Sleep deprivation has profound effects on an individual's functioning abilities whether he is in good or ill health. Adequate rest and sleep is vital for optimal physical and psychosocial functioning of the individual. Without proper amount of rest and sleep the ability to concentrate, make judgments and participate in daily activities decreases (Potter and Perry, 1999). During illness there may be either actual or potential sleep disturbances and this lack of sleep extends the time needed to recover from illness (Hudak, Gallo and Benz, 1994). There, for sick patients rest and sleep must be considered as one of the important components of their therapy. Nurses must help patients to achieve optimum rest and sleep in order to expedite the process of their healing and recovery.

Most often, high dependency patients in critical care units develop problems like confusion, hypoxia, electrolyte imbalance, increased restlessness, irritability and hallucinations which may be related to sleep disturbance. It is, therefore, crucial to review the various aspects of sleep, factors affecting the sleep patterns of critically ill patients and related nursing interventions in order to reduce and prevent sleep disturbances in high dependency patients in critical care units.

Sleep and Physiological aspects of sleep
Lindeman and McArthur (1999) defines sleep as a period of diminished responsiveness to external stimuli that regularly alternates with periods of wakefulness. Hartmann (1973) describes sleep as a regular, recurrent, easily reversible state of an organism characterized by relative quiescence and by a great increase in the threshold of response to external stimuli.

Sleep is a complex physiologic and cyclic phenomenon influenced by an individual's biologic clock that regulates not only sleep but also levels of alertness throughout the day. Sleep involves two phases:
(i) Active sleep, commonly known as rapid eye movement (REM) sleep; and
(ii) Quiet sleep, called non-rapid eye movement (NREM) sleep.

(i) Active or REM sleep: This is characterized by bursts of eye movements and some twitching of small facial muscles. In REM sleep the EEG is active and closely resembles that found in the waking state. This phase begins about 90 minutes after sleep has begun.

(ii) Quiet or NREM sleep: There are four stages of NREM sleep.
- Stage 1 NREM: Includes lightest level of sleep and lasts for a few minutes.
- Stage 2 NREM: Relaxation progresses, although arousal is still easy. Body functions continue to slow down. This stage lasts for 10-20 minutes.
- Stage 3 NREM: is the initial stage of deep sleep. In this stage the person is difficult to arouse and rarely moves, muscles are completely relaxed, vital signs decline but remain regular. This stage lasts for 15-30 minutes.
- Stage 4 NREM: is the deepest level of sleep and lasts for 15-30 minutes. The person is completely relaxed and may not move and extremely difficult to arouse. During this stage there is an increased release of hormones regulating growth and promoting tissue healing. Sleep walking and enuresis may occur during this stage.

The sleep cycle is shown in figure 1.

During sleep, the individual passes through four to six sleep cycles. Each cycle consists of four stages of NREM and a period of REM sleep. In the final cycle, the individual continues beyond REM to stage 1 and the individual wakens.

Circadian rhythm
The period of sleep and wakefulness are controlled by cyclical rhythms regulating physiol-
ogy and behavioural responses. This phenomenon broadly follows a 24 hour pattern and is known as diurnal or circadian rhythm. The human body is equipped with a biological time clock that regulates its activities which includes body temperature, heart rate, blood pressure and sleep. The fluctuation in many physiological functions such as drop in temperature, blood pressure and heart rate are seen during night and are dependent on the 24 hour cycle.

Functions of sleep

It is difficult to establish the purpose of sleep till date. During stage 4 NREM sleep the body releases human growth hormones for the repair and renewal of epithelial and specialized cells such as brain cells.

The functions of REM sleep are important for cognitive restoration and are associated with changes in cerebral blood flow, increased cortical activity, oxygen consumption and epinephrine release. This will eventually help in memory storage and learning.

Hemenway (1980) observed the reduction of adrenal hormones as the clinical effects of sleep deprivation and reported that in case of deep sleep (stage 3 & 4) deprivation, the release of adrenal hormones may not coordinate with stress the person is about to face. Consequently, the patient's ability to cope with the stress of a critical illness will be lowered and may significantly alter his or her recovery phase.

Factors affecting sleep

The following factors more often affect the sleep of a patient admitted in the critical care unit.

- **Illness**: Any illness or condition causing pain, difficulty in breathing, nausea, incontinence, anxiety and stress can result in sleep problems. Illness disturbs the normal rhythms of sleep and wakefulness. People who are ill require more sleep because of their need for increased growth hormone to promote tissue repair as their normal sleep pattern is disturbed already due to illness. Critical care unit patients are highly dependent on the services of healthcare staff. The constant need for physiological monitoring, physiotherapy, nursing interventions, the feeling of being away from home and family members tend to affect the sleep pattern of the patient.

- **Environment**: The strange environment too warm or too cold room temperature, the necessary hi-tech equipment and the presence of various categories of healthcare staff required in caring for high dependence patients can cause sleep disturbances.

- **Noise**: Disruptive noise produced by various life sav-
ing equipments can be disturbing to patients. The voices of healthcare staff at the nurses’ station, noise of telephones, checking of vital signs by the staff may interfere with the patient’s rest and sleep.

- Discomfort: Discomfort of any kind interferes with a person’s ability to rest and sleep. Patients in critical care units are encountered with various monitoring devices, ventilators, wound drainages, urinary drainages, chest drainages, oxygen therapy, nasogastric intubation, plaster casts, etc. This imposes a restriction on their movements resulting in an increased level of anxiety, stress and discomfort.

- Pain: Pain is found to be one of the most common causes of discomfort contributing to sleep loss in patients in intensive care units as reported by Jones et al (1979).

- Anxiety/stress: A person’s current level of anxiety/stress can alter his sleep patterns. Admission to the critical care unit signals a threat to life and well being to all who are admitted. Anxiety is experienced by the patient due to the unfamiliar environment where one’s life is in the hands of strangers.

- Drugs: The liberal use of some drugs such as narcotics and sedatives have a high tendency to cause addiction or habituation having an effect on the quality of sleep. Central nervous system (CNS) stimulants as well as CNS depressants should be used sparingly in order to reduce sleep disturbances. Withdrawal from these drugs can also cause sleep disturbances and must be managed carefully.

Nursing intervention

Prevention of sleep disturbances and deprivation is an important nursing responsibility, especially with very sick patients, in whom rest and sleep are essential components of their therapy.

The approaches to prevent sleep disturbances should include:
- Assessment of a patient’s sleep pattern
- Specification of patient’s problem relating to sleep deprivation
- Strategies for the prevention of sleep disturbances
- Evaluation of the effectiveness of nursing intervention carried out.

Assessment of patient’s sleep pattern

Along with the nursing assessment of activities of daily living, assessment of patient’s sleep pattern should also be carried out in order to identify the signs and symptoms of sleep disturbances and establishing the patients’ sleep care needs.

Specification of a patient’s problem relating to sleep deprivation

Some of the problems of the patient relating to an altered sleep pattern are:
- Difficulty in falling asleep
- Sleep pattern disturbance relating to noise/bright light/pain/discomfort
- Confusion, irritation or altered thought process related to lack of sleep
- Fatigue, lethargy related to disturbed sleep

Strategies for the prevention of sleep disturbances

Nurses have an important role in preventing sleep disturbances and ensuring quality sleep for patients in their care. The following are some strategies to prevent sleep disturbances pertaining to the factors affecting sleep:

(i) Anxiety/Stress reduction
- Reassure the patient
- Provide adequate information and explanation to the patient
- Allow the patient and help him in making decisions regarding the treatment whenever possible.

(ii) Environmental controls
- Switch off bright lights when not in use. Use dim lights at night
- Close doors noiselessly
- Maintain unit temperature at a constant level. Avoid extremes of temperatures.

(iii) Noise control
- Keep necessary conversations at a low level away from patients’ room
- Turn down telephones. It is preferable to have telephones away from the patient unit
- Wear rubber soled shoes. Avoid clogs.
- Turn off equipment not in use
- Make the floor of the unit sound proof.
- Noiseless doors
- Close doors of the patients’ room whenever possible.

(iv) Promoting comfort
- Keep bed linen clean, dry and wrinkle free
- Ensure a comfortable position and support limbs when necessary
- Give a relaxing back massage prior to bed time
- Administer sedatives/analgesics after attending the patient completely and before the bright lights are switched off.
(v) Relieving pain

- Assess patients' pain regularly
- Administer analgesia as prescribed 30 minutes before bedtime

(vi) Drugs administration to promote sleep

- Assess and establish patients' need for medication
- Administer the prescribed drugs with due precaution
- Observe and report signs and symptoms of adverse effects of the drugs administered, if any.

Evaluation of the effectiveness of nursing intervention carried out

It is essential to evaluate the effectiveness of nursing interventions in the prevention of sleep disturbance of patients. Therefore, a continuous detailed assessment of the patient's sleep pattern is required to establish the factors adversely affecting rest and sleep in order to modify nursing interventions to prevent sleep deprivation.

Confusion

It is common for any hospitalized patient, especially a patient in a critical care unit to experience some sleep disturbances. It is also true that some of the factors affecting sleep cannot be controlled or eliminated by the nurses. However, the nurse must apply her knowledge, sensitivity and experience and demonstrate positive attitude and standard of practices in order to prevent sleep deprivation of the patients under their care.

References:

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