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Review Article

Nursing Interventions to promote sleep in COPD patients

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Abstract

Chronic obstructive pulmonary disease COPD, or chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe. Worldwide, COPD is a leading cause of chronic morbidity and mortality. Patients with COPD have a higher prevalence of insomnia, nightmares and daytime sleepiness than the general population. The nurse plays vital role in management of sleep related issues of COPD. This article focuses on the nursing interventions to promote sleep in COPD patients in the current era.

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Introduction

COPD, or chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe. COPD can cause coughing that produces large amounts of mucus, wheezing, shortness of breath, chest tightness, and other symptoms. Cigarette smoking is the leading cause of COPD. Most people who have COPD smoke or used to smoke. Long-term exposure to other lung irritants—such as air pollution, chemical fumes, or dust—also may contribute to COPD [1].

Worldwide, COPD is a leading cause of chronic morbidity and mortality [2]. COPD is a leading and still-increasing cause of chronic morbidity and mortality worldwide, [3] and according to the World Health Organization (WHO), it is the fifth most common cause of death and the 10th most burdensome disease [3]. Chapman et al. [4] and Mannino et al., [5] projected that between 1990 and 2020, COPD will become the third most common cause of death worldwide. A Dutch study predicts that an increase of 76% in the prevalence of COPD can be expected within approximately twenty years [1].

Indian Study on Epidemiology of Asthma, Respiratory Symptoms and Chronic Bronchitis in Adults (INSEARECH) involving a total of 85105 men, 84470 women from 12 urban and 11 rural sites was reported. This study had shown that the overall prevalence of chronic bronchitis in adults >35 yr was 3.49 per cent (ranging 1.1% in Mumbai to 10% in Thiruvananthapuram). Thus there are wide variations in the prevalence of COPD in India subcontinent [8] COPD (Chronic obstructive pulmonary disease) is a major cause of morbidity and mortality in India especially in rural areas [9].

Chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema, is a chronic lung disease that makes it hard to breathe.

- Chronic bronchitis- the airways that carry air to the lungs get inflamed and make a lot of mucus. This can narrow or block the airways, making it hard for you to breathe.

- Emphysema - In a healthy person, the tiny air sacs in the lungs are like balloons. As you breathe in and out, they get bigger and smaller to move air through your lungs. But with emphysema, these air sacs are damaged and lose their stretch. Less air gets in and out of the lungs, which makes you feel short of breath [7].

Patients with COPD have a higher prevalence of insomnia, nightmares and daytime sleepiness than the general population [10], with close to 50% of patients reporting significant disturbance in sleep quality [11]. Patients with severe COPD commonly exhibit abnormal sleep like insomnia contributing to chronic fatigue, daytime sleepiness. Additionally, medications used to treat COPD, such albuterol or prednisone may affect sleep quality. A nocturnal reduction of nocturnal oxygen levels commonly seen in patients with COPD can have profound effects and contribute to long-term sequelae, producing arrhythmias, myocardial stress, and, possibly, lower survival[12.] Sleep disturbance is one of the most common symptoms reported by COPD patients, occurring in ~40% of patients [12].

Sleep has several effects on breathing, which include changes in central respiratory control, lung mechanics and muscle contractility that do not have an adverse effect in healthy individuals but may result in significant hypoxaemia and hypercapnia in patients with chronic obstructive pulmonary disease (COPD), particularly during rapid eye movement (REM) sleep [13].
These patients have problems initiating or maintaining sleep, and have increased light sleep and reduced REM sleep, frequent sleep stage shifts and micro-arousals. Sleep efficiency is low, in the range of 50–70%, in the majority of this patient population. Sleep disturbance likely contributes to the non-specific daytime symptoms of chronic fatigue, lethargy and overall impairment in quality of life described by these patients. Night-time symptoms in COPD patients frequently go unnoticed by physicians and/or are not reported by patients themselves [14].

Nursing management of COPD patients sleep

Sleep is a basic physiological need for all humans. People need to sleep and rest enough for a healthy and productive life. However, some factors may prevent attainment of adequate sleep and rest. While some of these factors may cause transient alterations in an individual's sleeprest routine, other factors can affect sleep chronically. Chronic systemic diseases are one of the most important factors that can affect the characteristics of people's sleep for a long-time period. Chronic diseases cause various sleep problems and impair sleep quality. One of the chronic systemic diseases that affects the sleep routine and sleep quality of people severely is Chronic Obstructive Pulmonary Disease (COPD).

The respiratory system provides the oxygen that the body needs on one part, it helps remove the carbon dioxide produced by the body's metabolic processes on the other part. Arrangement of the functions of the respiratory system basically occurs through negative feedback [15]. Ventilation is normally controlled by a combination of two systems: a metabolic system responsible for the automatic changes directly related to gas exchange, and a behavioral system responsible for the voluntary changes originating from cortical and forebrain structures [16,17] While metabolic rate decreases during sleep, responses to various chemical, mechanical, and cortical stimuli also decrease. The respiratory response to the changes observed in the partial oxygen and partial carbon dioxide pressures in the arterial blood differs significantly in comparison to the wakefulness period [18] Especially during REM sleep, such physiological changes may affect gas exchange and lead to hypoventilation resulting in clinically significant hypoxemia and hypercapnia in patients with COPD0 [19]

The common nursing management for the COPD patient with sleep problems

Assessment

- History, character, onset, and duration of symptoms

- Dyspnea, including its effects on ADLs and whether it is associated with any specific illness or event
- Cough
- Sputum production (amount, color, consistency)
- Pain in right upper quadrant (hepatomegaly)
- Smoking history
- Family history of COPD, respiratory illnesses
- Disease history, especially influenza, pneumonia
- History of respiratory tract infections, chronic sinusitis
- Past or present exposure to environmental irritants at home or at work
- Self-care modalities used to treat symptoms
- Current pattern of activity and rest, willingness to exercise
- Nutritional status—caffeine and alcohol use, history of eating disorders, weight history, food allergies, body mass index
- Medications taken and their effectiveness in relieving symptoms
- Sleeping habits
- Environment of sleep
- Sleep duration
- Characteristics of sleep
- Extend of the problems and difficulties observed by the patient.

Physical Examination:
Assess for:

- General appearance (Appearance and hygiene may be indicators of symptom interference with ADLs. Patient may appear underweight, overweight, or bloated, and skin color may be dusky or pale.) Increased AP diameter of chest (“barrel chest”)
- Eye ,eye lids
- Orientation and mental status
- Patients yawning episodes
- Dependent edema and jugular venous distention
- Enlarged or tender liver
- Elevated temperature, tachycardia, tachypnea
- Use of accessory muscles of breathing, forward-leaning (tripod) posture, pursed-lip breathing, central cyanosis, clubbed fingers
- Sputum production: amount, color, consistency, time of day, change from baseline
- Signs of an altered sensorium (restlessness or lethargy), which may be the first indicator of hypoxia
- Auscultation of breath sounds, which may be distant as a result of increased AP diameter and decreased airflow; commonly reveal crackles (rales), especially in dependent lung fields; rhonchi (gurgles); and wheezes, especially on forced exhalation
- Relevant laboratory findings, including an elevated hemoglobin, hematocrit, and WBC count; alterations in ABGs; decreased FEV1, decreased VC, normal diffusing capacity, and normal to increased lung volumes (TLC, FRC, RV).

Nursing diagnosis (sleep)

- Sleep pattern disturbance
- Disturbed Sleep Pattern
- Insomnia

Nursing intervention for sleep management

- Determine the client’s sleep and activity pattern
- Encourage patient to establish a bedtime routine to facilitate transition from wakefulness to sleep.
- Encourage him to eliminate stressful situations before bedtime
- Monitor bedtime food and beverage intake for items that facilitate or interfere with sleep.
- Create an atmosphere to facilitate trust
- Encourage verbalization of feelings, perceptions, and fears
- Determine the client’s decision-making ability.
- discourage long periods of sleep during the day unless signs and

symptoms of sleep deprivation exist or daytime sleep is usual for client

- perform actions to relieve discomfort if present (e.g. reposition client; administer prescribed analgesics, antiemetics, or muscle relaxants
- encourage participation in relaxing diversional activities
- discourage intake of foods and fluids high in caffeine (e.g. chocolate, coffee, tea, colas)
- offer client an evening snack that includes milk or cheese unless contraindicated (the L-tryptophan in milk and cheese helps induce and maintain sleep)
- satisfy basic needs such as comfort and warmth before sleep
- encourage client to urinate just before bedtime
- reduce environmental distractions (e.g. close door to client's room; use night light rather than overhead light whenever possible; lower volume of paging system; keep staff conversations at a low level and away from client's room; close curtains between clients in a semi-private room or ward; keep beepers and alarms on low volume; provide client with "white noise" such as a fan, soft music, or tape-recorded sounds of the ocean or rain; have sleep mask and earplugs available for client if needed)
- ensure good room ventilation
- encourage client to avoid drinking alcohol in the evening (alcohol interferes with REM sleep)
- if possible, administer medications that can interfere with sleep (e.g. steroids, diuretics) early in the day rather than late afternoon or evening
- administer prescribed sedative-hypnotics if indicated
- perform actions to reduce interruptions during sleep (80 - 100 minutes of uninterrupted sleep is usually needed to complete one sleep cycle)
- restrict visitors
- group care (e.g. medications, treatments, physical care, assessments) whenever possible.
- Provide measures to take before bedtime to assist with sleep (e.g., quiet time to allow the mind to slow down, carbohydrates such as crackers, or a back massage). *Simple measures can increase quality of sleep. Carbohydrates cause release of the neurotransmitter serotonin, which helps induce and maintain sleep (Somer, 1999). Research has shown back massage to effectively promote sleep (Richards, 1994).*
- Keep environment quiet (e.g., avoid use of intercoms, lower volume on radio and television, keep beepers on nonaudio mode, anticipate alarms on IV pumps, talk quietly on unit). *Excessive noise causes sleep deprivation that can result in ICU psychosis (Barr, 1993). Health volunteers exposed to recorded critical care noise levels experienced poor sleep (Topf, 1992). More than half of the noises in ICUs were caused by human behavior such as talking and TV watching (Kahn, Cook, 1998).*

For hospitalized stable clients, consider instituting the following sleep protocol to foster sleep:

- Night shift: Give client the opportunity for uninterrupted sleep from 1 AM to 5 AM. Keep environmental noise to a minimum.
- Evening shift: Limit napping between 4 PM and 9 PM. At 10 PM turn lights off, provide sleep medication according to individual assessment, and keep noise and conversation on the unit to a minimum.
- Day shift: Encourage short naps before 11 AM. Enforce a physical activity regimen as appropriate. Schedule newly ordered medications to avoid waking client between 1 AM and 5 AM.

- Encourage social activities. Help elderly get outside for increased light exposure and to enjoy nature. *Exposure to light and social interactions influence the circadian rhythms that control sleep (Elmore, Betrus, Burr, 1994; Sateia et al, 2000).*
- Suggest light reading or TV viewing that does not excite as an evening activity. *Soothing activities decrease stimulation of the reticular activating system and helpsleep come naturally.*
- Increase daytime physical activity. Encourage walking as client is able.
- Reduce daytime napping in the late afternoon; limit naps to short intervals as early in the day as possible. *The majority of elderly nap during the day (Evans, Rogers, 1994). Avoiding naps in the late afternoon makes it easier to fall asleep at night.*
- Help client recognize that there are changes in length of sleep. Client may not be able to sleep for 8 hours as when younger, and more frequent awakening is part of the aging process (Floyd et al, 2000).
- If client continues to have insomnia despite developing good sleep hygiene habits, refer to a sleep clinic for further evaluation (Pagel, Zafralotfi, Zammit, 1997).
- Provide support to the family of client with chronic sleep pattern disturbance. *Ongoing sleep pattern disturbances can disrupt family patterns and cause sleep deprivation in the client or family members, which creates increased stress on the family.*
- Encourage client to avoid coffee and other caffeinated foods and liquids and also to avoid eating large high-protein or high-fat meals close to bedtime. *Caffeine intake increases the time it takes to fall asleep and increases awake time during the night (Evans, Rogers, 1994). A full stomach interferes with sleep.*
- dvise the client that research on use of melatonin is still equivocal. While it may help the client to fall asleep faster, it does not improve the quality or length of time in the sleep interval, and long-term results are unknown (Hughes, Sack, Lewy, 1998; Defrance, Quera-Salva, 1998; Walsh et al, 1999).
- Ask client to keep a sleep diary for several weeks.*Often the client can find the cause of the sleep deprivation when the pattern of sleeping is examined (Pagel, Zafralotfi, Zammit, 1998).*
- Teach relaxation techniques, pain relief measures, or the use of imagery before sleep.
- Teach client need for increased exercise. Encourage to take a daily walk 5 to 6 hours before retiring. *Moderate activity such as walking can increase the quality of sleep (King et al, 1997).*

Teach the following guidelines for good sleep hygiene to improve sleep habits:

- Go to bed only when sleepy.
- When awake in the middle of the night, go to another room, do quiet activities, and go back to bed only when sleepy.
- Use the bed only for sleeping—not for reading or snoozing in front of the television.
- Avoid afternoon and evening naps.
- Get up at the same time every morning.
- Recognize that not everyone needs 8 hours of sleep.
- Move the alarm clock away from the bed if it is a source of distraction.
- Do not associate lulls in performance with sleeplessness; sleeplessness should not be blamed for everything that goes wrong during the day.

Evaluation

- After nursing intervention the patient able to display improvement insleeping patternas evidenced by:
- The patientverbalized:
- The patient does not look weak and restlessness scompare to the past
- The presence of eye bags has been minimized or has gone.
- Decrease of the usual yawning

Conflict of interest: None

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