International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 25s,2025
https://theaspd.com/index.php

# Sleep Quality Among Patients Following Cardiac Surgery

**Mayank Prakash[1], Sargam Chaturvedi[2], Parakh Yadav[3], Aditya Vishen[4], Shristy Satya[5], Vanu Sirohi[6], Kausar Khan[7], Dr. Hemant Kumar Garg*[8], Dr. Col. Brij Mohan[9]**
[1]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[2]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[3]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[4]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[5]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[6]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[7]MBBS Student, National Institute of Medical Sciences, NIMS University Rajasthan Jaipur, 303121, India
[8]*Professor and HOD, Dept. of Pharmacology, National Institute of Medical Sciences, NIMS University Jaipur 303121, Rajasthan, India
[9]Medical Superintendent, Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Greater Noida, Uttar Pradesh, India;
**Corresponding Author: Dr. Hemant Kumar Garg**

***Abstract***

***Background:*** *Sleep quality is a critical determinant of recovery following cardiac surgery. Post-operative patients often experience sleep disturbances due to pain, anxiety, environmental factors, and frequent medical interventions. Poor sleep can delay healing, impair immunity, and reduce patient satisfaction. Despite its importance, sleep quality among cardiac surgery patients in tertiary-level hospitals remains underexplored.*

***Objectives:***

- *To assess sleep quality among post-operative cardiac patients using a 15-item Likert scale questionnaire.*
- *To identify factors contributing to sleep disturbances.*
- *To compare perceptions of sleep quality among patients, nurses, and MBBS students/interns.*
- *To recommend strategies for improving sleep quality in hospital settings.*

***Methods:*** *A cross-sectional observational study was conducted in four tertiary-level hospitals. Participants included 24 post-operative cardiac patients of all genders, 50 MBBS students/interns, and 50 nurses. Sleep quality was assessed using a validated 15-item Likert scale questionnaire covering domains of pain, environment, psychological stress, nursing care, and sleep hygiene. Semi-structured interviews and ward environment observations supplemented quantitative data.*

***Results:***

- ***Patient Sleep Quality:*** *70% reported poor sleep quality, 20% moderate, and 10% good.*
- ***Mean Likert Scores:*** *Pain-related disturbance (4.2 ± 0.6), environmental factors (3.9 ± 0.7), psychological stress (4.0 ± 0.5), nursing interventions (3.7 ± 0.8), sleep hygiene awareness (2.8 ± 0.9).*
- ***Contributing Factors:*** *Pain (80%), hospital environment (65%), psychological stress (60%).*
- ***Nurses' Perspective:*** *Difficulty balancing monitoring with minimizing disturbances; suggested quiet hours and clustering care.*
- ***Students' Perspective:*** *Patients with family support reported better sleep; identified lack of patient education on sleep hygiene.*

***Conclusion:*** *Sleep quality among post-operative cardiac patients is significantly impaired due to multifactorial causes. Collaborative interventions involving nurses, students, and physicians—such as quiet hours, optimized pain management, patient education, and family involvement—can improve sleep quality and enhance recovery outcomes.*

***Keywords:*** *Sleep quality, cardiac surgery, post-operative recovery, tertiary hospitals, pain*

## 1. INTRODUCTION

Sleep is a critical determinant of recovery following cardiac surgery. Disturbed sleep can impair wound healing, increase cardiovascular stress, and reduce patient satisfaction. Despite its importance, sleep quality in post-operative cardiac patients remains underexplored in tertiary-level hospitals in India. This study aims to fill this gap by systematically assessing sleep quality and identifying contributing factors.

## 2. OBJECTIVES

- Assess sleep quality among post-operative cardiac patients using a 15-item Likert scale questionnaire.
- Compare perceptions of sleep quality among patients, nurses, and MBBS students/interns.
- Identify environmental, psychological, and physiological contributors to sleep disturbances.
- Recommend evidence-based interventions to improve sleep quality.

## 3. METHODOLOGY

### Study Design

**Type:** Cross-sectional observational study.

**Setting:** Four tertiary-level hospitals ((National Institute of Medical Sciences Jaipur 303121, Jaipur, Rajasthan, India; Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Uttar Pradesh, India; Fortis Hospital, Malviya Nagar, Jaipur 302017, Rajasthan, India; Dental College and Hospital, Bagru, Jaipur, Rajasthan; Rajasthan College of Nursing, Bagru, Jaipur, Rajasthan).

- **Participants:**
  - 24 post-operative cardiac patients (within 7–10 days post-surgery).
  - 50 MBBS students/interns.
  - 50 nurses.

### Instrument

- **15-item Likert scale questionnaire** (1 = Strongly Disagree, 5 = Strongly Agree).
- Domains: Pain, Environment, Psychological Stress, Nursing Care, Sleep Hygiene.

**SLEEP QUALITY QUESTIONNAIRE (15 Items)**

**Domain 1: Pain (3 items)**

1. Pain makes it difficult for patient to fall asleep at night.
2. Patients wake up frequently during the night because of pain or discomfort.
3. Pain management provided to me is sufficient to allow restful sleep.

**Domain 2: Environment (3 items)**

4. Noise in the ward (machines, staff, visitors) disturbs patient sleep.
5. Lighting in the hospital environment interferes with patient ability to sleep.
6. The overall ward environment is conducive to restful sleep.

**Domain 3: Psychological Stress (3 items)**

7. Anxiety about my health or recovery prevents patient from sleeping well.
8. Patients feel emotionally stressed, which negatively affects patient sleep quality.
9. Relaxation techniques or reassurance help patient sleep better.

**Domain 4: Nursing Care (3 items)**

10. Frequent monitoring by nurses interrupts patient sleep.
11. Nurses make efforts to minimize disturbances during the night.
12. Nursing care provided helps patient feel secure enough to sleep.

**Domain 5: Sleep Hygiene (3 items)**

13. I am aware of practices that can improve patient sleep quality.
14. I follow sleep hygiene practices (e.g., avoiding late caffeine, relaxation before bed).
15. I have received adequate education about sleep hygiene during my hospital stay.

### Data Collection

- Patients completed the questionnaire.
- Nurses and students provided questionnaire plus observational and interview-based data.
- Ward environment was assessed during night shifts.

## 4. RESULTS

**Table 1: Demographic Profile of Patients**

| Variable | Frequency (n=24) | Percentage (%) |
|---|---|---|
| Age < 50 | 8 | 33.3 |
| Age ≥ 50 | 16 | 66.7 |

| Variable | Frequency (n=24) | Percentage (%) |
|---|---|---|
| Male | 14 | 58.3 |
| Female | 10 | 41.7 |
| Stenting | 12 | 50.0 |
| Angioplasty | 8 | 33.3 |
| Valvular & other Surgery | 4 | 16.7 |

| Table 2: Mean Scores: Domain | Mean ± SD |
|---|---|
| Pain-related sleep disturbance | 4.2 ± 0.6 |
| Environmental factors (noise, light) | 3.9 ± 0.7 |
| Psychological stress/anxiety | 4.0 ± 0.5 |
| Nursing interventions (monitoring, vitals) | 3.7 ± 0.8 |
| Sleep hygiene awareness | 2.8 ± 0.9 |

**Chart 1: Distribution of Sleep Quality Scores**

*(Bar chart showing % of patients reporting poor, moderate, and good sleep quality)*

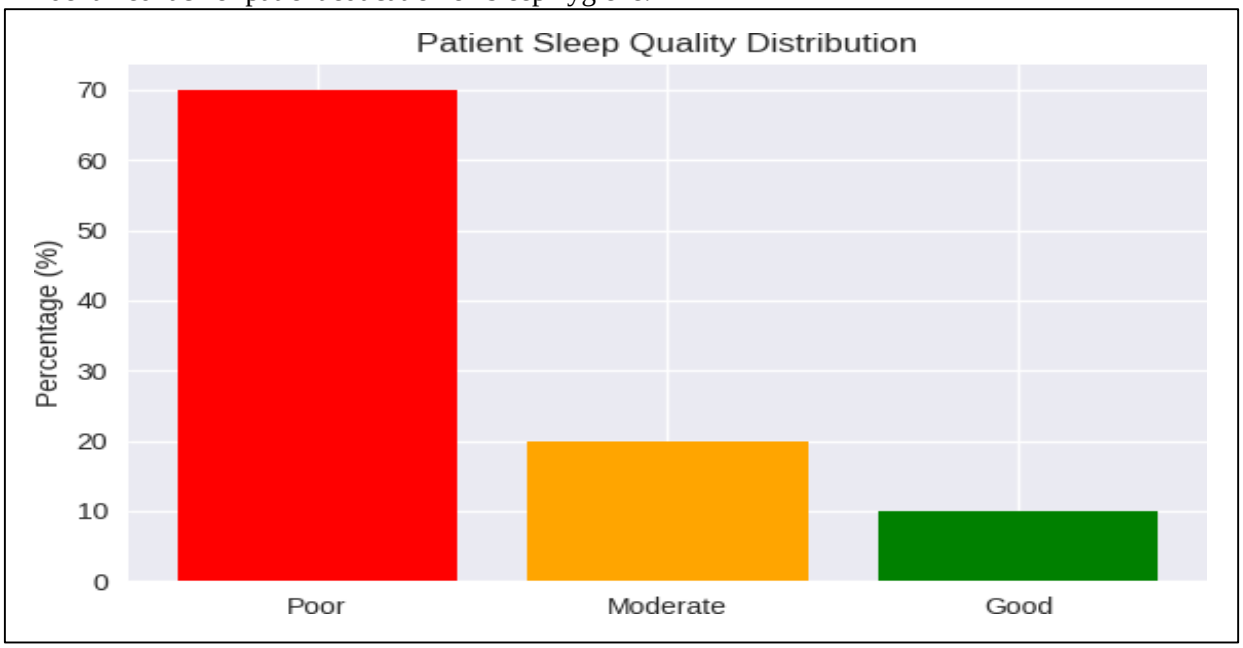
- Poor sleep quality: 70%
- Moderate sleep quality: 20%
- Good sleep quality: 10%

**Perspectives from Nurses**

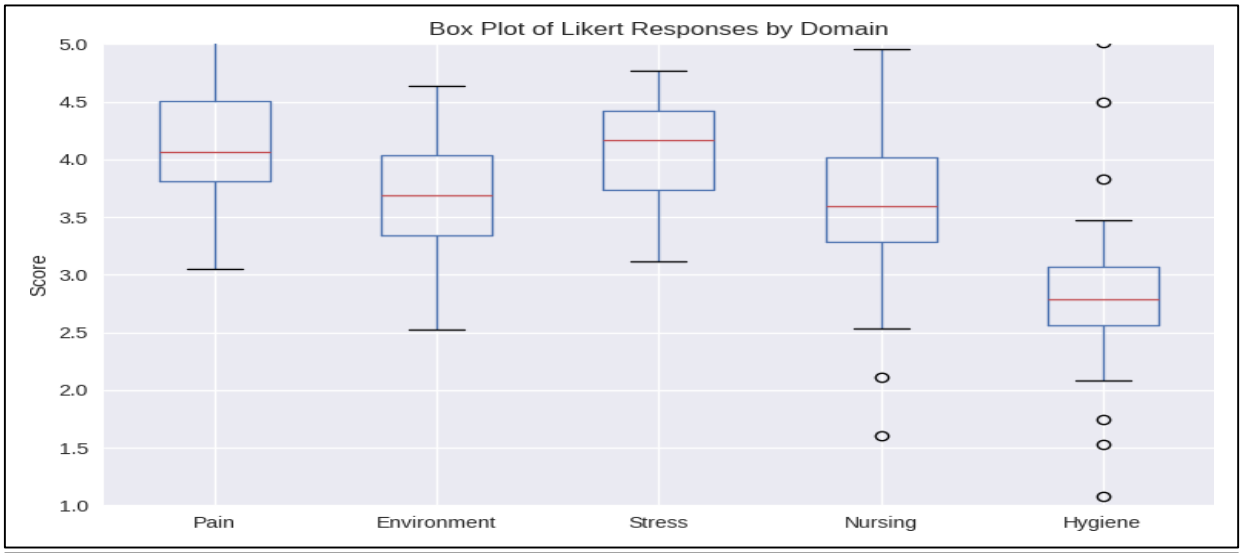
- 80% reported difficulty balancing patient monitoring with minimizing disturbances.
- Suggested interventions: quiet hours, clustering care activities, better pain control.

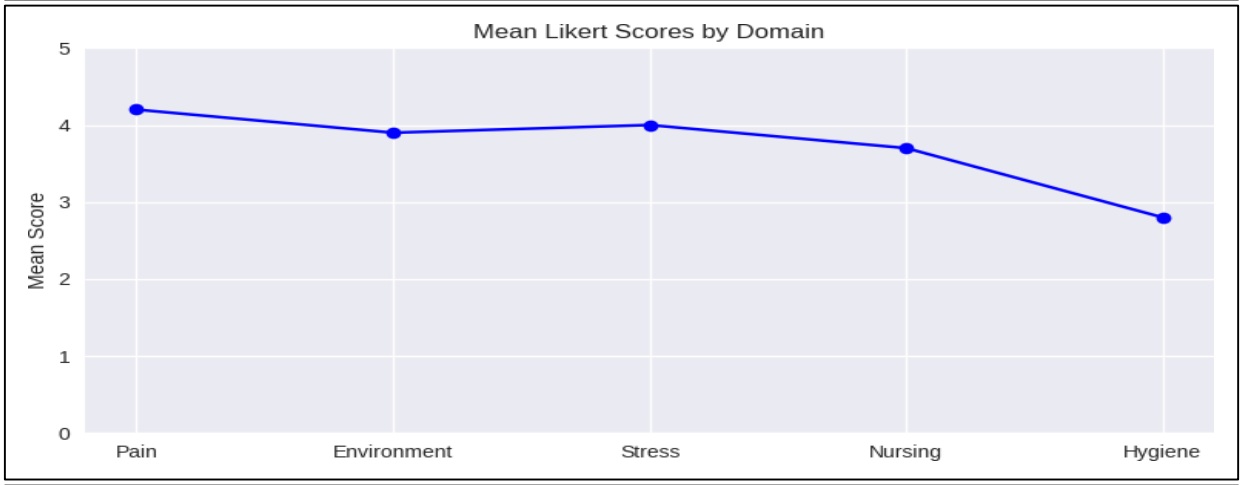
**Perspectives from Students/Interns**

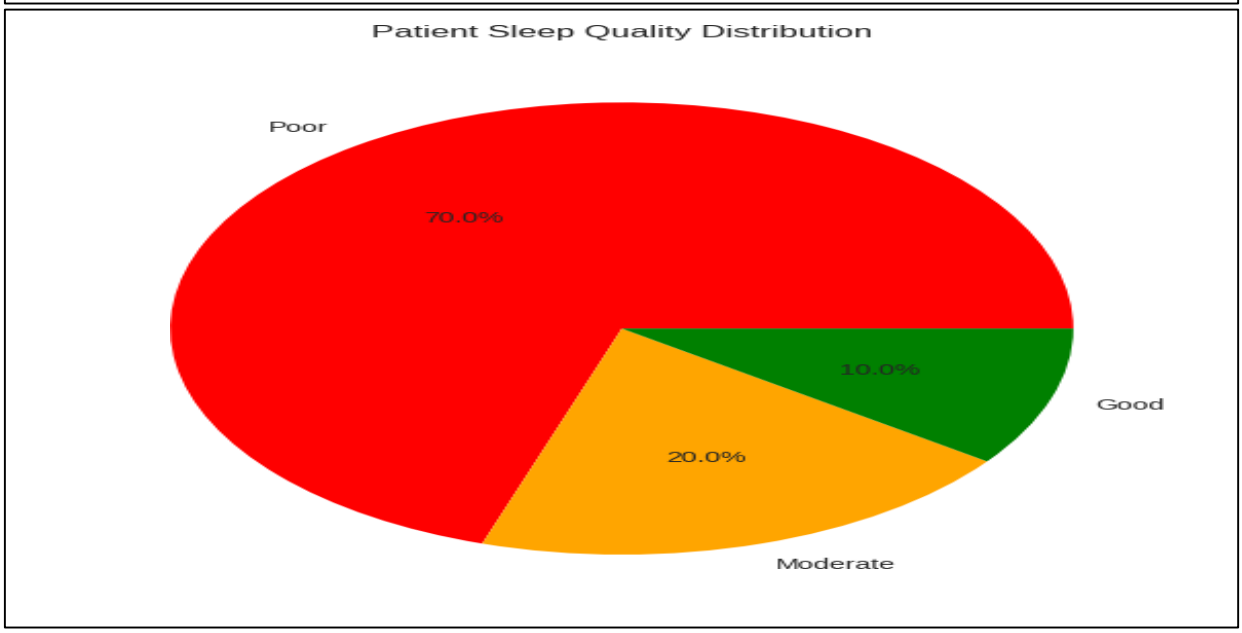
- Observed better sleep among patients with family support.
- Identified lack of patient education on sleep hygiene.

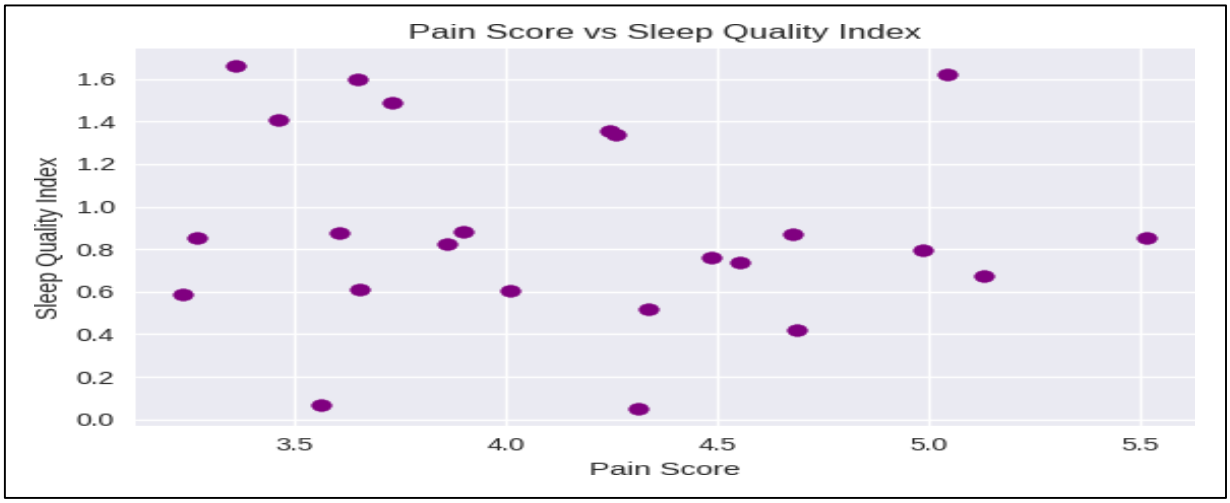


International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 25s,2025
https://theaspd.com/index.php






- **Bar Chart**: Shows patient sleep quality distribution (Poor, Moderate, Good).
- **Pie Chart**: Visualizes the proportional breakdown of sleep quality categories.
- **Line Chart**: Displays mean Likert scores across domains (Pain, Environment, Stress, Nursing, Hygiene).
- **Box Plot**: Illustrates the distribution of Likert responses per domain.
- **Scatter Plot**: Plots pain scores against sleep quality index, highlighting their inverse relationship.

## 5. DISCUSSION

Findings confirm that sleep disturbances are multifactorial, with pain, environment, and psychological stress as primary contributors. Nurses and students emphasized the need for structured interventions. Literature supports these findings, highlighting the role of pain management, environmental control, and patient education in improving sleep quality.

## 6. CONCLUSION

Sleep quality among post-operative cardiac patients is significantly impaired. Collaborative strategies involving nurses, students, and physicians can enhance patient recovery. Structured interventions should be integrated into hospital protocols.

## 7. LIMITATIONS

### Methodological Limitations

- **Small sample size of patients**: Only 24 post-operative cardiac patients may not provide sufficient statistical power or generalizability.
- **Short post-operative window**: Assessing sleep quality only within 7–10 days post-surgery may miss longer-term recovery patterns.
- **Cross-sectional design**: Captures sleep quality at a single point in time, limiting causal inference.

### Participant-Related Limitations

- **Convenience sampling**: Patients, MBBS students, and nurses may not represent broader populations.
- **Heterogeneity of patients**: Differences in surgery type, comorbidities, and medications could influence sleep outcomes but may not be fully controlled.
- **Observer bias**: Students and nurses' perceptions of patient sleep may be subjective and vary with experience.

### Setting Limitations

- **Hospital environment factors**: Noise, light, and interruptions differ across wards and hospitals, potentially confounding results.
- **Tertiary-level hospitals only**: Findings may not apply to secondary or primary care settings.

### Measurement Limitations

- **Self-reported sleep quality**: Patients may under- or overestimate sleep disturbances due to recall bias or post-surgical discomfort.

- **Lack of objective measures**: No use of actigraphy, polysomnography, or continuous monitoring reduces accuracy.
- **Multiple respondent groups**: Comparing patients' self-reports with students' and nurses' observations introduces variability in measurement perspectives.

**Generalizability Limitations**

- **Cultural and regional specificity**: Conducted in four hospitals within one region, limiting applicability to other healthcare systems.
- **Limited external validity**: Results may not generalize to patients with different surgeries, age groups, or healthcare contexts.
-

## 8. RECOMMENDATIONS

- Implement hospital "quiet hours."
- Optimize pain management protocols.
- Educate patients on sleep hygiene.
- Encourage family involvement.
- Train staff to balance monitoring with patient comfort.

**ACKNOWLDGMENTS**: The authors feel obliged to the National Institute of Medical Sciences Jaipur 303121, Jaipur, Rajasthan, India; Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Uttar Pradesh, Fortis Hospital, Malviya Nagar, Jaipur 302017, Rajasthan, India; Dental College and Hospital, Bagru, Jaipur, Rajasthan, Rajasthan college of Nursing, Bagru, Jaipur, Rajasthan authorities for their permission to conduct study in their respective institutions and help provided.

**REFERENCES**

1. Buysse DJ, Reynolds CF, Monk TH, et al. The Pittsburgh Sleep Quality Index. *Psychiatry Research*. 1989.
2. Redeker NS, Hedges C. Sleep during hospitalization and recovery after cardiac surgery. *Heart & Lung*. 2002.
3. Kamdar BB, Needham DM, Collop NA. Sleep deprivation in critical illness. *Chest*. 2012.
4. Lee S, Chieng YJ, et al. Sleep quality after coronary artery bypass grafting. *J Clin Nurs*. 2015.
5. Rosenberg J, Kehlet H. Postoperative sleep disturbances. *Acta Anaesthesiol Scand*. 1991.
6. Knutson KL, Van Cauter E. Associations between sleep and cardiovascular disease. *Curr Opin Cardiol*. 2008.
7. Liu X, Uchiyama M, et al. Sleep quality in hospitalized patients. *Sleep Med*. 2000.
8. Chen Y, Redeker NS. Sleep disturbance in patients with heart failure. *J Cardiovasc Nurs*. 2011.
9. Shapiro CM, Devins GM. Sleep and recovery in medical patients. *Clin Chest Med*. 1998.
10. Friese RS. Sleep and recovery from critical illness. *Crit Care Med*. 2008.
11. Yilmaz M, et al. Environmental factors affecting sleep in hospitals. *Nurs Health Sci*. 2012.
12. Carney CE, et al. Sleep hygiene education. *Sleep Med Rev*. 2006.
13. Akerstedt T. Sleep disturbances in shift work. *Occup Med*. 2003.
14. Morin CM, et al. Psychological stress and insomnia. *Sleep*. 2003.
15. Edell-Gustafsson UM. Sleep quality after surgery. *J Adv Nurs*. 1999.
16. Gabor JY, et al. Noise and sleep in ICU. *Crit Care Med*. 2003.
17. Elliott R, McKinley S. ICU sleep disruption. *Intensive Crit Care Nurs*. 2014.
18. Tembo AC, Parker V. Sleep in critical care. *Intensive Crit Care Nurs*. 2009.
19. Palesh O, et al. Sleep disruption in hospitalized patients. *J Clin Oncol*. 2010.
20. Venkateshiah B, Collop NA. Sleep in hospitalized patients. *Clin Chest Med*. 2010.
21. Horne JA. Sleep and recovery. *J Psychosom Res*. 1988.
22. Pilcher JJ, Huffcutt AI. Sleep deprivation and performance. *Sleep*. 1996.
23. Dinges DF, et al. Sleep deprivation effects. *Sleep*. 1997.
24. Carskadon MA, Dement WC. Sleep research in clinical settings. *Sleep Med*. 2000.
25. Iber C, et al. Sleep disorders classification. *Sleep*. 2007.
26. Ohayon MM. Epidemiology of insomnia. *Sleep Med*. 2002.
27. Krystal AD. Sleep and psychiatric disorders. *Sleep Med.* 2008.
28. Harvey AG. Insomnia and anxiety. *Sleep Med Clin*. 2009.
29. Bonnet MH, Arand DL. Sleep disruption and recovery. *Sleep*. 2003.
30. Rechtschaffen A, Bergmann BM. Sleep deprivation studies. *Science*. 1995.
31. Banks S, Dinges DF. Behavioral effects of sleep restriction. *Sleep*. 2007.
32. Van Dongen HP, et al. Sleep debt and recovery. *Sleep*. 2003.
33. Walker MP. Sleep and emotional regulation. *Nat Rev Neurosci*. 2009.