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ANXIETY AND ANXIETY ASSESSMENT OUTCOMES IN MECHANICAL VENTILATED PATIENTS: CONCEPTS ANALYSIS

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ABSTRACT

Anxiety is common problem in patients with mechanical ventilation. Anxiety is also difficult to assess, because patients cannot talk, sensation of dyspnea, immobility, and some of the patients is running low of consciousness. Anxiety in patients with mechanical ventilated patients can impact the physiological responses and psychological responses. Anxiety can increases the sympathetic nervous system, influence the regulation system of body vital sign, fear, and feeling lonely. Nurse need to know the anxiety perspective and anxiety assessment to give the accuracy nursing intervention.

Keywords: *Anxiety, Assessment of Anxiety, Mechanical Ventilated Patients*

BACKGROUND AND SIGNIFICANCE OF THE PROBLEM

Mechanical ventilation is a life-saving treatment for patients with respiratory failure. Although ventilator support saves lives, it can also cause many negative physiological and psychological impacts on patients. Such physiological impacts include breathlessness, sleeplessness, immobility, restlessness, inability to talk, and the need for frequent suctioning. Anxiety is the most common psychological impact that ventilator support has on patients *(Chlan, 2003; Seaward, 2002)*. Anxiety increases sympathetic nervous system stimulation, breathing difficulty, oxygen demand, and myocardial stimulation, all of which contribute to high levels of anxiety *(Chlan, 1998)*. Patients using mechanically-ventilated support systems often experience adverse events due to this anxiety, such as constriction of arteries and airways in the lungs *(Mark B. Yagan, White, & Staab, 2002)*.

ANXIETY IN MECHANICAL VENTILATED PATIENTS

Theories and Definition of Anxiety

There are three main theories that explain the causes of anxiety. These theories are psychoanalysis theory, behavioral theory, and biological theory *(Sadock & Sadock, 2003)*. The theories explain that anxiety comes from exposure to external unsympathetic energy. People then seek to take advantage of the anxiety response in penetrating the conflict rather than accepting it. As a result, anxiety affects normal physical and mental conditions and this leads to behavioral and emotional abnormalities.

1. Psychoanalytical Theory

Sigmund Freud explained that anxiety is a sign of the perception of risk from the unconscious status *(Sadock & Sadock, 2003)*. This, according to the theory, owes to the psychological conflict of unconscious sexual or aggressive desires and the threat of superego or external reality. The signs of anxiety emerge from the ego using psychological protective mechanisms to prevent undesired thinking or feeling, which is expressed as consciousness. Anxiety may derive from an individual perception. A person believes that he or she is in danger of an external harsh force and seeks to exploit the anxiety response by penetrating the conflict rather than ignoring it.

2. Behavioral Theory

Behavioral theory states that the response of a person to anxiety depends on a particular stimulus. This theory proposes that anxiety comes from an assessment of the environment, where conditions are deemed to be unsafe and violent beyond what one can tolerate. It affects the normal physical and mental condition and this leads to behavioral and emotional abnormalities. Existentially, this theory explains that anxiety occurs because the person regards life as meaningless and suffers from having to live with this perception of reality. Hence, the person suffers from anxiety.

3. Biological Theory

Biological theory was developed from clinical studies on experimental animals suffering from induced anxiety. This theory states that biological changes cause anxiety, or that anxiety causes biological changes. It

emphasizes individual responses and sensitivity to biological responses.

The term "anxiety" comes from the Greek word agon, and is derived from the modern words anguish and agony. In German, agon is used for describing painful feelings of terror and dread *(Grimm, 1997; Hooi, 2007)*. In Latin, Agon has a similar meaning: narrow or shrunken and causing discomfort. The definition also includes a feeling of restlessness and worry towards uncertain situations. Sometimes it refers to fear of consequences. People feel impatient, oppressed, fearful, and/or frightened about the unknown, and possibly uncertain or unsure about the future *(Glas, 2003)*.

Anxiety is defined as a subjective experience of apprehension or tension, imposed by the expectation of danger or distress, necessitating the need for special action *(Kelly, 1980)*. Sir Aubrey Lewis as cited in *Kelly (1980)* in his classic paper, examined the problems presented by the word anxiety, as used in psychiatry. He discussed the usage of the word and its derivations and listed the characteristics of anxiety in the following categories:

1. It is an emotional state involving subjectively experienced qualities of fear or similar emotions (terror, alarm, fright, panic, dread).
2. The emotion is unpleasant. It may be a feeling of impending death or collapse. It is directed towards the future.
3. There are subjective bodily discomforts during the period of the anxiety: a sense of constriction in the chest, tightness in the throat, difficulty in breathing, and weakness in the legs.

There are several bodily disturbances which manifest during anxiety. Some of these are of functions normally under voluntary control, such as agitation, propensity to scream, and sudden defecation. Others are not under voluntary control, including dryness of the mouth, excessive sweating, tremors, the need to vomit, palpitations, and other physiological and biochemical functions that can be detected with appropriate methods of investigation.

The American Psychiatric Association (2000) defines anxiety as a response to life events, feelings of uncertainty, uneasiness, apprehension, or tension that a person experiences in response to an unknown object, situation, or danger, the source of which is largely unrecognized. Furthermore, *Spielberger and colleagues (1983)* separate anxiety into state anxiety and trait anxiety.

State anxiety is defined as an unpleasant emotion characterized by subjective feelings of tension, worry, and heightened autonomic activation of the nervous system. State anxiety is often transitory, and it can fluctuate and recur when appropriate stimuli evoke it *(Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)*.

People with both state and trait anxiety exhibit a general tendency to perceive and respond to threats in the environment. When a person is faced with stressful situations, trait anxiety causes him or her to perceive them as dangerous and threatening, and the person responds to them with an intense elevation of state anxiety. It endures over time and tends to be relatively stable and predictable. The stronger the trait anxiety, the more probable the individual will experience more intense and more frequent elevations of state anxiety in the threatening situation.

Several studies *(Chlan, 1998; 2003; Chlan, Engeland, Anthony, & Guttormson, 2007; Dahlen & Janson, 2002; Mok & Wong, 2003)* also defined anxiety as an emotional state involving subjective feelings of tension, apprehension, nervousness, and worry, and found these feelings to be associated with the sympathetic nervous arousal system. The physical manifestations of anxiety involve extreme shifts in body temperature, urinary urgency, mouth dryness, pupil dilation, appetite loss, and diaphoresis. Thus, anxiety is the emotion and feeling that occurs when an individual faces a stressful situation. The individual will assess the situation as unsafe, dangerous, and insecure. She or he will take steps to protect herself or himself from the perceived danger. This assessment depends on individual beliefs, thinking processes, perceptions, and past experiences. Once a person falls into this situation, she or he will respond physically (shaking, sweating, etc.), mentally (irritability, aggression, restlessness, etc.) and socially (fretfulness, stupefaction, etc.).

PATHOPHYSIOLOGY OF ANXIETY

Anxiety reactions increase the secretion of adrenalin. There are three important facts that cause adrenalin to increase: 1) the adrenal medulla is linked to the sympathetic nervous system, 2) many physiological changes are known to complement emotional arousal (e.g., tachycardia, pupil dilatation, and signs of increased sympathetic nervous system activity), and 3) the adrenal

glands share in widespread subjugation of the viscera to sympathetic control *(Kelly, 1980)*.

Anxiety is correlated with adrenaline and noradrenaline excretion. A significant correlation between anxiety and adrenaline, and between aggressiveness and noradrenaline excretion, has been found in various types of psychiatric and medical patients *(Cohen et al; Silverman et al., as cited in Kelly, 1980)*. In addition, anxiety can increase catecholamine production in response to the intensity of the psychological stimulus *(Euler as cited in Kelly, 1980)*. The medulla of the adrenal gland produces nearly all of the adrenaline in the body, excluding only some of the noradrenaline and venous blood, leaving it catecholamine. The proportion between them is 80% adrenaline and 20% noradrenaline *(Kelly, 1980)*. Adrenaline has both alpha and beta effects and causes an increase in heart rate and rise in systolic blood pressure, while diastolic blood pressure is unaltered or may even fall. Noradrenaline consists of almost pure alpha activity and causes a decrease in heart rate and rise in both systolic and diastolic blood pressure, due to constriction in the arterioles *(Guyton, 1991; Kelly, 1980)*.

Moreover, anxiety can produce hyperventilation, involving shallow breathing, disorganized respiratory rhythms, and a sensation of breathlessness. Patients reporting shocking sensations and other breathing problems during anxiety are a common clinical experience. There has been sustained interest among researchers regarding a possible link between the malfunction of the respiratory system and anxiety *(Griez & Perna, 2003)*.

CAUSES OF ANXIETY IN MECHANICAL VENTILATED PATIENTS

Anxiety is a common phenomenon in mechanical ventilated patients. A common cause of anxiety in mechanical ventilated patients is the sense of a communication barrier *(Alasad & Ahmad, 2004)*. *Rotondi and colleagues (2002)* studied 150 patients who received ventilator support for more than 48 hours. The researchers found that many of the patients did not remember the experience, but for those who did, they recalled that they were thirsty, felt tense and out of control, had difficulty swallowing and speaking, felt lonely, and experienced nightmares. Existing studies report that the causes of anxiety in mechanical ventilated patients consist of three stressors. They are as follows: (1) psychological stressors, (2) treatment stressors, and (3) environmental stressors.

Psychological Stressors

Recently, some studies described varied stressors that manifest in mechanical ventilated patients. These included sleep deprivation, nightmares, feelings of bewilderment, loneliness, and high levels of fear and anxiety that bring on attacks of terror and panic. In addition, patients also reported submission to caregivers, relatives' distress, depersonalization, and insecurity as factors leading to anxiety, and even agony *(Lusk & Lash, 2005; Rotondi et al., 2002)*.

Obviously, in mechanical ventilated patients are unable to communicate verbally. They often reported that they experienced psychological distress during treatment, including anxiety and fear. The sensation of breathlessness, frequent suctioning, inability to talk, uncertainty regarding surroundings, isolation from others, and general fear contributed to their high levels of anxiety *(Bunt as cited in Chlan & Tracy, 1999; Dileo, Bradt, & Grocke, 2008; McKinley, Stein-Parbury, & Chehelnabi, 2004)*. Dependence on ventilator support to breathe and the inability to speak can bring on anxiety, which can result in sleep disturbances, increased myocardial oxygen consumption, and increased sympathetic output. Increased sympathetic output can lead to tachypnea, tachycardia, and hypertension, and it makes the process of weaning a patient off ventilator support equipment more difficult. The patients' inability to speak may also make it harder for nurses to meet their needs *(Lindgren & Ames, 2005)*. They may have co-existing disorientation or suffer from drug effects, which make clear communication difficult. Furthermore, the physical manifestations of many disease states can mimic anxious behavior. In addition, lack of information, depersonalized care, and lack of sleep and rest were associated with fear, anxiety, and vulnerability.

Treatment Stressors

In Mechanical Ventilated Patients are often unable to express their needs, or even synchronize their own breathing *(Lusk & Lash, 2005)*. Tubes in the mouth or nose have been frequently cited as one of the strongest causes of anxiety, followed by the immobility caused by tube placement. Other treatment stressors highly ranked by these patients include suctioning, pain, and thirst *(Van de Leur, Zwaveling, Loef, & Van der Schans, 2003)*. Pain, inability to sleep, the presence of tubes in the nose or mouth, lack of self-control, and the presence of restraints were the top five treatment

stressors in patients *(Lusk & Lash, 2005)*.

Environmental Stressors

Environmental stressors encompass unfamiliar surroundings and people in an intensive care unit, the constant activity in such a unit, and also the multitude of other bothersome sights and sensations that are usually present. For example, stressors might include odd machinery with repetitious droning, disturbing alarms, loud noises, unpleasant odors, unpleasant sights and sounds, and continuous bright light, causing interruption of the circadian rhythm *(Bennum, 2001; Lusk & Lash, 2005)*. Other investigators documented that anxiety was caused by hearing nearby caregivers talk and laugh with seemingly no concern for the patient *(Jastremski, 2000; Thomas, 2003)*. However, problems caused by noise, unpleasant sounds, and machinery alarms might be unavoidable in many ICUs.

LEVEL OF ANXIETY IN MECHANICAL VENTILATED PATIENTS

The degree and duration of anxiety in mechanical ventilated patients, as demonstrated by each individual, varies depending on the individual's specific situation and personal characteristics *(Moser et al., 2003; Sungkhaw, 2001)*. Anxiety is categorized into four levels of intensity: mild anxiety, moderate anxiety, severe anxiety, and panic anxiety *(Shives, 2005)*.

1. Mild anxiety is associated with the tension of day-to-day living. During this stage the patient is alert and his or her perceptual field is increased. He or she can see, hear, and grasp more than previously. The patient can creatively cope with anxiety.
2. With moderate anxiety, a person focuses only on immediate concerns. The person blocks out selected areas but can continue to problem solve. Some symptoms, such as headaches, strong breathing, and eating disorders are present due to the anxiety.
3. In severe anxiety, a patient experiences significant reduction in the perceptual field, disorientation, lack of awareness of the environment, and inability to focus on what is really happening. A patient will feel physically and psychologically uneasy and will make attempts to reduce anxiety.
4. In panic anxiety, a person suffers loss of control, and is unable to do things with any sort of purpose. There is increased motor activity, decreased ability to relate to others, and distorted perceptions. The person is in a state of panic, and is unable to communicate or function effectively.

When in mechanical ventilated patients suffer anxiety, the levels usually range from moderate to severe *(Chlan, 2003; Wong et al., 2001)*. Wong and colleagues used music as an intervention in a study on mechanically ventilated patients with primarily respiratory medical diagnoses. Each day, the patients listened, in random order, to 30 continuous minutes of music, and were then provided 30 uninterrupted minutes of rest as a control. The Chinese version of Spielberger's State-Trait Anxiety Inventory (STAI) was used to assess anxiety before and after each intervention. Assessed physiologic variables included mean blood pressure and respiratory rates. The reported results of the study included a significant decrease in STAI scores after both interventions. However, music, with a reported mean STAI score difference of 14 points, was more effective than the control intervention of rest, with a reported 3.84 point mean STAI score difference. Although the physiologic variables of respiratory rate and mean blood pressure significantly decreased after both interventions, the results were not clinically significant. Overall, music may have a calming effect on mechanically ventilated patients and may assist in decreasing stressors.

Anxiety in mechanical ventilated patients is classified in terms of state and trait anxiety. State anxiety is conceptualized as a transitory emotional state or condition of the human organism that is characterized by subjective. It causes feelings of tension and apprehension, and results in the activation of the autonomic nervous system. State anxiety may vary in intensity and fluctuate over time. Trait anxiety refers to relatively stable individual differences in anxiety proneness. It is the difference between people with a tendency to perceive stressful situations as dangerous or threatening and those who respond to such situations with elevations in the intensity of their state anxiety reactions *(Spielberger et al., 1983)*.

State anxiety in mechanical ventilated patients reflects their environment over shorter periods of time and from situation to situation. State anxiety may be caused by the environment of an intensive care unit, with its highly technological machines and monitoring devices *(M. B. Yagan, White, & Staab, 2000)*. Therefore, such patients may feel higher anxiety compared to patients not on ventilator support. In contrast, trait anxiety in mechanical ventilated patients is individually-based, and is not dependent on specific behaviors to or responses in specific situations. In the ventilator support situation, patients will probably feel some anxiety regardless of other conditions.

Anxiety in mechanical ventilated patients generally is considered to be state anxiety. It is caused by responses to some threats related to the particular condition and treatment of the patient. Those patients manifest anxiety with feelings of tenseness and nervousness, and with restlessness or agitation. The complexity of patients' illnesses in relation to their medical conditions and the environment may result in diverse expressions of anxiety. Similarly, *Moser and colleagues (2003)*, in their study of anxiety assessment and management in critical care nursing, found that the physical manifestations of many disease states can mimic anxiety behaviors.

INFLUENCING FACTORS ON ANXIETY LEVEL IN MECHANICAL VENTILATED PATIENTS

There are a number of factors that contribute to anxiety in Mechanical Ventilated Patients. The results of some studies showed that factors contributing to anxiety mechanical ventilated patients include physical discomfort, unfamiliar environments, altered communication patterns, unfamiliar procedures, and uncertain outcomes. The degree of anxiety level exhibited by in Mechanical Ventilated Patients can depend on gender, age, need for ventilator support, length of time on ventilator support, and biological factors.

Sex

Sex has been revealed to have a connection with anxiety in several studies. *Mitchell (2003)* stated that anxiety was higher in female patients and novice patients. Female and novice patients were observed to experience greater anxiety than male patients, although they did not show significantly different levels. Obviously, gender cannot be changed. Women are somewhat more open emotionally than men. Even among women who face highly stressful situations in their lives, the risk of heart disease remains considerably lower than men. The bulk of research on psychological factors in heart disease has focused on men rather than women. Therefore, their physiological reactions to anxiety tend to be less intense *(Kelly, 1980)*.

In a different study on sex and anxiety in ventilated patients, *Chlan (2003)* found that the mean state anxiety score among female patients was 49.6 (SD = 13.2) with a range of state anxiety inventory scores from 22 to 78, while the mean state anxiety score in male patients was 48.7 (SD = 11.4) with a range in state anxiety inventory scores from 24 to 79. This indicates that the experience of receiving ventilator support resulted in moderate anxiety among both female and male patients. Thus, based on this study, it can be assumed that sex is not likely directly linked to anxiety in in Mechanical Ventilated Patients.

Age

Age differences have a profound effect on the management of anxiety in patients. Anxiety is most frequently experienced in children and elderly people. Among the causes of anxiety are fear of dependency, illness, and loss of friends and home. In elderly people, anxiety is associated with agitation, early dementia, chronic illness, and, ultimately, death *(Barnason, Zimmerman, & Nieveen, 1995)*.

Some studies have shown that age can influence anxiety in in Mechanical Ventilated Patients *(Dileo et al., 2008; McKinley, Stein-Parbury, Chehelnabi, & Lovas, 2004)*. The researchers found anxiety in not only young patients but also in middle-aged patients, particularly in females between 30 to 59 years of age who received ventilator support. They also found that elderly patients have higher anxiety scores than younger patients in intensive care who are receiving ventilator support

Indication of Using Ventilation Support

Ventilator support is a common method of respiratory support. It is used in patients with respiratory failure or those who require respiratory support during critical care. There are indications that ventilator support for patients creates state anxiety. In 2003, Chlan studied descriptions of anxiety levels by examining individual differences (n = 200) and found that the primary medical diagnosis categories were respiratory problems (n = 31%, mean anxiety = 50.5), abdominal or spinal surgery (13%, mean anxiety = 46.7), CABG or valve repair surgery (n = 41%, mean anxiety = 49.2), transplantation (n = 13.5%, mean anxiety = 48.0), and "other" medical diagnoses (n = 22%, mean anxiety = 49.5). The results indicated that patients who receive ventilator support primarily for respiratory problems may be more anxious than those with other medical problems on ventilator support (e.g., surgery cases, sepsis, myocardial infarction, congestive heart failure).

Another group of investigators studied 52 patients with chronic obstructive pulmonary disease who used ventilator support and who often experienced dyspnea and anxiety. The experimental group received daily acupressure therapy and massage treatment for 10 days. Patients in the comparison group received

massage treatment and handholding therapy. The primary outcome measures included the visual analogue scales for dyspnea and anxiety, and the physiological indicators of heart rate and respiratory rate. Data were collected every day: during the baselining process (day 1), during the treatment (days 2–10), and during follow-up (days 11–17). The results of the study found that levels of anxiety, as measured by the VAS (0–100) at the baseline, were measured at 70.73 (SD = 11.73) for the experimental group and 72.54 (SD = 11.73) for the comparison group, which indicated that patients using mechanical ventilation had high levels of perceived anxiety. There was no statistically significant difference between groups at the baseline ($t = 0.61$, $p = 0.54$). In the experimental group, anxiety levels gradually decreased from day 2 until day 12, but then gradually increased during the follow-up period (Shiow-Luan, Juei-Chin, Kuan-Chia, & Ue-Lin, 2005).

Patients' apprehension about their underlying health problems can also influence anxiety levels. Factors that may contribute to one's need for ventilator support usually involve major diseases of the respiratory tract, such as pneumonia, chronic obstructive pulmonary disease, and lung cancer *(Chlan, 2003)*. Furthermore, the physical manifestation of many disease states can mimic anxiety behaviors. Given these circumstances, it may be that in Mechanical Ventilated Patients manifest anxiety in widely diverse ways *(Moser et al., 2003)*.

Lengths of Ventilator Support

Regardless of the lengths of time patients receive ventilatory support, they generally report experiencing moderate anxiety, even after just six days *(Chlan, 2003)*, indicating that anxiety control requires continuous nursing attention regardless of the length of time a patient is on ventilator support. Chlan categorized the lengths of ventilator support treatment in that study as follows: less than 5 days, 6 to 21 days, 22 or more days, and chronic (receiving ventilation in place of residence before current hospitalization). Chlan, then, reported that patients receiving ventilator support for 22 or more days had to have the highest levels of anxiety. However, there is, in general, wide variability in the length of ventilator support time. Thus, higher levels of anxiety may be attributed to other factors, such as illness severity or weaning difficulty related to severe dyspnea. This requires further investigation.

Biological Factors

Patient responses to anxiety experiences during illness may have deleterious effects on the patients, potentially exacerbating pathological conditions and increasing the complexity of patient care. The underlying disease, hospitalization, and alteration in circadian rhythms can easily disrupt the lives of in Mechanical Ventilated Patients. Circadian rhythm refers to the biological cycles which last about 24 hours, or one day. Depending on the underlying disease, a patient's circadian rhythms can change *(Hartshorn, Lamborn, & Noll, 1993)*.

The Circadian Cycle is controlled by a region of the brain known as the hypothalamus, which is the master centre for integrating rhythmic information and establishing sleep patterns. Within the Circadian (24-hour) Cycle, a person usually sleeps approximately 8 hours and is awake 16 hours. During the wakeful hours, mental and physical functions are most active and tissue cell growth increases. During sleep, voluntary muscle activities nearly disappear and there is a decrease in metabolic rate, respiration, heart rate, body temperature, and blood pressure. The activity of the digestive system increases during the resting period, but that of the urinary system decreases. Hormones secreted by the body, such as the stimulant epinephrine (adrenaline), are released in maximal amounts about two hours before awakening so that the body is prepared for activity *(Paul & Lemmer, 2007)*.

Sleep in mechanical ventilated patients is greatly interrupted. Such patients have been noted to awaken frequently, have little to no REM (rapid eye movement) sleep, sleep for shorter periods, and rate their quality of sleep as poor *(Nancy, 2000)*. The impact of sleep disruption in in Mechanical Ventilated Patients is not fully known *(Norton, 2005)*. However, sleep inadequacy will impact physiological readiness for weaning off ventilator support *(Hampton, Griffith, & Howard, 2005)*. Therefore, further study of sleep deprivation is needed.

ASSESSMENT OF ANXIETY OUTCOMES

State-Trait Anxiety Inventory (STAI)

The STAI was first developed by C.D. Spielberger and R.L. Gorsuch in 1964 to assess the state and trait anxiety of college students (Spielberger et al., 1983). Since then, it has been revised and validated, and has been extensively used in research and clinical practice for different age groups in different cultures. STAI is a self-evaluation questionnaire, comprised of two separate self-reporting scales: (1) State-Anxiety Inventory (SAI), and (2) Trait-Anxiety Inventory (TAI).

The SAI Scale is used to evaluate anxiety experienced at a particular time, and it reflects a transitory emotional response to a stressful situation. In contrast, the TAI evaluates anxiety experienced in general, and reflects a stable predisposition to anxiety as determined by personality patterns *(Spielberger et al., 1983)*.

The STAI has been well documented for its validity and reliability. Its construct validity was examined by Spielberger using 197 high school students in four different situations: normal, relaxed, exam-related, and stressful. The mean scores of the exam-related situation were reported as statistically higher than the other situations, indicating a high validity *(Spielberger et al., 1983)*. The internal consistency estimates for the State-Anxiety Scale range from 0.83 to 0.92, and those of the Trait-Anxiety Scale range from 0.86 to 0.92. The test-retest reliability coefficients for Trait-Anxiety were high (0.73 to 0.86), while those for State-Anxiety were low (0.16 to 0.54). According to Spielberger and colleagues, the low reliability from the test-retest was expected to measure assessments of changes, such as anxiety which results from situational stress.

STAI is widely used in some research for in mechanical ventilated patients. Some studies measured state and trait anxiety by using STAI among in Mechanical Ventilated Patients already done *(Chlan et al., 2007; Mok & Wong, 2003; Sungkhaw, 2001; Wong, Nahas, & Molassiotis, 2001)*. One study *(Chlan, 2003)* developed a shortened State Anxiety Scale from the Spielberger SAI, with patients receiving mechanical ventilatory support. Studies by *Chlan et al (1993)* and *Wong, Lopez-Nahas, and Molassiotis (2001)* have used a shortened Spielberger state anxiety scale to measure anxiety in mechanical ventilated patients. In both studies, patients were alert and able to communicate by holding up fingers in response to questions. The internal consistency coefficient alphas were 0.67 and 0.72, respectively, which are less than the 0.82 originally reported for the 6-item Spielberger scale *(McKinley, Stein-Parbury, Chehelnabi, et al., 2004)*. Although this brief scale was minimally difficult for in mechanical ventilated patients, *Chlan (2003)* remained concerned about its validity for this population and recommended further work to develop an anxiety measurement suitable for in Mechanical Ventilated Patients.

A shortened 6-item version of the State Anxiety Inventory (SAI) was first developed by *Marteau and Bekker (1992)*. This shortened SAI was initially developed with 200 pregnant women and used item-reminder correlations to create a scale composed of six emotional items (calm, tense, upset, relaxed, content, worried) that had the highest correlations (0.53 - 0.71). However, when it was used in mechanical ventilated patients, the specific items of this STAI were puzzling to them, leading to uncertainty as to how to respond to the items. For example, "I feel content" was intended to be an anxiety-absent item. Many ventilator support patients had difficulty with this item, resulting in confusion about the meaning of the item and uncertainty about how they should respond to it *(Chlan, 2003)*. The 6-item version of the SAI was used to measure anxiety level changes in mechanically ventilated Chinese patients during music intervention studies. The internal consistency coefficient alphas were 0.67 *(Chlan, 1998)* and 0.72 *(Wong et al., 2001)*.

Visual Analogue Scale (VAS)

The VAS was developed about 60 years ago. It was used to measure many types of subjective phenomena, such as anxiety, pain, and mood states *(Aragon, Farris, & Jacqueline, 2002; McKinley, Stein-Parbury, Chehelnabi, et al., 2004)*. The analogue scale consists of a 1-100 mm line drawn on a paper with negative and positive statements about anxiety. The left side indicates no anxiety or zero anxiety, and the right side points to the highest level of anxiety. The patients were asked to show how much anxiety they felt by marking the analogue scale *(Redman, 2003)*.

The VAS can be used to measure anxiety levels in mechanical ventilated patients. However, *Chlan, Savik, and Weinert (2003)* explained that, although VAS is easy and quick to oversee on ventilated patients, the VAS has measurement limitations. Elderly patients may have difficulty conceptualizing the abstract nature of the VAS, which brings into question the validity of those responses *(Raisin as cited in Chlan et al., 2003)*. Moreover, the single item format of the VAS precludes rigorous psychometric testing to determine the reliability and validity of the instrument, resulting in a less precise measurement of anxiety *(Norman & Streiner, 1994, as cited in Chlan et al., 2003)*. Therefore, the VAS will not be used in this study.

Anxiety Status Inventory (ASI)

The Anxiety Status Inventory was developed by *Zung William in 1971 (Grimm, 1997)*. It consists of two parts. The first is the ASI, which is a 20-item rating scale. It evaluates the severity of anxiety symptoms on a 4-point rating scale, ranging from one, which means

no anxiety, to four, which indicates severe anxiety. The second part is a self-rating anxiety scale, which is a 20-item self-reporting scale.

The ASI consists of positive and negative statements that ask respondents if they have experienced anxiety within the last week. A "1" rating means little or no time, while a "4" rating means anxiety has been experienced most or all of the time. The reliability coefficient in the study was 0.66. The concurrent validity correlations with the Taylor manifest anxiety scale were 0.33 for ASI and 0.30 for the self-rating anxiety scale. However, there is no previous study cited which used this tool to measure anxiety in mechanical ventilated patients.

CONCLUSION

Anxiety is a common phenomenon in mechanical ventilated patients. Because anxiety can often go unrecognized, many patients never receive the help they need. A patient may become anxious if he lacks information about his symptoms or illness; receive a new or unextoms of panic are more severe than those of anxiety. The patient may feel smothered, dizzy, or faint; or he may experience tachycardia, trembling, numbness, chills, or chest pain. He may feel as if he is going crazy, losing control, or dying. To determine if your patient's anxious, assess his subjective responses to stressors (what he's feeling) and his objective responses (what you observe). MJN

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References

Alasad, J., & Ahmad, M. (2004). Communication with critically ill patients. Journal of Advanced Nursing, 50(4), 356-362.

American Psychiatric Association (2000). A psychiatric glossary. Available from http://www.apa.org/journals/webref.html

Aragon, D., Farris, C., & Jacqueline, B. (2002). The effects of harp music in vascular and thoracic surgical patients. Alternative Medicine, 8, 52-60.

Barnason, S., Zimmerman, L., & Nieveen, J. (1995). The effects of music interventions on anxiety in the patient after coronary bypass grafting. Hearth and Lung, 24, 124-132.

Bennum, I. (2001). Intensive care unit syndrome: A consideration of psychological interventions. British Journal of Medical Psychology, 74(3), 369-377.

Chlan, L. (1998). Effectiveness of music therapy intervention on relaxation and anxiety for patients receiving ventilatory assistance. Heart & Lung, 27, 169-176.

Chlan, L. (1998). Effectiveness of music therapy intervention on relaxation and anxiety for patients receiving ventilatory assistance. Hearth and Lung, 27, 169-176.

Chlan, L. (2003). Description of anxiety levels by individual differences and clinical factors in patients receiving mechanical ventilator support. Heart and Lung: The Journal of Acute and Critical Care, 32(4), 275-282.

Chlan, L. (2003). Description of anxiety levels by individual differences and clinical factors in patients receiving mechanical ventilatory support. Heart & Lung: The Journal of Acute and Critical Care, 32(4), 275-282.

Chlan, L., Engeland, W. C., Anthony, A., & Guttornson, J. (2007). Influence of music on the stress response in patients receiving mechanical ventilatory support: A pilot study. American Journal of Critical Care, 16, 141-145.

Chlan, L., Savik, K., & Weinert, C. (2003). Development of shortenend State Anxiety Scale from the Speilberger State-Trait Anxiety inventory (STAI) for patients receiving mechanical ventilatory support. Journal of Nursing Measurement, 11, 283-293.

Dahlen, I., & Janson, C. (2002). Anxiety and depression are related to the outcome of emergency treatment in patients with obstructive pulmonary disease. Chest, 122, 1633-1637.

Dhond, R. P., Yeh, C., Park, K., Kettner, N., & Napadow, V. (2008). Acupuncture modulates resting state connectivity in default and sensorimotor brain networks. Pain, 136, 407-418.

Dileo, C., Bradt, J., & Grocke, D. (2008). Music interventions for mechanically ventilated patients (Protocol). (4), 1-10. Retrieved from http://www.thecochranelibrary.com

Glas, G. (2003). A Conceptual History of Anxiety and Depression. In S. Kasper, J. A. d. Bear & J. M. A. Sitsen (Eds.), Handbook of Depression and Anxiety (2nd ed., pp. 1-47). New York: Marcel Dekker, Inc.

Griez, E., & Perna, G. (2003). Anxiety Disorder. In D. J. Nutt & J. C. Ballenger (Eds.), Respiration and Anxiety (pp. 251-267). UK: Blackwell Science Ltd.

Grimm, P. (1997). Measuring anxiety. In M. Frank-Stromborg & S. Olsen (Eds.), Instruments for clinical health-care research (pp. 329-341). Boston: Jones and Bartlett Publisher.

Guyton, A. C. (1991). Textbook of medical physiology (8th ed.). Philadelphia: W. B. Saunders Company.

Hartshorn, J., Lamborn, M., & Noll, M. L. (1993). Introduction to critical care nursing. Philadelphia: W.B. Saunders

Hooi, L. P. (2007). The effect of music intervention on anxiety and pain in female surgical patients. Unpublished Dissertation, Prince of Songkla University, HatYai.

Jastremski, C. A. (2000). Intensive care unit bedside environment: A nursing perspective. Critical Care Clinics, 16, 723-734.

Kelly, D. (1980). Anxiety and emotions. East Lawrence Avenue, Springfield: Charles C. Thomas Publisher.

Lindgren, V. A., & Ames, N. J. (2005). Caring for patients on mechanical ventilation. American Journal Nursing 105, 50-60.

Lusk, B., & Lash, A. A. (2005). The stress response, psychoneuroimmunology and stress among ICU patients. Dimension Critical Care Nurse, 24(1), 25-31.

Marteau, T. M., & Bekker, H. (1992). The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). Br J Clin Psychol, 31 (Pt 3), 301-306.

McKinley, S., Stein-Parbury, J., & Chehelnabi, A. (2004). Assessment of anxiety in intensive care patients by using the faces anxiety scale. American Journal of Critical Care, 13, 146-152.

McKinley, S., Stein-Parbury, J., Chehelnabi, A., & Lovas, J. (2004). Assesment of anxiety in intensive care patients by using the faces anxiety scale. American Journal of Critical Care, 13, 146-152.

Mitchell, M. (2003). Patient anxiety and modern elective surgery: a literature review. Journal of Clinical Nursing, 12, 806-815.

Mok, E., & Wong, K. Y. (2003). Effects of music on patient anxiety. AORN Journal, 77(2), 396-410.

Moser, D. K., Chung, L. M., Mung, L. M., McKinley, S., Riegel, B., An, K., et al. (2003). Critical care nursing practice regarding patient anxiety assesment and management. Intensive and Critical Care Nursing, 19, 276-278.

Nancy, S. R. (2000). Sleep in acute care settings: An integrative review. Journal of Nursing Scholarship, 32(1), 31-38.

Norton, C. (2005). The family's experience with criticall illness. In P. G. Morton, D. Fontanie, C. M. Hudak & B. M. Gallo (Eds.), Critical care nursing a holistic approach (pp. 27-45). Philadelphia: LWW Lippincot.

Paul, T., & Lemmer, B. (2007). Disturbance of circadian rhythms in analgosedated intensive care unit patients with and without craniocerebral injury. Chronobiology International: The Journal of Biological & Medical Rhythm Research, 24(1), 45-61.

Redman, B. K. (2003). Measurement tools in patient education (2nd ed.). New York: Springer Publishing Company, Inc.

Rotondi, A., Chelluri, L., Sirio, C., Mendelsohn, A., Schulz, R., Belle, S., et al. (2002). Patients' recollection of stressful experiences while receiving prolonged mechanical ventilation in an intensive care unit. Crit Care Med, 30, 746 - 752.

Sadock, B. J., & Sadock, V. A. (2003). Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry (9th ed.). Philadelphia: Lippincott William & Wilkins.

Seaward, B. L. (2002). Managing stress: principles and strategies for health and wellbeing (2nd ed.). London: Jones and Bartlett Publisher, Inc.

Shiow-Luan, T., Juei-Chin, W., Kuan-Chia, L., & Ue-Lin, C. (2005). Effects of acupressure therapy for patients having prolonged mechanical ventilation support. Journal of Advanced Nursing, 52, 142-150.

Shives, L. R. (2005). Basic concepts of psychiatric-mental health nursing (6th ed.). Philadelphia: J.B. Lippincott.

Speilberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). STAID-AD manual/sampler set. Palo Alto, California: Mind Garden, Inc.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). Manual for the State Trait Anxiety Inventory (form Y) ("Self-Evaluation Questionnaire"). Palo Alto, CA: Consulting Psychologists Press.

Sungkhaw, W. (2001). The effects of providing information and relaxation technique on anxiety in weaning from mechanical ventilation. Unpublished Thesis, Mahidol University, Bangkok.

Thomas, L. (2003). Clinical Management of Stressors Perceived by Patients on Mechanical Ventilation. Advanced Practice in Acute & Critical Care Psychosocial Issues, 14(1), 73-81.

Van de Leur, J., Zwaveling, J., Loef, B., & Van der Schans, C. (2003). Patient recollection of airway suctioning in the ICU: routine versus a minimally invasive procedure. Intensive Care Med, 29, 433 - 436.

Wong, H. L. C., Lopez-Nahas, V., & Molassiotis, A. (2001). Effects of music therapy on anxiety in ventilator-dependent patients. Heart & Lung, 30, 376-387.

Wong, H. L. C., Nahas, V. L., & Molassiotis, A. (2001). Effects of music therapy on anxiety in ventilator-dependent patients. Hearth and Lung, 30, 376-378.

Yagan, M. B., White, D., & Staab, J. (2000). Sedation of the mechanically ventilated patient. Critical Care Nursing Quarterly, 22(4), 90-100.