibels per octave and this increasing level is often irritating to the ear. In contrast, pink noise is white noise that has passed through a -3 decibel per octave filter causing the spectrum level to decrease by 3 decibels per octave. The end result is a constant band level rather than constant spectrum level. Because of this, pink noise is preferred for use in various acoustical tests because it is more pleasing to the ear than white noise (J. Kluff, personal communication, January 24, 1994). The pink noise audiotape was also administered by means of cassette player and headphones.

Data-Collection Instrument

Data were collected using two instruments, the Demographic Data Sheet (Appendix B) and the Weaning Parameter Flow Sheet (Appendix C). The information gathered using the Demographic Data Sheet included age, gender, days on the ventilator, height, and weight. Additional data collected were previous episodes of ventilation, reason for hospitalization, and disease processes present in patient. Also, medications given within the last 12 hours (other than those which would cause alterations in level of consciousness) and any medications given which may have altered the patient's level of consciousness and/or affected weaning parameters were recorded. Final data collected on the Demographic Data Sheet were albumin level and pre-albumin level.

The Weaning Parameter Flow Sheet was used to collect data during the time of intervention (administration of the audiotaped imagery and audiotaped pink noise). Data collected on this flow sheet began with two sets of pre-intervention weaning parameters (heart rate, mean arterial blood pressure, respiratory rate, frequency of respiratory rate to tidal volume, and oxygen saturation). Intervention start and stop times were then noted. Next, two sets of postintervention weaning parameters were recorded. The final data collected on the weaning Parameter Flow Sheet consisted of whether the patient had any previous experience with imagery, if any interruptions had occurred during the intervention or pre- and post-30-minute periods, and if the intervention had been stopped before completion with an explanation of why.

Equipment and Materials

See Appendix A for the dialogue of the imagery audiotape. The pink noise audiotape used for the control group, the imagery audiotape used in the experimental group, cassette tape player, and headphones were supplied by the researcher. In addition, the batteries in the cassette tape player were replaced after every six patients, or after 1½ hours of use.

Procedure

Before data collection could begin, approval for this research study was obtained from the Human Subjects Institutional Review Board at Arizona State University and the Nursing Research Committee of a Southwestern health system (which contains four medical centers within close proximity in the same city). After approval of both agencies was received, the researcher met with the pulmonary committee, the clinical director, and nursing staff at medical center A (a member of the health system) to introduce and describe the study. Due to insufficient sample size, the population of the study was extended to include those patients at a second Southwestern medical center (a member of the health system). Permission from physicians to approach potential subjects regarding participation in the study was obtained on an individual basis at the second medical center and at the first medical center for those physicians who had not attended the pulmonary committee meeting.

An aspect of the study which was discussed and developed with the nursing staff was a communication network between nursing staff and researcher. As the researcher was the primary data collector and did not work within the unit where data were collected, the staff and critical care clinical nurse specialist notified the researcher of all admitted COPD patients who fit the enrollment criteria for the study. In order to remind the staff to notify the researcher of potential subjects, bright-colored flyers were placed on each staff bulletin board within the unit. These flyers contained the name of the study, type of patient for possible enrollment in the study, enrollment criteria, name of the researcher, and telephone number of the researcher. In addition, every three days the researcher contacted the nursing staff within the unit to determine if any patients were admitted that fit the enrollment criteria.

Once notified of potential enrollees for the study, and after patients had been determined to fit the criteria for inclusion, the clinical nurse specialist or a designated staff member approached the patient to request permission for the researcher to discuss his/her possible participation in the study. Once permission was obtained, the researcher approached the patient using the dialogue found in Appendix D. This dialogue consisted of a brief background of the researcher, the purpose of the study, exactly what the patient was required to do if he/she participated, the amount of time required for participation, and what the researcher would do during that time. The potential participant was then informed that participation would in no way change or alter his/her current treatment and that no risks or discomforts were associated with participation in the study. In addition, the researcher informed the patient that participation was voluntary and if he/she decided to participate, he/she could withdraw at any time without penalty. Finally, the patient was told that if he/she agreed to participate, he/she must sign a letter of consent (see Appendix E). The patient was given a pad and pen to communicate any questions or concerns regarding the study. The researcher then obtained informed consent per patient signature on the letter of consent.

After potential participants signed the consent form, the researcher immediately began data collection and treatment administration. Data collection consisted of demographic information obtained from the patient chart and four sets of weaning parameters. Demographic information was collected and documented using the Demographic Data Sheet found in Appendix B, and consisted of: age; gender; height; weight; number of days on the ventilator; previous episodes of mechanical ventilation; reason for hospitalization; other disease processes present; medications taken within the last 12 hours; and albumin and prealbumin levels.

Weaning parameters were documented on the Weaning Parameter Flow Sheet found in Appendix C. Parameters read from the Bennett 7200 ventilator at both facilities were the respiratory rate (RR) and ratio of respiratory frequency to tidal volume (f/V_T). The heart rate (HR) was obtained from Hewlett-Packard Bedside Cardiac Monitors at both facilities. The mean arterial blood pressure (MAP) was calculated after manually obtaining systolic and diastolic blood pressures by stethoscope and sphygmomanometer, and using the following formula: MAP = systolic + 2(diastolic) / 3. Oxygen saturation (SaO_2) was read from the Criticon Pulse Oximeter at the first medical center and from the Hewlett-Packard Bedside Cardiac Monitor at the second medical center. The researcher documented any interruptions or disturbances which occurred during the intervention and the 30 minute pre- and postintervention periods on the Weaning Parameter Flow Sheet (see Appendix C). In addition, after the treatment was completed, the researcher asked the subjects, and documented on the Parameter Flow Sheet, whether they had any previous experience with imagery.

The procedure for data collection and treatment (audiotaped imagery) or control (pink noise audiotape) lasted approximately 1½ hours. However, before beginning, the researcher determined whether the subject had undergone any strenuous procedures or treatment for 1 hour prior to starting the treatment. The researcher also coordinated data collection and treatment time with the nursing staff to assure no procedures or treatments were scheduled for that time. This coordination was important to assure minimal distraction or interruptions during the time needed for data collection and treatment, and assured the time did not disrupt patient care. Once the researcher determined the patient was ready and coordination with the nursing staff was done, data collection began and was accomplished in the subject's room.

Initially, in both control and treatment groups, demographic data and one set of weaning parameters were obtained and the weaning parameters repeated in 30 minutes. After the second set of parameters were taken, the pulse oximeter was left on the subjects for continuous monitoring. The subjects in both groups were then asked or assisted in assuming a comfortable position and the researcher then assisted him/her in placing the headset and cassette player. During placement of the blood pressure cuff and pulse oximeter probe, contact between researcher and subject was kept at a minimum, using only contact necessary for correct placement. The subjects in the control group listened to the pink noise audiotape (see Appendix A for dialogue), and the subjects in the treatment group listened to the imagery audiotape (see Appendix A for dialogue). During the time the subject was listening to the tape, the researcher left the room, but positioned herself so the pulse oximeter and cardiac monitor could be read at all times. Upon completion of the audiotape a set of weaning parameters were taken immediately and repeated in 30 minutes. The subject was then asked if he/she had any previous experience with imagery. This concluded data collection for subjects in both the treatment and control groups.

Confidentiality of participants in this study was maintained throughout the procedure and after completion of the project. This was assured by not using or documenting the individual's name in conjunction with any collected information. Instead, a subject code was assigned to the data collection sheets (see Appendices B and C) and was the only means of identification for the purposes of the study. In addition, data analysis is presented in composite form. After data analysis, the subject codes were removed from the data sheets and destroyed. Signed consent forms were then secured in the official files of Shirley Bell, RN, EdD, Assistant Professor, College of Nursing, Arizona State University.

Data Analysis

Analysis of data consisted of the following methods. First, demographic data of both the control and treatment groups were analyzed by means of frequency distributions. The information collected consisted of: age; gender; number of days on the ventilator; previous episodes of mechanical ventilation; reason for hospitalization; other disease processes present; and medications taken within the last 12 hours. In addition, t tests for independent samples were conducted to determine any significant differences between the control and treatment groups.

Next, in order to demonstrate any significant changes in parameters (HR, RR, MAP, f/V_T, and SaO_2) before and after treatment in subjects of both the treatment and control groups, paired t tests were conducted to determine the mean change in each parameter, and determine any significance in the changes. Then, by using the mean changes of these parameters from both groups, t tests for independent samples were performed to determine if significant differences existed between the control and treatment groups.

Summary

This chapter contained a description of the method the researcher used to conduct the study. A brief description of the study design, followed by a description of the sample was first given. Next, the chapter discussed data type and collection, as well as the materials and equipment necessary to carry out the study. The procedure followed during the course of the study was then presented in-depth. The chapter concluded with a description of the data analysis used.

CHAPTER 4

Results

Introduction

The purpose of this pilot study was to investigate imagery as a means of improving weaning parameters in mechanically ventilated chronic obstructive pulmonary disease (COPD) patients through reduction of stress. Research questions asked whether the use of imagery in COPD patients during the stressful period of weaning provides a psychological means of producing physiologic relaxation. Physiologic relaxation was measured via changes in five parameters: heart rate (HR), respiratory rate (RR), mean arterial blood pressure (MAP), the ratio of respiratory frequency to tidal volume (f/V_t), and oxygen saturation (SaO_2). This chapter describes the research findings and is divided into three sections: (a) characteristics of the sample, (b) research questions, and (c) additional findings.

Characteristics of the Sample

A convenience sample of subjects in the intensive care units of two large southwest medical centers was obtained from October 15, 1993 to February 1, 1994. Nine patients met the study's inclusion criteria, of which six agreed to participate. Of these six subjects, three were in the treatment group and three were in the control group. The sample consisted of three females and three males ranging in age from 48 to 76 years. Mean age of the subjects was 65.8 years, with a standard deviation of 11.43. In the treatment group mean age was 59.3 years and mean age in the control group was 72.3 years. Days on the ventilator ranged from 3 to 9 days, with a mean of 4.8 days. Four subjects reported no previous episodes of mechanical ventilation, and two were unknown. Five subjects had respiratory complications in addition to the primary diagnosis of COPD. These respiratory complications consisted of pneumonia in four subjects and pneumonitis in one subject.

Additional data collected included indicators of nutritional status (albumin and pre-albumin). The albumin levels of all six patients ranged from 2.4 to 4.0 grams/dL with a mean of 3.2 (normal range 3.5 to 5.5 grams/dL). However, only two patients had pre-albumin levels which were 10 and 26 mg/mL (normal range 15.7 to 29.6 mg/mL).

Data collected also consisted of medications given within 12 hours of data collection which may have affected level of consciousness and/or resulted in changes in any of the five weaning parameters. Of the six subjects, one had not been given any of these medications within 12 hours of data collection. The other five subjects had been given one or two of the five listed medications within 12 hours of data collection. Of those five, one had morphine sulfate and diazepam, one had only morphine sulfate, one had lorazepam and haloperidol lactate, one had only haloperidol lactate, and one had morphine sulfate and midazolam hydrochloride. During data collection, the researcher was not required to return to any of the six patients' bedside due to agitation or patient instability while listening to the audiotape. In addition, there were no interruptions during data collection.

Research Questions

Research Question 1

Research question 1 asked what effect does audiotaped imagery have on heart rate (HR) in the ventilated COPD patient. A paired *t* test was performed to compare mean heart rate values within groups pre- and postintervention, and a *t* test for independent samples was performed to compare mean changes in heart rate between groups. Findings in the audiotaped imagery group were mean heart rate of 105.8 (*SD* = 11.3) preintervention and 111.2 (*SD* = 23.8) postintervention, with a mean change of 5.3 (15.3), $t(2) = -.60$, $p = .608$. In the audiotaped pink noise group, mean heart rate was 79.2 (*SD* = 8.1) preintervention and 86.8 (*SD* = 17.8) postintervention, with a mean change of 7.7 (*SD* = 9.9), $t(2) = -1.34$, $p = .313$ (see Table 1). Results of the *t* test for the mean changes in heart rate between the imagery and pink noise groups were $t(4) = -.22$, $p = .836$ (see Table 2). This was not statistically significant at the $p = .05$ level.

Table 1

Mean Parameter Scores for Audiotaped Imagery and Audiotaped Pink Noise Groups With t-Test Results Within Groups

Parameter	Group	Pre-M	SD	Post-M	SD	t	p
HR	1	105.8	11.3	111.2	23.8	-0.60	.608
	2	79.2	8.1	86.8	17.8	-1.34	.313
RR	1	25.2	12.3	23.0	2.6	0.31	.784
	2	17.2	7.7	20.8	6.7	-3.14	.088
MAP	1	109.8	10.7	106.7	15.4	0.98	.429
	2	89.7	23.5	97.3	21.4	-1.59	.252
f/V_t	1	39.5	22.5	40.3	11.3	-0.06	.955
	2	31.7	21.5	40.7	23.9	-3.27	.082
SaO_2	1	93.5	1.5	95.2	1.6	-2.77	.109
	2	94.5	1.8	93.8	2.1	4.00	.057

Note. Group 1 is the audiotaped imagery group.
Group 2 is the audiotaped pink noise group.
Pre-*M* is the preintervention mean.
Post-*M* is the postintervention mean.

Table 2

Mean Change Parameter Scores for Audiotaped Imagery and Audiotaped Pink Noise Groups With t-Test Results Between Groups

Parameter	Group	*M*	*SD*	*df*	*t*	*p*
HR	1	5.3	15.3	4	-0.22	.836
	2	7.7	9.9			
RR	1	-2.2	12.0	4	-0.83	.453
	2	3.7	2.0			
MAP	1	-3.2	5.6	4	-1.90	.134
	2	7.7	8.3			
f/V_t	1	0.8	22.7	4	-0.61	.575
	2	9.0	4.8			
SaO_2	1	1.7	1.0	4	3.74	.020*
	2	-0.7	0.3			

Note. Group 1 is the audiotaped imagery group.
Group 2 is the audiotaped pink noise group.

* $p < .05$.

Research Question 2

Research question 2 asked what effect does audiotaped imagery have on respiratory rate (RR) in the ventilated COPD patient. A paired *t* test was performed to compare mean values of respiratory rate within groups pre- and postintervention, and a *t* test for independent samples was performed to compare mean changes in respiratory rate between groups. Mean respiratory rate for the audiotaped imagery group was 25.2 (SD = 12.3) preintervention and 23.0 (SD = 2.6) postintervention, with a mean change of -2.2 (SD = 12.0), $t(2) = .31$, $p = .784$. In the audiotaped pink noise group, mean respiratory rate was 17.2 (SD = 7.7) preintervention and 20.8 (SD = 6.7) postintervention, with a mean change of 3.7 (SD = 2.0), $t(2) = -3.14$, $p = .088$ (see Table 1). Results for the mean changes in respiratory rate between the imagery and pink noise groups were $t(4) = -.83$, $p = .453$ ($p > .05$). (see Table 2).

Research Question 3

Research question 3 asked what effect does audiotaped imagery have on mean arterial blood pressure (MAP) in the ventilated COPD patient. A paired *t* test was performed to compare mean values of mean arterial blood pressure within groups pre- and postintervention, and a *t* test for independent samples was performed to compare the mean changes in mean arterial blood pressure between groups. The means for mean arterial blood pressure in the audiotaped imagery group were 109.8 (SD = 10.7) preintervention and 106.7 (SD = 15.4) postintervention, with a mean change of -3.2 (SD = 5.6), $t(2) = .98$, $p = .429$. In the audiotaped pink noise group, means for mean arterial blood pressure were 89.7 (SD = 23.5) preintervention and 97.3 (SD = 21.4), with a mean change of 7.7 (SD = 8.3), $t(2) = -1.59$, $p = .252$ (see Table 1). Results for the mean changes in mean arterial blood pressure between groups were $t(4) = -1.9$, $p = .134$ ($p > .05$) (see Table 2).

Research Question 4

Research question 4 asked what effect does audiotaped imagery have on the ratio of respiratory frequency to tidal volume (f/V_t) in the ventilated COPD patient. A paired t test was performed to compare mean values of respiratory frequency to tidal volume within groups pre- and postintervention, and a t test for independent samples was performed to compare mean changes in respiratory frequency to title volume between groups. Mean ratios of respiratory frequency to tidal volume in the audiotaped imagery group were 39.5 (SD = 22.5) preintervention and 40.3 (SD = 11.3) postintervention, with a mean change of .8 (SD = 22.7), $t(2) = -.06$, $p = .955$. In the audiotaped pink noise group, mean ratios were 31.7 (SD = 21.5) preintervention and 40.7 (SD = 23.9) postintervention, with a mean change of 9.0 (SD = 4.8), $t(2) = -3.27$, $p = .082$ (see Table 1). Findings for the mean changes in ratio of respiratory frequency to tidal volume between groups were $t(4) = -.61$, $p = .575$ ($p > .05$) (see Table 2).

Research Question 5

Research question 5 asked what effect does audiotaped imagery have on oxygen saturation (SaO_2) in the ventilated COPD patient. A paired t test was performed to evaluate mean changes in oxygen saturation within groups and a t test for independent samples was performed to compare mean changes in exygen saturation between groups. Mean oxygen saturation in audiotaped the imagery group were 93.5 (SD = 1.5) preintervention and 95.2 (SD = 1.6) postintervention, with a mean change of 1.7 (1.04), $t(2) = -2.77$, $p = .109$. In the audiotaped pink noise group, mean oxygen saturations were 94.5 (SD = 1.8) preintervention and 93.8 (SD = 2.1) postintervention, with a mean change of -0.7 (SD = 0.3), $t(2) = 4.0$, $p = .057$ (see Table 1). Results for the mean change in oxygen saturation between groups were $t(4) = 3.74$, $p = .02$. At the $p = .05$ level, these findings indicate a statistically significant difference in the mean changes in mean preintervention and postintervention oxygen saturation scores between groups. In other words, comparison of mean changes between groups demonstrated a statistically significant greater change in oxygen saturation among those in the audiotaped imagery group than in the oxygen saturation of the audiotaped pink noise group (see Table 2).

Research Question 6

Research question 6 asked if gender affected the response of ventilated COPD patients to audiotaped imagery. Due to insufficient sample size, it was not possible to determine the effects of gender on the response to imagery, as the female to male ratio in the audiotaped imagery group was 2:1.

Research Question 7

Research question 7 asked if age affected the response of ventilated COPD patients to audiotaped imagery. As with gender, due to insufficient sample size, it was not possible to determine the effect of age on the response to audiotaped imagery.

Additional Findings

Although only the differences in mean changes in oxygen saturation means were statistically significant, it is important to examine the direction of change for each parameter and compare this direction of change between groups. The trend for each parameter was different. Comparison of heart rate means showed an upward change (increase in heart rate) for both the audiotaped imagery group and the audiotaped pink noise group (see Figure 2). In mean respiratory rates, the audiotaped imagery group

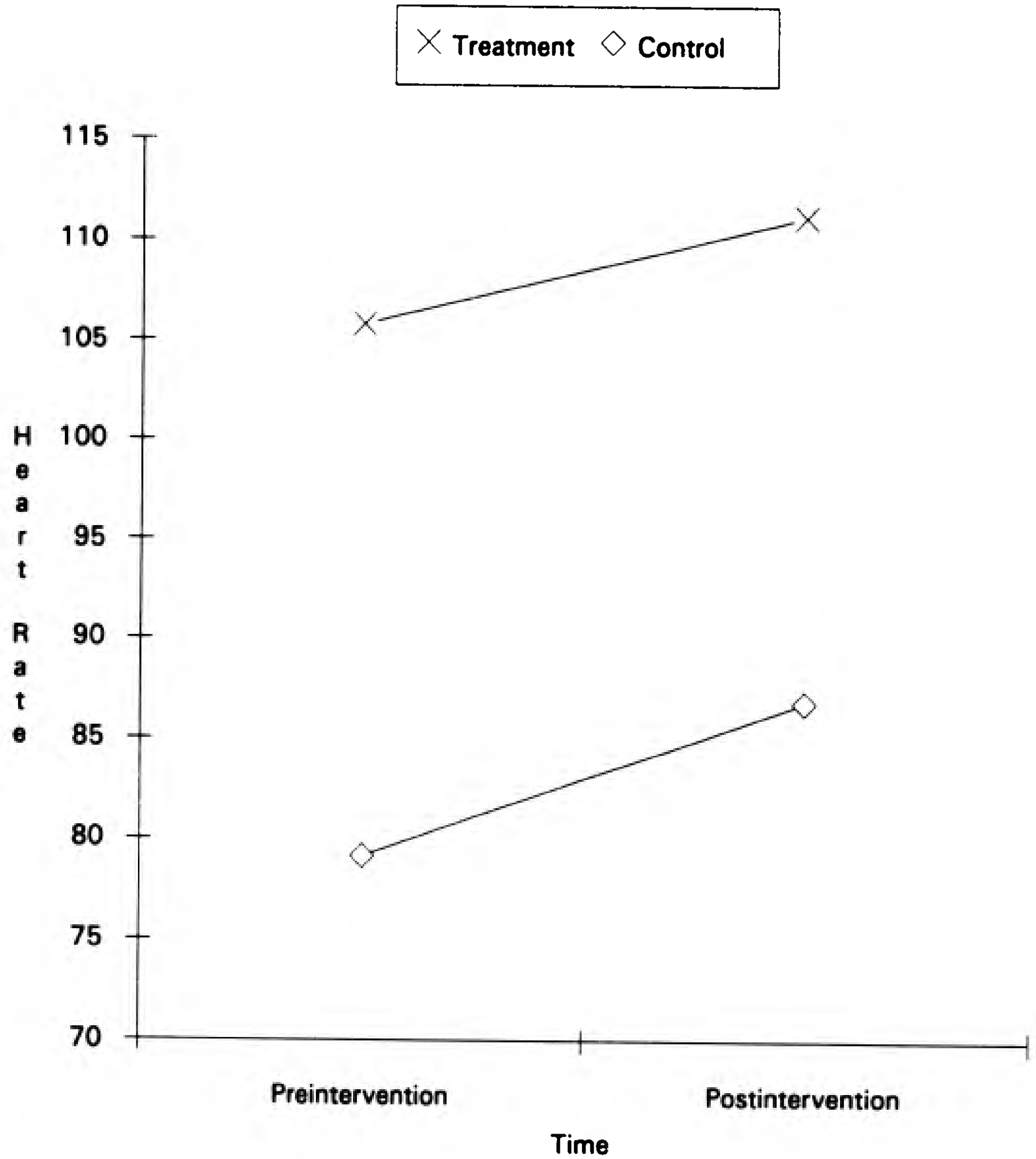

Figure 2. Comparison of mean heart rate between groups.

demonstrated change in a downward direction (decrease in rate), whereas the audiotaped pink noise group had an upward change (increase) in rate (see Figure 3). Mean scores of mean arterial blood pressure indicated a slight downward trend in the audiotaped imagery group and a slight upward trend in the pink noise group (see Figure 4). Examination of the ratio of respiratory frequency to tidal volume means demonstrate a slight upward change for the audiotaped imagery group, yet the audiotaped pink noise group had a strong upward direction in change (see Figure 5). However, the only statistical significance was in mean changes of oxygen saturation, $\underline{t}(4) = 3.74$, $\underline{p} = .020$, with an upward trend in the audiotaped imagery group and a downward trend in the audiotaped pink noise group (see Figure 6). This interactive effect indicated that as the mean oxygen saturation scores in the treatment group increased (improved), the mean scores in the control group decreased (declined).

Summary

This chapter contained the data analysis and research findings of the study. The chapter began with a description of the sample. Next, each research question was listed and the statistical findings were presented. The last section of the chapter consisted of additional findings regarding direction of change and graphing of the data.

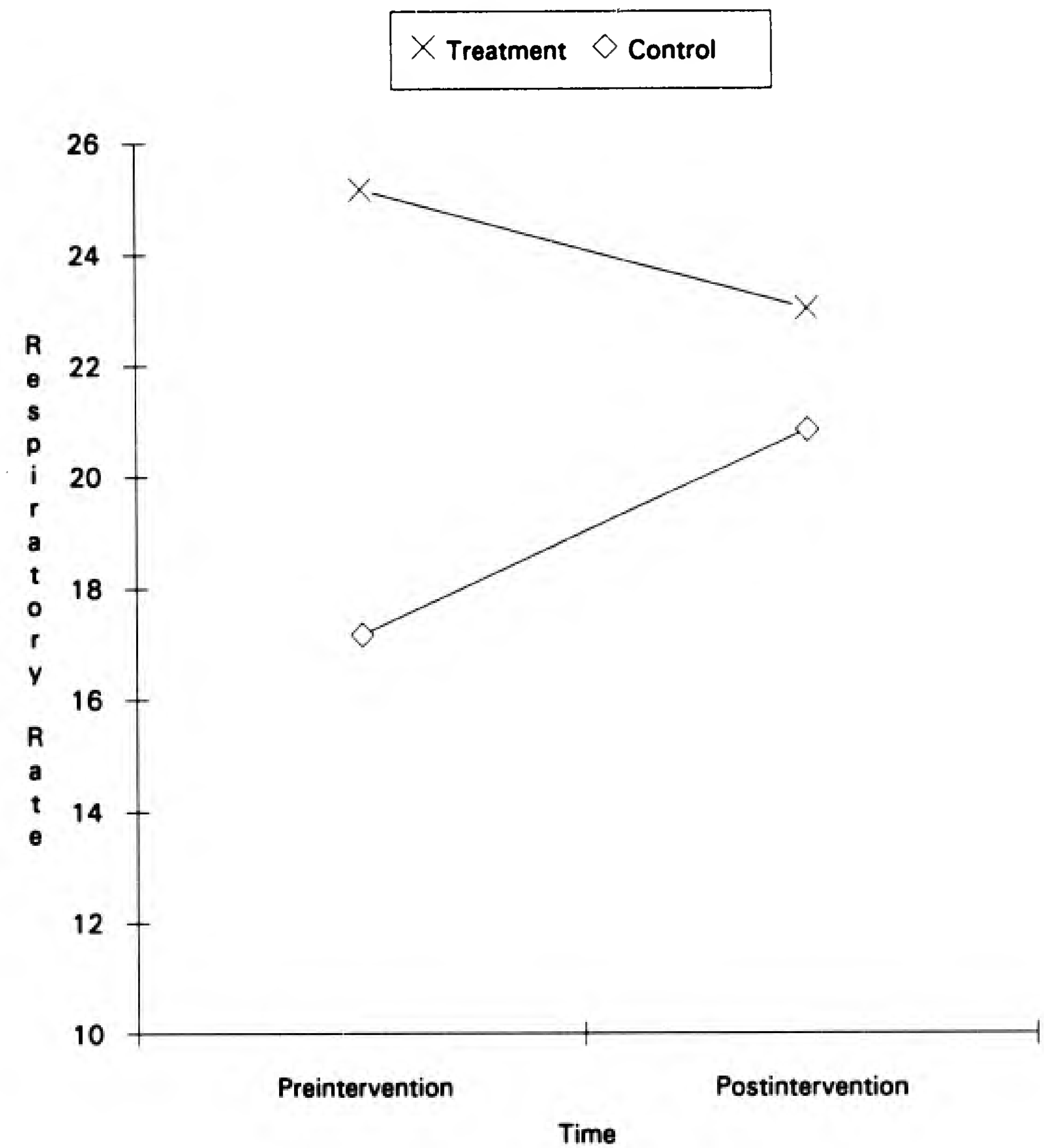

Figure 3. Comparison of mean respiratory rate between groups.

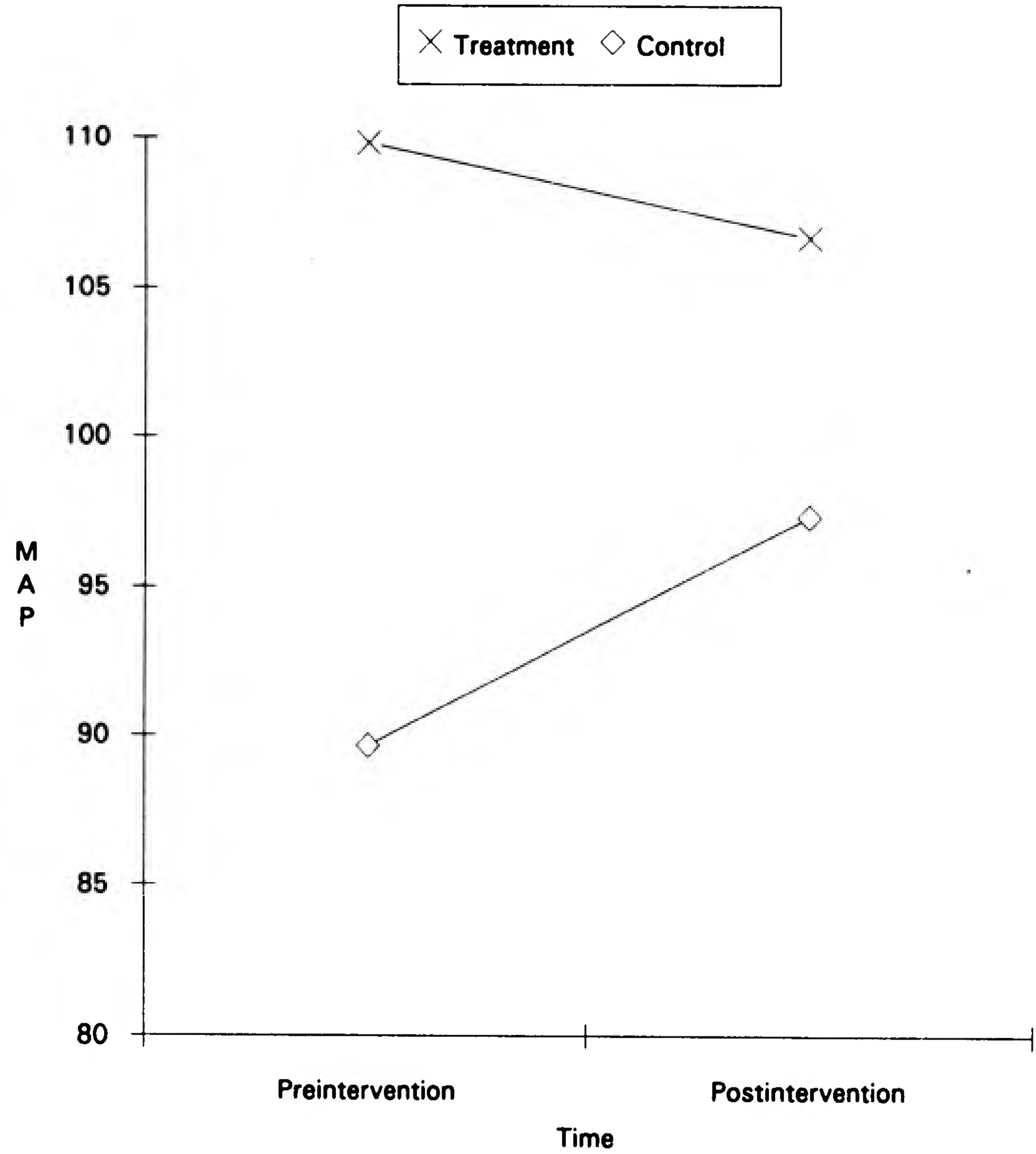

Figure 4. Comparison of mean arterial pressure between groups.

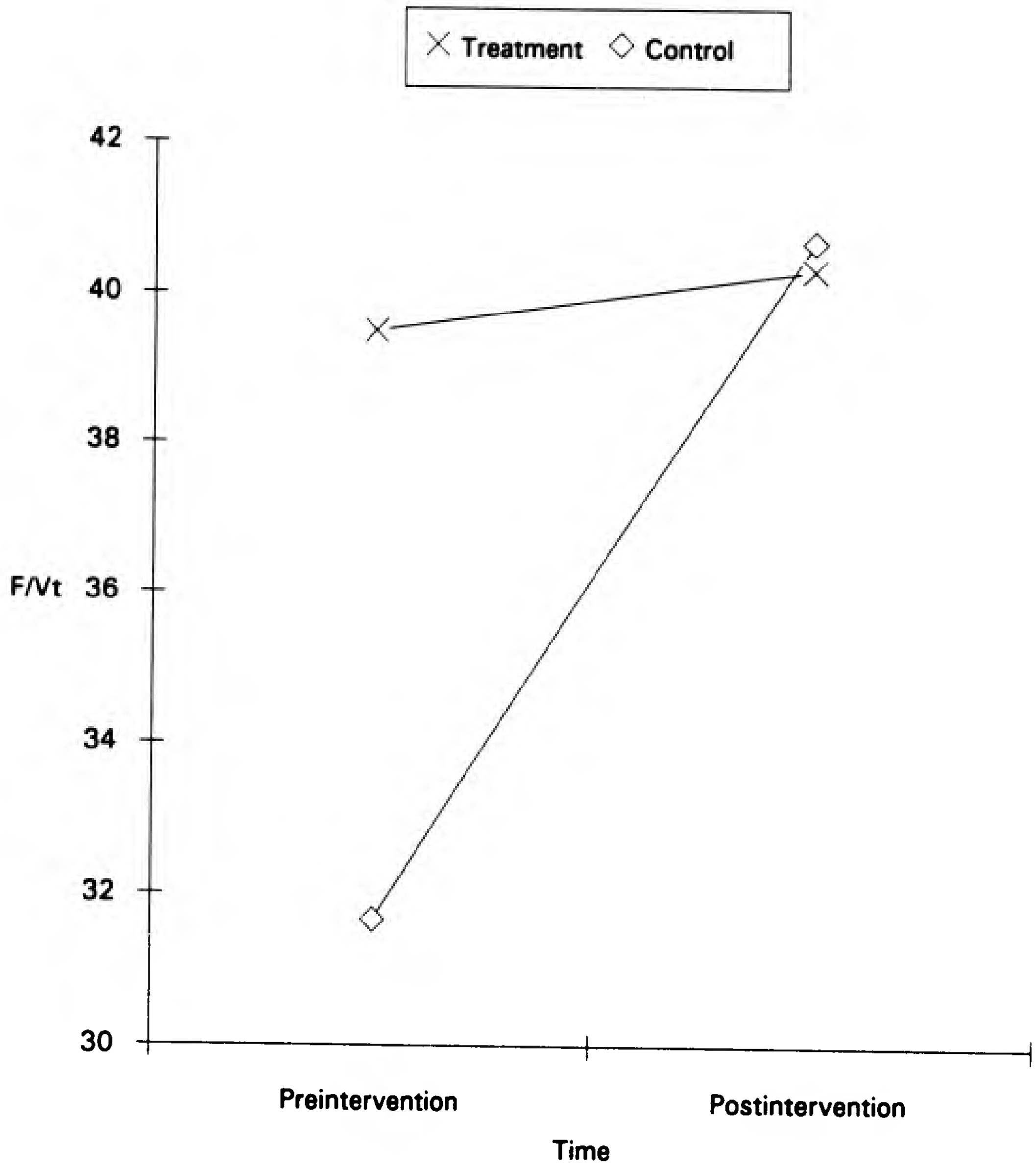

Figure 5. Comparison of the ratio of respiratory frequency to tidal volume between groups.

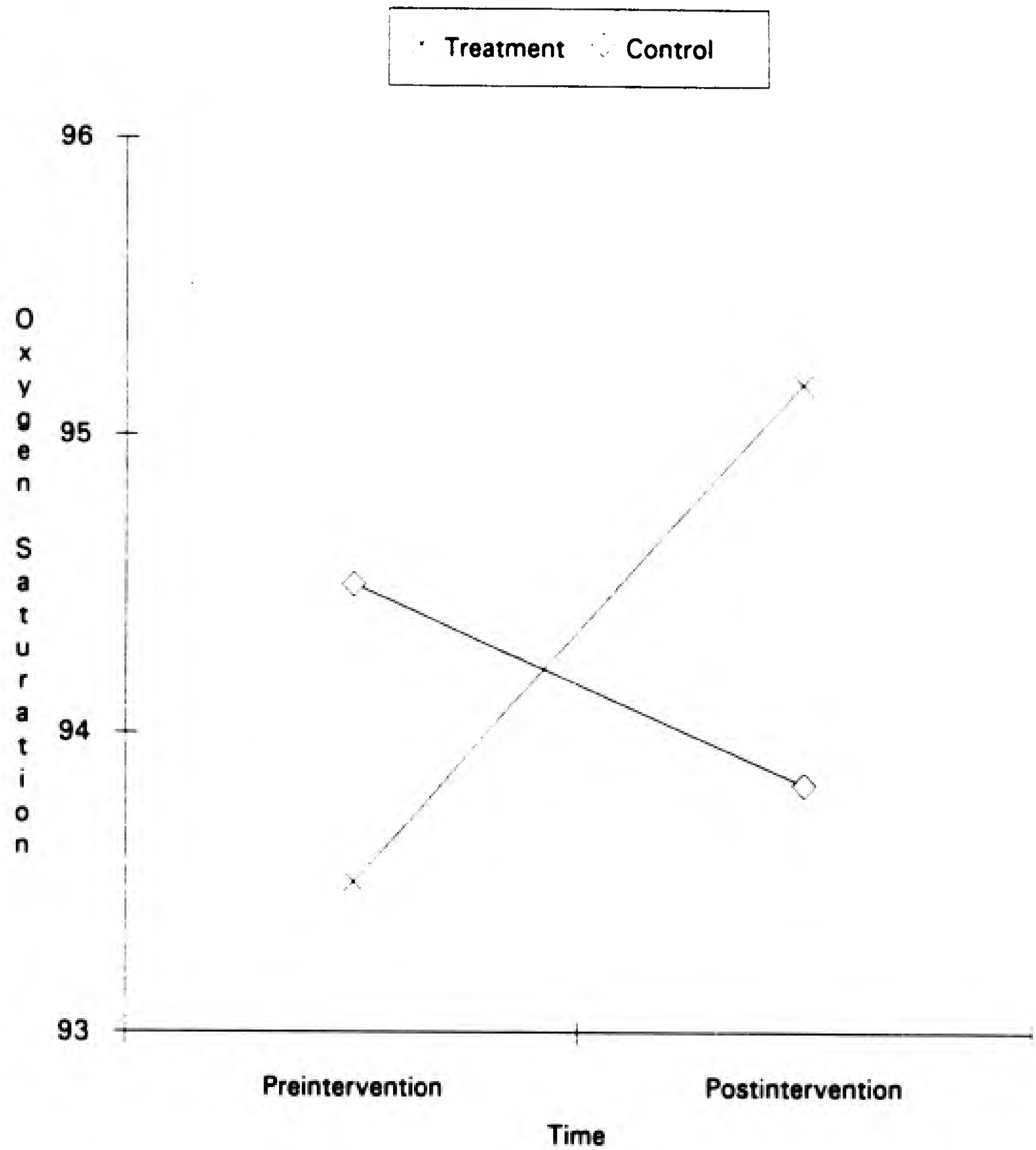

Figure 6. Comparison of oxygen saturation between groups.

CHAPTER 5

Discussion

Introduction

The purpose of this final chapter is to discuss the findings of the study and discuss possible applications of the study's findings to nursing practice. First, the chapter begins with an interpretation, or summary, of the results. The second section contains a discussion of the study's limitations. Recommendations for future research and implications for nursing practice comprise the final section of the chapter.

Interpretation of the Results

This study was designed to investigate the effects of audiotaped imagery on the weaning parameters of ventilated chronic obstructive pulmonary disease (COPD) patients. It was proposed that the use of imagery in COPD patients during the stressful period of weaning would provide a psychological means of producing physiologic relaxation. This proposition was based on the premise that alleviating psychological stressors during the weaning process decreases the physiologic demands placed on the patient, thereby promoting adaptation from dependent ventilation to independent respiration (Acosta, 1988; Grossbach-Landis, 1980; Henneman, 1989; Knebel, 1991). Physiologic manifestations of the relaxation response and indicators of weaning success used in this study to measure the effect of audiotaped imagery were changes in heart rate, respiratory rate, blood pressure, ratio of respiratory frequency to tidal volume, and oxygen saturation. Results of this study showed no statistically significant changes in the mean scores of the five parameters as a result of audiotaped imagery.

Although these findings were statistically non-significant, an interesting observation can be made when looking at the effect of audiotaped imagery on the standard deviations of mean scores for both respiratory rate and the ratio of respiratory frequency to tidal volume. For respiratory rate, the standard deviation in the audiotaped imagery group went from 12.3 preintervention to 2.6 postintervention. However, in the audiotaped pink noise group, the standard deviation decreased only slightly from 7.7 preintervention to 6.7 postintervention. With the ratio of respiratory frequency to tidal volume, standard deviations in the audiotaped imagery group went from 22.5 preintervention to 11.3 postintervention, a decrease of almost 50%. The converse of this was true in the audiotaped pink noise group where the standard deviations increased from 21.5 preintervention to 23.9 postintervention. These observations suggest that the variability in the audiotaped imagery group decreased after the intervention.

Data analyses via t tests for independent samples were done to compare the mean changes of the parameters between groups. This was to ascertain whether the mean changes between groups were significantly different, even though there was no statistically significant difference in the parameters before the intervention and after the intervention. Comparison of mean change between groups was not statistically significant for heart rate, $t(4) = -.22$, $p = .836$; respiratory rate, $t(4) = -.83$, $p = .453$; mean arterial blood pressure, $t(4) = -1.87$, $p = .134$; and respiratory frequency to tidal volume, $t(4) = -.61$, $p = .575$. However, comparison of the mean changes in oxygen saturations between groups was statistically significant, $t(4) = 3.74$, $p = .020$.

A similar study examining the effects of verbal interaction and hand holding on the stress response of subjects during the weaning process reported nonsignificant findings (Henneman, 1989). Henneman used an experimental design with the treatment group receiving verbal interaction and hand holding and the control group receiving no direct interaction while being weaned via t-piece for the first time. Data analysis revealed no significant differences in heart rate, mean arterial blood pressures or respiratory rates between the groups.

Several factors may have contributed to the nonsignificant findings of the current study. First, as with the study by Henneman (1989), the sample size was very limited at six subjects. This occurred for two reasons, restricted time for data collection and strict criteria for inclusion in the study. Had the sample size been larger, the interactive effect of respiratory rate, mean arterial blood pressure, the ratio of respiratory frequency to tidal volume, and oxygen saturation between the two groups could have been examined. In addition, a larger sample size may have resulted in statistically significant differences in mean scores of all five parameters. As a pilot study, these findings only suggest possible trends in the directions of change in mean parameter scores.

Another factor which may have affected the results of the study was the population chosen. COPD patients are predisposed to difficulties during weaning from mechanical ventilation due to limited functional capacity as a result of the pre-existing disease process (Conti et al., 1992; Henneman, 1991; Knebel, 1991; Lush, Janson-Bjerklie, Carrieri, & Lovejoy, 1988; Tobin & Dantzker, 1991). This limited functional capacity includes decreased lung compliance, increased airway resistance, and hypoxemia due to decreased perfusion capabilities in lung tissue (Tobin & Dantzker, 1991). These limitations may have been compounded by the existence of respiratory complications such as pneumonia and pneumonitis in five of the six subjects. Another functional limitation noted to cause difficulties with weaning is respiratory muscle atrophy due to prolonged mechanical ventilation (Shikora et al., 1990; Tobin & Dantzker, 1991). The six subjects in this sample had been mechanically ventilated from 3 to 9 days with a mean of 4.8 days. In addition to prolonged ventilation, poor nutritional status may have affected muscle atrophy and physical strength with the mean albumin level for the sample at 3.2 grams. Pre-albumin levels were found for only two of six subjects and were 10 grams and 26 grams. All of the above factors may have interplayed necessitating increased work of breathing in order for these COPD patients to compensate.

A third possible explanation of nonsignificant findings may be that changes in parameters as a result of audiotaped imagery might be very slight in these patients because of the physiologic limitations of the disease. Consequently, mean changes in parameters may never be statistically significant. Examining trends in the changes of parameter means and comparing these trends between groups may evidence this possibility. The trends as shown in Figures 2-6 are only suggestive of changes which may be found statistically significant in a larger sample.

The presence of medications in patients which may have altered their level of consciousness and/or effected changes in parameters is the fourth factor which may have impacted the effects of audiotaped imagery on this sample. Five of the six subjects had been given one or more of these medications within 12 hours of data collection. However, all of these subjects met the criteria for inclusion in that they were alert and able to follow simple commands. For the purposes of this study, eliminating potential subjects who had been given any type of medication which may have affected their level of consciousness or caused changes in their parameters within a certain time frame of data collection was not feasible. In similar studies investigating the use of alternative modes of relaxation in ventilated patients, the possibility of such medications altering the effects of the intervention was not discussed (Acosta, 1988; Henneman, 1989; LaRiccia et al., 1985).

A final factor which may have affected the results of the study is the design. Audiotaped imagery, as the method of intervention, was only given one time to each subject. Again, due to time constraints, the study did not allow for repeated intervention, and one session of audiotaped imagery may not have been adequate to effect change in the five parameters. Several authors state a greater effect is achieved with imagery if the process is practiced or rehearsed (Achterberg & Lawlis, 1882; Fezler, 1989; Korn & Johnson, 1983). This is supported by the findings of a study conducted by Wynd (1992b) examining the effects of imagery on smoking cessation. The findings related significant changes in variables over time with increased effectiveness of imagery, decreased stress, and more success with abstinence in the group receiving imagery training. Although a significantly different population was used in this study, the concept of practice or rehearsal with imagery effecting greater change may apply to any population.

Limitations

The primary limitation to this study was the small sample size of six subjects. As mentioned above, this occurred because of restricted time for data collection and strict criteria for inclusion in the study. In addition, many of the results of this study displayed large standard deviations, possibly due to the small sample size. For these reasons, the inferential power of the study's results are severely limited. However, lack of statistically significant findings in this study is not indicative that imagery has no effect on the stress response in mechanically ventilated COPD patients.

Another limitation of the study, also due to the small sample size was the inability to examine the effects of imagery on gender and age. With only six subjects randomly assigned to two groups, the audiotaped imagery group contained two females and one male, making statistical analysis of the effects on gender impossible. Determination of the effects on age were also not possible.

Recommendations and Implications

Several recommendations are proposed for further research based on the findings of the study. One of the most important is when designing future studies define a larger population to assure a larger, more adequate sample size. In addition, study a less complicated or less severely ill population, possibly using acutely ill mechanically ventilated patients rather than those with chronic illness, to begin looking at the effects of imagery on the weaning process. Further research could then be done which could expand to more complicated patient populations based on findings in the preliminary research.

Other recommendations including designing future studies to use repeated audiotaped imagery sessions with each subject. This repeated intervention design aids the researcher in obtaining and measuring the full effects or benefits of imagery. Another measure to strengthen the study would be to use more than two treatment conditions; for example, imagery, music, and pink noise.

An additional recommendation for future research, although not possible in this study, would be to examine how age and gender affect the response to imagery. No discussion was found in the literature or in current research regarding how the response to imagery might be affected by age and gender. With research presently focusing on gender differences and the current patient population having a large disparity of age, it is imperative that research examining patient treatment with non-traditional modes such as imagery also explore how age and gender affect patient responses.

The lack of significant findings in this study does not indicate that imagery has no effect on the stress response in mechanically ventilated COPD patients. It merely suggests that further research in this area is needed because the use of imagery has been found effective in altering the stress response in other patient populations (Heath, 1992; Holden-Lund, 1988; Stephens, 1992; Wynd, 1992a, 1992b). In addition to researching imagery and other alternative modes of treatment as to the effects on patients, it is important to educate nurses in the use of such alternative modes. Through education current researchers can communicate research findings to peers, as well as motivate other potential nurse researchers to pursue research in this area.

Summary

The purpose of this study was to determine the effects of audiotaped imagery on the weaning parameters of mechanically ventilated COPD patients. This chapter discussed an interpretation of the findings, the study's limitations, recommendations for further research, and implications for nursing practice. Although the results of the study indicated that imagery did not significantly affect the heart rate, respiratory rate, mean arterial blood pressure, ratio of respiratory frequency to tidal volume, and oxygen saturation in the given sample, comparison of the trended changes in these parameters between groups indicates that with a larger sample size, changes in parameters might demonstrate significance.

Even though changes in parameters were not seen in the sample, use of imagery in other patient populations has been shown to effect change in the stress response (Heath, 1992; Holden-Lund, 1988; Stephens, 1992; Wynd, 1992a, 1992b). Findings from this study must not dissuade nurses from using methods of psychophysiologic relaxation with critically ill patients. Only through the use and research of such methods can nurses continue to develop nursing interventions which assist patients in alleviating the harmful effects of the stress response thereby aiding patients to attain and maintain optimal levels of wellness.

REFERENCES

Achterberg, J. (1985). Imagery in healing: Shamanism and modern medicine. Boston: New Science Library.

Achterberg, J., & Lawlis, F. (1982). Imagery and health intervention. In B. Dossey & L. Dossey (Eds.), Topics in clinical nursing: Consciousness and health (Vol. 3(4) (pp. 55-60). Rockville, MD: Aspen.

Acosta, F. (1988). Biofeedback and progressive relaxation in weaning the anxious patient from the ventilator: A brief report. Heart & Lung, 17, 299-301.

Andreassi, J. L. (1989). Psychophysiology: Human behavior and physiological response (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Asterita, M. F. (1985). The physiology of stress. New York: Human Sciences Press.

Benson, H. (1975). The relaxation response. New York: William Morrow.

Benson, H. (1979). The mind/body effect: How behavioral medicine can show you the way to better health. New York: Simon and Schuster.

Bridges, E. J. (1992). Transition from ventilatory support: Knowing when the patient is ready to wean. Critical Care Nurse Quarterly, 15(1), 14-20.

Burney, M. A. (1992). King and Neuman: In search of the nursing paradigm. Journal of Advanced Nursing, 17, 601-603.

Burns, D. D. (1980). Feeling good: The new mood therapy. New York: Avon.

Cacioppo, J. T., & Tassinary, L. G. (1990). Psychophysiology and psychophysiological inference. In J. T. Cacioppo & L. G. Tassinary (Eds.), Principles of psychophysiology: Physical, social, and inferential elements (pp. 3-33). New York: Cambridge University Press.

Cohen, I. L., Bari, N., Strosberg, M. A., Weinberg, P. F., Wacksman, R. M., Millstein, B. H., & Fein, I. A. (1991). Reduction of duration and cost of mechanical ventilation in an intensive care unit by use of a ventilatory management team. Critical Care Medicine, 19, 1278-1284.

Conti, G., DeBlasi, R., Pelaia, P., Benito, S., Rocco, M., Massimo, A., Bufi, M., Mattia, C., & Gasparetto, A. (1992). Early prediction of successful weaning during pressure support ventilation in chronic obstructive pulmonary disease patients. Critical Care Medicine, 20, 366-371.

Corson, J. A., Grant, J. L., Moulton, D. P., Green, R. L., & Dunkel, P. T. (1979). Use of biofeedback in weaning paralyzed patients from respirators. Chest, 76, 543-545.

Dettenmeier, P. A. (1992). Pulmonary nursing care. St. Louis: Mosby-Year Book.

Fezler, W. (1989). Creative imagery: How to visualize in all five senses. New York: Simon & Schuster.

Fitzgerald, L. M., & Huber, G. L. (1976). Weaning the patient from mechanical ventilation. Heart & Lung, 5, 228-234.

Gift, A. G., & Cahill, C. A. (1990). Psychophysiologic aspects of dyspnea in chronic obstructive pulmonary disease: A pilot study. Heart & Lung, 19, 252-257.

Gift, A. G., Moore, T., & Soeken, K. (1992). Relaxation to reduce dyspnea and anxiety in COPD patients. Nursing Research, 41, 242-246.

Gift, A. G., Plaut, M., & Jacox, A. (1986). Psychologic and physiologic factors related to dyspnea in subjects with chronic pulmonary disease. Heart & Lung, 15, 595-601.

Grossbach-Landis, I. (1980). Successful weaning of ventilator-dependent patients. In A. M. Stein & M. F. Fuhs (Eds.), Topics in clinical nursing: Breathing and breathlessness, (Vol. 2, No. 3, pp. 45-65). Rockville, MD: Aspen.

Heath, A. H. (1992). Imagery: Helping ICU patients control pain and anxiety. Dimensions of Critical Care Nursing, 11(1), 57-62.

Henneman, E. A. (1989). Effect of nursing contact on the stress response of patients being weaned from mechanical ventilation. Heart & Lung, 18, 483-489.

Henneman, E. A. (1991). The art and science of weaning from mechanical ventilation. Focus on Critical Care, 18, 490-501.

Holden-Lund, C. (1988). Effects of relaxation with guided imagery on surgical stress and wound healing. Research in Nursing and Health, 11, 235-244.

Holliday, J. E., & Hyers, T. M. (1990). The reduction of weaning time from mechanical ventilation using tidal volume and relaxation biofeedback. American Review of Respiratory Disease, 141, 1214-1220.

King, J. V. (1988). A holistic technique to lower anxiety: Relaxation with guided imagery. Journal of Holistic Nursing, 6(1), 16-20.

Kline Leidy, N. (1989). A physiologic analysis of stress and chronic illness. Journal of Advanced Nursing, 14, 868-876.

Kline Leidy, N., Ozbolt, J. G., & Swain, M. A. P. (1990). Psychophysiologic processes of stress in chronic physical illness: A theoretical perspective. Journal of Advanced Nursing, 15, 478-486.

Knebel, A. R. (1991). Weaning from mechanical ventilation: Current controversies. Heart & Lung, 20, 321-331.

Korn, E. R., & Johnson, K. (1983). Visualization: The uses of imagery in the health professions. Homewood, IL: Dow Jones-Irwin.

Langner, S. R., & Innes, C. (1980). Breathing, holism, and health. In A. M. Stein & M. F. Fuhs (Eds.), Topics in clinical nursing: Breathing and breathlessness (Vol. 2, No. 3, pp. 1-10). Rockville, MD: Aspen.

LaRiccia, P. J., Katz, R. H., Peters, J. W., Atkinson, W., & Weiss, T. (1985). Biofeedback and hypnosis in weaning from mechanical ventilators. Chest, 87, 267-269.

Linn, L. J. (1979). Psychosocial needs of patients with acute respiratory failure. Critical Care Quarterly, 1, 65-73.

Lush, M. T., Janson-Bjerklie, S., Carrieri, V. K., & Lovejoy, N. (1988). Dyspnea in the ventilator-assisted patient. Heart & Lung, 17, 528-535.

Miller, K. M., & Perry, P. A. (1990). Relaxation technique and postoperative pain in patients undergoing cardiac surgery. Heart & Lung, 19, 136-146.

Nett, L. M., Morganroth, M. L., & Petty, T. L. (1987). Weaning: In specific clinical situations. American Journal of Nursing, 87, 1178-1180.

Neuman, B. (1980). The Betty Neuman Health-Care Systems Model: A total person approach to patient problems. In J. P. Reihl & C. Roy (Eds.), Conceptual models for nursing practice (2nd ed.) (pp. 119-134). New York: Appleton-Century-Crofts.

Neuman, B. (1982). The Neuman Health-Care Systems Model: A total approach to client care. In B. Neuman (Ed.), The Neuman Systems Model: Application to nursing education and practice (pp. 8-29). Norwalk, CT: Appleton-Century-Crofts.

Neuman, B. (1989). The Neuman Systems Model. In B. Neuman (Ed.), The Neuman Systems Model (2nd ed.) (pp. 3-47). Norwalk, CT: Appleton & Lange.

Nightingale, F. (1859). Notes on nursing. London: Harrison and Sons.

Perry, P. A. (1974). A perspective on chronic obstructive lung disease. In B. Bergerson (Ed.), Current concepts in nursing (4th ed.) (pp. 301-305). St. Louis: C. V. Mosby.

Ross, M. M., & Bourbonnais, F. F. (1985). The Betty Neuman Systems Model in nursing practice: A case study approach. Journal of Advanced Nursing, 10, 199-207.

Rotman, H. H. (1991). Acute exacerbation of chronic obstructive pulmonary disease. In D. R. Dantzker (Ed.). Cardiopulmonary critical care (pp. 809-824). Philadelphia: W. B. Saunders.

Sahn, S. A., Lakshminarayan, S., & Petty, T. L. (1976). Weaning from mechanical ventilation. Journal of the American Medical Association, 235, 2208-2212.

Selye, H. (1950). The physiology and pathology of exposure to stress. Montreal: Acta.

Selye, H. (1974). Stress without distress. Philadelphia: J. B. Lippincott.

Selye, H. (1978). The stress of life (revised ed.). New York: McGraw-Hill.

Shikora, S. ' , Bistrian, B. R., Borlase, B. C., Blackburn, G. L., Stone, M. D., & Benotti, P. N. (1990). Work of breathing: Reliable predictor of weaning and extubation. Critical Care Medicine, 18, 157-162.

Sodergren, K. M. (1985). Guided imagery. In M. S. Snyder (Ed.), Independent nursing interventions (pp. 103-124). New York: John Wiley & Sons.

Stephens, R. L. (1992). Imagery: A treatment for nursing student anxiety. Journal of Nursing Education, 31(7), 314-320.

Surwillo, W. W. (1986). Psychophysiology: Some simple concepts and models. Springfield, IL: Charles C Thomas.

Sutherland, J. E. (1991). The link between stress and illness: Do our coping methods influence our health? Stress and Illness, 89(1), 159-164.

Tache, J., & Selye, H. (1985). On stress and coping mechanisms. Issues in Mental Health Nursing, 7, 3-24.

Tobin, M. J., & Dantzker, D. R. (1991). Mechanical ventilation and weaning. In D. R. Dantzker (Ed.). Cardiopulmonary critical care (pp. 259-308). Philadelphia: W. B. Saunders.

Vines, S. W. (1988). The therapeutics of guided imagery. Holistic Nursing Practice, 2(3), 34-44.

White, J. M. (1992). Music therapy: An intervention to reduce anxiety in the myocardial infarction patient. Clinical Nurse Specialist, 6(2), 58-63.

Wynd, C. A. (1992a). Personal power imagery and relaxation techniques used in smoking cessation programs. American Journal of Health Promotion, 6(3), 184-189.

Wynd, C. A. (1992b). Relaxation imagery used for stress reduction in the prevention of smoking relapse. Journal of Advanced Nursing, 17, 294-302.

Yang, K. L., & Tobin, M. J. (1991). A prospective study of indexes predicting the outcome of trials of weaning from mechanical ventilation. The New England Journal of Medicine, 324, 1445-1450.

APPENDIX A

Intervention

INTERVENTION

Meadow Scene

Soft guitar music (00:30).

"Get into a comfortable position with your head, hands and feet supported. . . . Close your eyes. . . . Take a breath inhaling slowly and deeply. . . . Let the breath out slowly, feeling all tension and tightness escape from your body with the breath. . . . Breathing is so easy. . . . Take another deep breath. . . . Let it go . . . allowing your body to become relaxed. . . . Your hands feel warm. . . . Breathing is so easy. . . . Allow your body to become limp like a rag doll. . . . Continue with slow even breaths . . . feeling your body become more comfortable. . . . Your hands feel warm. . . . You are very comfortable. . . . There is nothing you need to worry about right now. . . . You feel at peace with the world. . . . Now, letting your body stay relaxed . . . you're going to explore a meadow. . . . In your mind . . . picture yourself standing on a low rise, looking into a meadow. . . . It's a warm spring day. . . . You feel a gentle, warm breeze on your arms. . . . There is a large maple tree just ahead of you with a small brook running beside it. . . . Slowly walk to the tree. . . . Just at the edge of the stream is a large smooth rock. . . . Sit down comfortably either on the rock or next to it on the grass and lean against it. . . . Listen to the ripple of the brook as it gently passes by on its way. . . . A meadowlark is singing cheerfully in the tree. . . . Enjoy the warm breeze . . . the ripple of the brook . . . and the cheerful song of the meadowlark for a little while. . . ." (02:33)

Meadowlark singing and brook rippling (10:08). . . .

"It is time for you to return. . . . You may return to the meadow whenever you choose simply by remembering how it looked and felt. . . . As I count from ten to one, you will become alert. . . . On five you will open your eyes. . . . On one, you will be fully alert. . . stretch easily and feel refreshed. . . . Ten . . . Nine . . . Eight . . . Seven . . . Six . . . Five, open your eyes. . . . Four . . . Three . . . Two . . . One, you are alert. . . . Stretch easily." (00:50).

Soft guitar music (00:30). (Total elapsed time is 14:51).

<u>Pink Noise</u>

"You will lie quietly with your eyes closed until instructed to open them at the end of the tape." (00:24).

White noise (14:23).

"You may open your eyes now." (00:04). (Total elapsed time is 15:17).

Dialogue for the Meadow Scene and Pink Noise audiotapes developed by Adria Heath, RN, MSN.

APPENDIX B

Demographic Data Sheet

DEMOGRAPHIC DATA SHEET

Subject Code _____Treatment ____ or Control ____

Age: _____ Gender: M F Days on ventilator: _____

Height: _____ Weight: _____

Previous episodes of mechanical ventilation? yes no

If yes, how many times? _____

Reason for hospitalization?

Acute exacerbation of COPD _____
Superimposed respiratory complication _____
Cardiac complication _____
Other:

Other disease processes present in patient?

Coronary artery disease ____
Congestive heart failure ____
Hypertension ____
Cor pulmonale ____
Other:

Diabetes mellitus ____
Kidney failure ____
Pneumonia ____

Medications taken within the last 12 hours (other than anxiolytics):

name amount last taken frequency

Anxiolytics:

name amount last taken frequency

Albumin level: Pre-albumin level:

APPENDIX C

Weaning Parameter Flow Sheet

WEANING PARAMETER FLOW SHEET

Subject Code _____ Treatment ____ or Control ____

Pre-intervention:

	Time	HR	MAP	RR	f/V_t	SaO_2
(1)						
(2)						

Intervention:

Start time: Stop time:

Post-intervention:

	Time	HR	MAP	RR	f/V_t	SaO_2
(1)						
(2)						

Have you had any previous experience with imagery? yes no

Interruptions during intervention and post-thirty minute period?

If intervention stopped before completion, explain reason.

APPENDIX D

Verbal Script

VERBAL SCRIPT

Hello, I am Beth Kohsin, RN, BSN, a critical care nurse and graduate student in the master's degree program at Arizona State University, College of Nursing. I am conducting research as partial fulfillment of a master's degree. I would like to know if you would be interested in participating in a project studying the influence of listening to an audiotape while you are still on the mechanical ventilator.

The procedure is very simple. If you choose to participate, you will be asked to listen to an audiotape. To start, I will collect some information from your medical chart and record some numbers from the ventilator. I will record the numbers again in 30 minutes. Then, you will listen to a 15 minute audiotape. After the 15 minutes is up, I will again record some numbers from the ventilator, wait 30 minutes and record the numbers again. The total amount of time required if you agree to participate is approximately 30 minutes.

Participation is voluntary and will in no way change or alter your current treatment. In addition, no costs will be added to your hospital bill for participating in the study. If you decide to participate, you must sign an informed consent stating you have agreed to participate in the study.

There are no risks or discomforts associated with participation in this study. In addition, you may withdraw from the project at any time without penalty, and withdrawal will not affect your care in any way.

APPENDIX E

Consent Letter

CONSENT LETTER

(Medical Center Name)

IMAGERY AS A MEANS OF IMPROVING WEANING PARAMETERS IN COPD PATIENTS

Dear Participant:

I, Beth Kohsin, R.N., B.S.N., am a graduate student under the direction of Dr. Shirley Bell in the College of Nursing at Arizona State University, and I am conducting a research study.

<u>PURPOSE OF THE STUDY</u>. The purpose of this research study is to examine the influence of an audiotape of soft noise on patients who are on a mechanical ventilator.

<u>INVITATION TO PARTICIPATE</u>. You are invited to participate in this study because you are an adult with chronic lung disease and are on a mechanical ventilator.

<u>EXPLANATION OF PROCEDURES</u>. This is an experimental study in which you will be randomly selected (by a random numbers table) for one of two groups. Each group will listen to a different audiotape of soft noise. The procedure is simple. Prior to listening to the audiotape of soft noise, I will collect some information from your medical chart which includes your age, gender, height, weight, number of days you have been on the ventilator, why you were admitted to the hospital, what illnesses you have, what medications you are taking, and what your albumin level is. Then, I will place a small probe on your finger, which is attached to a pulse oximeter. I will record some numbers from the ventilator and pulse oximeter and take your blood pressure, and repeat them in 30 minutes. You will then listen to a 15 minute audiotape of soft noise. After the 15 minutes of listening to the tape, I will record some numbers from the ventilator and pulse oximeter and take your blood pressure, and repeat them in 30 minutes. After the last set of numbers have been recorded, the pulse oximeter will be removed. The person performing the procedure will be either Beth Kohsin, R.N., B.S.N. or Debra Bergstrom, R.N., M.S., C.C.R.N. The study will be conducted in your room and your participation will involve approximately 30 minutes of your time.

<u>RISKS AND DISCOMFORTS</u>. There are no foreseeable risks or discomforts associated with participation in the study.

BENEFITS. Although there may be no direct benefit to you, the possible benefit of your participation is contributing to knowledge that may help future patients on ventilators.

ALTERNATIVES. There are no alternatives to treatment if you do not choose to participate in this study. Also, if you choose not to participate or if you withdraw from the study at any time, your current treatment will not be affected or altered in any way

FINANCIAL OBLIGATIONS. No costs will be added to your bill for participating in the study.

FINANCIAL COMPENSATIONS. You will not be compensated for your participation in the study.

CONFIDENTIALITY. In order to maintain confidentiality of your records, I will not record or use your name with any of the collected information. Instead, a subject code will be assigned to the data collection sheets and will be the only means of identification for the purposes of the study. At the completion of the study, the subject codes will be removed from the data sheets. In addition, results of the study will be reported in composite form. The only persons with access to the information collected and recorded on the data sheets will be me and three other primary persons involved in this study. The information will be secured in the official files maintained by Shirley Bell, R.N., Ed.D., Assistant Professor, College of Nursing, Arizona State University. The results of the research study may be published, but your name or identity will not be revealed.

ADDITIONAL INFORMATION. If any significant findings develop during the procedure that may relate to your willingness to participate, the researcher will inform you at that time.

IN CASE OF INJURY COMPENSATION. (Medical Center Name) will provide first-aid treatment in the event of injury resulting from research procedures. Any medical treatment will be the financial responsibility of the research participant. (Medical Center Name) does not provide compensation to a person who is injured while participating as a subject in research. This does not waive your rights in the event of negligence.

VOLUNTARY PARTICIPATION. Your participation in the study is voluntary. You may refuse to participate in the study and you are also free to withdraw from the study at any time. Neither of these actions will prejudice your physicians against you in any way.

WITHDRAWAL FROM THE STUDY. For your safety, your participation may be terminated by your physician at any time without your consent.

OFFER TO ANSWER QUESTIONS. If you have any questions concerning the research study, please do not hesitate to ask. If you think of questions later, please feel free to call me at (602) 965-3244 or Dr. Bell at (602) 543-6605.

VOLUNTARY STATEMENT. You are voluntarily making a decision whether or not to participate in the research study described above. Your signature indicates that you have decided to participate having read the information provided above. You will be given a copy of this consent form to keep.

I give my consent to participate in the above study and give permission to Beth Kohsin, R.N., B.S.N., to access my hospital records.

______________________________ ________________
Signature of Subject Date

______________________________ ________________
Signature of Investigator Date

______________________________ ________________
Signature of Witness Date

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through Carol Jablonski, at (602) 965-6788.