

## Fatigue and excessive daytime sleepiness among nurses



Septian Mixrova Sebayang<sup>1</sup>, Made Suandika<sup>1\*</sup>, Ita Apriliyani<sup>2</sup>, Suci Khasanah<sup>2</sup>,  
Asmat Burhan<sup>1</sup>, Noor Yunida Triana<sup>2</sup>, Dwi Astuti<sup>3</sup>

### ABSTRACT

**Background:** Nurses are responsible for ensuring the safety of their patients. It has long been known that weariness and sleepiness can lead to mistakes that jeopardize patient safety. The researchers wanted to see if there was a link between exhaustion and excessive daytime sleepiness among nurses.

**Methods:** The study used a cross-sectional correlational design with 36 nurses from a Tertiary Eye Care Hospital as participants. Convenience sampling was used to collect data. The Epworth Sleepiness Scale (ESS) and the Three-Dimensional Work Fatigue Inventory (3D-WFI) were used to collect data. Pearson's correlation coefficient was used to calculate the correlation between WFI and ESS.

**Results:** The statistical analysis with ratio data between exhaustion and Excessive Daytime Sleepiness, we obtained that  $p < 0.000$  with Pearson correlation and suggests that there is a strong link between fatigue and excessive daytime sleepiness (EDS) among hospital nurses.

**Conclusions:** Fatigue and daytime sleepiness are significant occupational health concerns for hospital nurses. According to this study, nurses should optimize their work hours to avoid daytime sleepiness and maintain circumstances to avoid excessive sleepiness, which can lead to adverse outcomes.

**Keywords:** *fatigue, occupational health, sleepiness.*

**Cite This Article:** Sebayang, S.P., Suandika, M., Apriliyani, I., Khasanah, S., Burhan, A., Triana, N.Y., Astuti, D. 2022. Fatigue and excessive daytime sleepiness among nurses. *Bali Medical Journal* 11(3): 1640-1643. DOI: 10.15562/bmj.v11i3.3746

<sup>1</sup>Department of Anesthesia, Faculty of Health Science, Universitas Harapan Bangsa, Central Java Indonesia;

<sup>2</sup>School of Nursing, Faculty of Health Science, Universitas Harapan Bangsa, Purwokerto;

<sup>3</sup>School of Nursing, Politeknik Yakpermas Banyumas, Central Java Indonesia;

\*Corresponding author:

Made Suandika;  
Department of Anesthesia, Faculty of Health Science, Universitas Harapan Bangsa, Banyumas, Central Java, Indonesia;

[madesuandika@uhb.ac.id](mailto:madesuandika@uhb.ac.id)

Received: 2022-09-17

Accepted: 2022-10-12

Published: 2022-11-15

## INTRODUCTION

Although fatigue is often considered a multidimensional phenomenon, most nursing research has focused mainly on sleep, mental fatigue, emotional exhaustion, and other components and their implications for safety.<sup>1</sup> Nurse weariness caused by poor sleep quality is a healthcare problem that affects nurse performance.<sup>2</sup> Nurses who work shifts are also prone to sleep deprivation weekly. Nurses working day shifts cause them to bite more sleep during the day.<sup>3</sup>

In nursing populations, certain epidemiological studies have investigated the prevalence and correlation of exhaustion, excessive daytime sleepiness (EDS), and other factors<sup>4</sup>, 12-hour working<sup>5</sup>, psychosocial work stressors<sup>6,7</sup>, sleep hours<sup>8</sup>, work shift nurse<sup>9</sup>, burnout with fatigue<sup>10</sup>, and work capacity<sup>11</sup> have all been linked to fatigue in previous studies. Several studies have found links between nurses' cognitive function<sup>12</sup>,

working consecutive 12-hour shifts<sup>13</sup>, performance<sup>14</sup>, medical mistake categories<sup>15</sup>, and excessive daytime drowsiness. As a result, more research on the prevalence of fatigue and EDS in nurses and their correlations with other variables is needed.

Nurses in the present study perceived that the workload they experience is stressful and reduces their energy and strength, which affects their performance in physical and mental care activities. In the long run, nurses further reported fatigue and exhaustion, which reduces their focus and level of concentration when providing care.<sup>16</sup> Individual well-being and curtailed work performance may occur when a high workload results in behaviour changes such as reduced work pace and some occupational diseases, for example, work-related musculoskeletal disorder (WMSDs).<sup>17</sup>

Working is one of the causes of reduced sleep<sup>18</sup> reported that the average sleep

duration in Japanese daytime workers was 6.5 hours. Shift work is one of the largest contributing factors to sleep loss; it causes circadian misalignment,<sup>19</sup> due to a sleep disturbance. Despite negative consequences of sleep loss, there are also adverse consequences of insufficient sleep at work. Sleep loss causes daytime sleepiness, fatigue, and performance impairment in the workplace.<sup>2,20</sup> Short sleep duration has been reported to significantly impair working performance. Because those symptoms potentially result in workplace accidents, obtaining proper sleep is vital for maintaining workers' well-being. Even though irregular and night-time shift work has been the subject of numerous research, it is still unclear what causes daytime workers to sleep less than they should.<sup>21</sup>

On the other hand, fatigue and EDS in hospital nurses is a serious occupational health concern that affects patient safety. However, Indonesian hospital nurses'

relationship between exhaustion and excessive daytime sleepiness (EDS) remains uncertain. Furthermore, most previous research on this topic did not properly control personal characteristics, such as other sleep difficulties<sup>15</sup>, which could result in inconsistent findings between studies. The researchers wanted to see any correlations between exhaustion and excessive daytime sleepiness (EDS) in hospital nurses.

## METHODS

A cross-sectional study was planned and carried out. The author recruited 36 full-time registered nurses with at least one year of experience working in a hospital as a convenience sample. The ratio of the total number of nurses to the number of participants recruited. Between July and August of 2020, data was collected.

Direct questionnaires were given to 36 participants, matching the study's inclusion requirements. The participants were told to fill out the self-administered surveys only once. The completed questionnaires were sent back to the sender. The surveys were created to gather demographic information, weariness, and excessive daytime drowsiness. The demographic factors were age, sex, education level, and work experience. The Epworth Sleepiness Scale and the Three-Dimensional Work Fatigue Inventory (3D-WFI) were used to collect data (ESS). The Three-Dimensional Work Fatigue Inventory was used to assess fatigue (3D-WFI). The 3D-WFI comprises 18 questions, each divided into six packs that assess physical, mental, and emotional work exhaustion. In all three aspects, high scores indicate greater weariness.<sup>22</sup> In a previous study, Cronbach's alpha for physical was 0.880, mental was 0.710, and emotional was 0.848.<sup>23</sup> The Epworth Tiredness Scales (ESS) was created to assess sleepiness in the workplace or during the day.

The ESS questionnaire consists of eight questions about activities that can make you sleepy daily. Each question has a score ranging from 0 (would never doze) to 3 (would never doze) (high chance of dozing). The total score ranges from 0 to 24, with a score of 10 indicating EDS experience.<sup>24</sup> The instrument's test-retest reliability was 0.88 in previous research.<sup>2</sup>

Demographic factors, tiredness, and excessive daytime drowsiness, were all described using descriptive statistics. The Kolmogorov-Smirnov test was used to determine whether the data were normal. Statistical significance was seen through the p-value with a significance limit of 0.05. Pearson's correlation was used to assess for quantitative data.

## RESULTS

Table 1 describe the characteristics of the research sample. Most participants (58.3 percent, n=21) were female and under 30 years old (72.2 percent, n=26). Most of the nurses (88.9%, n=32) had a bachelor's degree in nursing, and 63.9 percent (n=23) had less than five years of experience. 61.1 percent of the participants in this study reported weariness, which was characterized as having 3D-WFI 46. Furthermore, 63.9 percent of nurses said they have EDS, characterized as having ESS 14. We discovered that the distributions of 3D-WFI (0.069) and ESS score (0.064) were normal using a single Kolmogorov-Smirnov test. The negative association between exhaustion and Excessive Daytime Sleepiness ( $r = -0.588$ ,  $p < 0.05$ ) suggests that there is a strong link between fatigue and excessive daytime sleepiness (EDS) among hospital nurses (Table 2).

**Table 1. Demographic characteristic of participants.**

Characteristics	n	(%)
Gender		
Male	15	41.7
Female	21	58.3
Age (years)		
<30	26	72.2
30-38	10	27.8
Level of education		
Bachelor of Nursing	32	88.9
Diploma of Nursing	4	11.1
Work experience (years)		
≤ 5	23	63.9
> 5	13	36.1

**Table 2. Correlation analysis between fatigue and excessive daytime sleepiness (EDS).**

Variable	Category	n (%)	Mean (SD)	p-value
Fatigue	Fatigue	22 (61.1)	49.8 (4.4)	0.000
	Without Fatigue	14 (38.9)		
EDS	EDS	23 (63.9)	12.8 (1.3)	
	Without EDS	13 (36.1)		

SD: Standard Deviation; EDS: Excessive Daytime Sleepiness.

## DISCUSSION

Excessive daytime drowsiness is a complicated issue that requires a delicate balance of sleep and alertness systems. The findings of the various tests established to assess objective and subjective EDS are mixed. The ESS is an eight-item validated questionnaire to assess subjective EDS.<sup>24</sup> Because it is simple to administer, it has been widely utilized for screening and epidemiologic purposes. However, the prevalence rates of EDS, as determined by ESS ranged from 0.75 percent to 46 percent (ESS > 10).

The nurses participating in this research were exhausted and drowsy during the day. The findings align with those of earlier studies conducted in other nations.<sup>2</sup> discovered that Thai nurses had a moderate degree of exhaustion (four points) and high daytime sleepiness (ten points). Nurses in the United States also report significant levels of exhaustion, including mental exhaustion.<sup>1</sup> Over one-third of nurses in research reported a significant level of exhaustion, with inter-shift fatigue being the most common. In addition, the author stated that fatigue resulted from insufficient sleep following labour, which has been shown to impede recovery from physical and cognitive exhaustion.

EDS was reported by 63.9 percent of nurses in the current study. Low work-related interest was linked to the occurrence of EDS, although there were no significant links between educational level and EDS. EDS was found to be a risk factor for negative outcomes. The prevalence of EDS in the current survey was relatively high (63.9%)<sup>25</sup> when compared to previously published data on nursing populations in Indonesia (48%), United States (25.7%)<sup>26</sup>, and Japan (26%).<sup>27</sup> Prior studies' comparatively low prevalence of EDS could be due to several causes. To begin, we used a different threshold to define EDS (ESS scores of 14) than the study on Japanese nurses. Second, the Indonesian subjects were substantially younger than those in our study. Sleep deprivation has been reported to cause more neurobehavioral impairments in the younger population.<sup>28</sup>

Excessive daytime drowsiness was linked to fatigue in this study. Our findings are in line with those of some earlier research. At the time, one-fourth of nurses were experiencing excessive daytime sleepiness as well as episodic inter-shift weariness.<sup>9</sup> Others have reported on the impact of exhaustion and excessive daytime sleepiness on critical care nurses' clinical performance and patient outcomes.<sup>5</sup>

Furthermore, lacking control over scheduling enhances workplace stress and physical fatigue, which might lead to significant nursing errors.<sup>29</sup> Concern over the adverse effects of working shifts weariness, potential health risks for nurses, and the quality of patient outcomes raised across the profession.<sup>30</sup> It is also the collaborative responsibility of nurses and health care managers to promote sleep quality in the management systems that coordinate nurses' professional and personal lives.<sup>31</sup> One of factors that were found to significantly influence changes in ESS score was the length of work shifts.<sup>26</sup> Shorter shifts should be used instead of shifts longer than 12 hours, especially at night when nurses face potential challenges with sleep and staying up all night.<sup>32</sup>

When presenting the research findings, the current study has two limitations. To begin with, the Epworth Drowsiness

Scale (ESS) has a moderate relationship with objective daytime sleepiness as determined by several sleep latency tests.<sup>24</sup> It should also be noted that the method of self-reported weariness is a weakness in this study. Nurses who are sleepier are more likely to remember the exhaustion occurrences. Second, because our sample consisted of only fifty nurses from a single hospital, the results cannot be generalized to all Indonesian general hospital nurses.

## CONCLUSIONS

In conclusion, nurses' exhaustion and excessive daytime sleepiness are serious health and work-related issues. In Indonesian nurses, fatigue causes daytime drowsiness. Working exhaustion was linked to excessive daytime drowsiness in a statistically significant way. According to hospital standards, nurses should be able to get enough rest after work. Registered nurses and their organizations must collaborate to reduce the risks of nurse fatigue and sleepiness associated with shift work and long work hours. Rest may help to reduce excessive daytime sleepiness, exhaustion, and unpleasant effects. Our data indicated that exhaustion was common among Indonesian nurses and linked to excessive daytime drowsiness (EDS). Furthermore, individuals and medical professionals are worried about developing preventative measures to avoid bad outcomes (AEs).

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

## ETHIC STATEMENT

The Research Ethics Committee of the Faculty of Nursing at North Sumatera University granted clearance for the study, with approval number 2220/IX/SP/2020, stating that the study is ethical.

## AUTHOR CONTRIBUTIONS

Conceived and designed the research: SMS MS AB. Analysed the data: IA SK. Contributed reagents/materials/analysis tools: SMS MS AB. Wrote the paper: NYT DA. Thorough revision of the manuscript: SMS MS AB.

## ACKNOWLEDGEMENT

The author wishes to express his gratitude to the study participants for their time and commitment to the research.

## REFERENCES

- Barker LM, Nussbaum MA. Fatigue, performance and the work environment: a survey of registered nurses: Fatigue, performance and the work environment. *Journal of Advanced Nursing* [Internet]. 2011 Jun [cited 2022 Oct 4];67(6):1370–82. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2648.2010.05597.x>
- Chaiard J, Deeluea J, Suksatit B, Songkham W, Inta N. Short sleep duration among Thai nurses: Influences on fatigue, daytime sleepiness, and occupational errors. *Jrnl of Occup Health* [Internet]. 2018 Sep [cited 2022 Oct 4];60(5):348–55. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1539/joh.2017-0258-OA>
- Roodbandi ASJ, Feyzi V, Khanjani N, Moghadam SR, Bafghi MS, Moghadasi M, et al. Sleep Quality and Sleepiness: A Comparison between Nurses with and without Shift Work, and University Employees. 2016;7.
- Chen L, Luo C, Liu S, Chen W, Liu Y, Li Y, et al. Excessive daytime sleepiness in general hospital nurses: prevalence, correlates, and its association with adverse events. *Sleep Breath* [Internet]. 2019 Mar [cited 2022 Oct 4];23(1):209–16. Available from: <http://link.springer.com/10.1007/s11325-018-1684-9>
- Scott LD, Arslanian-Engoren C, Engoren MC. Association of Sleep and Fatigue With Decision Regret Among Critical Care Nurses. *American Journal of Critical Care* [Internet]. 2014 Jan 1 [cited 2022 Oct 4];23(1):13–23. Available from: <https://aacnjournals.org/ajconline/article/23/1/13/3863/Association-of-Sleep-and-Fatigue-With-Decision>
- Kusnanto K, Rohmah FA, Wahyudi AS, Arifin H. Mental Workload and Stress with Blood Glucose Level: A Correlational Study among Lecturers who are Structural Officers at the University. *Systematic Reviews in Pharmacy*. 2020;11(7):5.
- Rahman HA, Abdul-Mumin K, Naing L. A study into psychosocial factors as predictors of work-related fatigue. *Br J Nurs* [Internet]. 2016 Jul 14 [cited 2022 Oct 4];25(13):757–63. Available from: <http://www.magonlineibrary.com/doi/10.12968/bjon.2016.25.13.757>
- Saleh AM, Awadalla NJ, El-masri YM, Sleem WF. Impacts of nurses' circadian rhythm sleep disorders, fatigue, and depression on medication administration errors. *Egyptian Journal of Chest Diseases and Tuberculosis* [Internet]. 2014 Jan [cited 2022 Oct 4];63(1):145–53. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0422763813002380>
- Han K, Trinkoff AM, Geiger-Brown J. Factors Associated with Work-Related Fatigue and Recovery in Hospital Nurses Working 12-Hour Shifts. *Workplace Health Saf* [Internet].

- 2014 Oct [cited 2022 Oct 4];62(10):409–14. Available from: <http://journals.sagepub.com/doi/10.3928/21650799-20140826-01>
10. Raftopoulos V, Charalambous A, Talias M. The factors associated with the burnout syndrome and fatigue in Cypriot nurses: a census report. *BMC Public Health* [Internet]. 2012 Dec [cited 2022 Oct 4];12(1):457. Available from: <https://bmcpublihealth.biomedcentral.com/articles/10.1186/1471-2458-12-457>
  11. da Silva FJ, Felli VEA, Martinez MC, Mininel VA, Ratier APP. Association between work ability and fatigue in Brazilian nursing workers. *WOR* [Internet]. 2016 Jan 27 [cited 2022 Oct 4];53(1):225–32. Available from: <https://www.medra.org/servelet/aliasResolver?alias=iopress&doi=10.3233/WOR-152241>
  12. Kaliyaperumal D. Effects of Sleep Deprivation on the Cognitive Performance of Nurses Working in Shift. *JCDR* [Internet]. 2017 [cited 2022 Oct 4]; Available from: [http://jcdr.net/article\\_fulltext.asp?issn=0973-709x&year=2017&volume=11&issue=8&page=CC01&issn=0973-709x&id=10324](http://jcdr.net/article_fulltext.asp?issn=0973-709x&year=2017&volume=11&issue=8&page=CC01&issn=0973-709x&id=10324)
  13. Geiger-Brown J, Rogers VE, Trinkoff AM, Kane RL, Bausell RB, Scharf SM. Sleep, Sleepiness, Fatigue, and Performance of 12-Hour-Shift Nurses. *Chronobiology International* [Internet]. 2012 Mar [cited 2022 Oct 4];29(2):211–9. Available from: <http://www.tandfonline.com/doi/full/10.3109/07420528.2011.645752>
  14. Wilson M, Permito R, English A, Albritton S, Coogler C, Van Dongen HPA. Performance and sleepiness in nurses working 12-h day shifts or night shifts in a community hospital. *Accident Analysis & Prevention* [Internet]. 2019 May [cited 2022 Oct 4];126:43–6. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0001457517303536>
  15. Suzuki K, Ohida T, Kaneita Y, Yokoyama E, Uchiyama M. Daytime sleepiness, sleep habits and occupational accidents among hospital nurses. *J Adv Nurs* [Internet]. 2005 Nov [cited 2022 Oct 4];52(4):445–53. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2648.2005.03610.x>
  16. Banda Z, Simbota M, Mula C. Nurses' perceptions on the effects of high nursing workload on patient care in an intensive care unit of a referral hospital in Malawi: a qualitative study. *BMC Nurs* [Internet]. 2022 Dec [cited 2022 Oct 4];21(1):136. Available from: <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-022-00918-x>
  17. Lin SC, Lin LL, Liu CJ, Fang CK, Lin MH. Exploring the factors affecting musculoskeletal disorders risk among hospital nurses. *Noll M, editor. PLoS ONE* [Internet]. 2020 Apr 16 [cited 2022 Oct 4];15(4):e0231319. Available from: <https://dx.plos.org/10.1371/journal.pone.0231319>
  18. Ikeda H, Kubo T, Sasaki T, Liu X, Matsuo T, So R, et al. Cross-sectional Internet-based survey of Japanese permanent daytime workers' sleep and daily rest periods. *Jrnl of Occup Health* [Internet]. 2018 May [cited 2022 Oct 4];60(3):229–35. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1539/joh.17-0165-OA>
  19. Mlynarska A, Bronder M, Kolarczyk E, Manulik S, Mlynarski R. Determinants of Sleep Disorders and Occupational Burnout among Nurses: A Cross-Sectional Study. *IJERPH* [Internet]. 2022 May 20 [cited 2022 Oct 4];19(10):6218. Available from: <https://www.mdpi.com/1660-4601/19/10/6218>
  20. Vanttola P, Härmä M, Viitasalo K, Hublin C, Virkkala J, Sallinen M, et al. Sleep and alertness in shift work disorder: findings of a field study. *Int Arch Occup Environ Health* [Internet]. 2019 May [cited 2022 Oct 4];92(4):523–33. Available from: <http://link.springer.com/10.1007/s00420-018-1386-4>
  21. St Hilaire MA, Anderson C, Anwar J, Sullivan JP, Cade BE, Flynn-Evans EE, et al. Brief (<4 hr) sleep episodes are insufficient for restoring performance in first-year resident physicians working overnight extended-duration work shifts. *Sleep* [Internet]. 2019 May 1 [cited 2022 Oct 4];42(5):zsz041. Available from: <https://academic.oup.com/sleep/article/doi/10.1093/sleep/zsz041/5362587>
  22. Frone MR, Tidwell MCO. The meaning and measurement of work fatigue: Development and evaluation of the Three-Dimensional Work Fatigue Inventory (3D-WFI). *Journal of Occupational Health Psychology* [Internet]. 2015 Jul [cited 2022 Oct 4];20(3):273–88. Available from: <http://doi.apa.org/getdoi.cfm?doi=10.1037/a0038700>
  23. Rahme D, Lahoud N, Sacre H, Akel M, Hallit S, Salameh P. Work fatigue among Lebanese community pharmacists: prevalence and correlates. *Pharm Pract (Granada)* [Internet]. 2020 Jun 3 [cited 2022 Oct 4];18(2):1844. Available from: <https://www.pharmacypractice.org/index.php/pp/article/view/1844>
  24. Johns MW. A New Method for Measuring Daytime Sleepiness: The Epworth Sleepiness Scale. *Sleep* [Internet]. 1991 Nov 1 [cited 2022 Oct 4];14(6):540–5. Available from: <http://academic.oup.com/sleep/article/14/6/540/2742871>
  25. Bambangafira D, Nuraini T. KEJADIAN EXCESSIVE DAYTIME SLEEPINESS (EDS) DAN KUALITAS TIDUR PADA MAHASISWA KESEHATAN. *Jurnal Keperawatan Indonesia* [Internet]. 2017 Jul 11 [cited 2022 Oct 4];20(2):94–101. Available from: <http://jki.ui.ac.id/index.php/jki/article/view/365>
  26. Arbour M, Tanner T, Hensley J, Beardsley J, Wika J, Garvan C. Factors That Contribute to Excessive Sleepiness in Midwives Practicing in the United States. *Journal of Midwifery & Women's Health* [Internet]. 2019 Mar [cited 2022 Oct 4];64(2):179–85. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/jmwh.12945>
  27. Furihata R, Saitoh K, Suzuki M, Jike M, Kaneita Y, Ohida T, et al. A composite measure of sleep health is associated with symptoms of depression among Japanese female hospital nurses. *Comprehensive Psychiatry* [Internet]. 2020 Feb [cited 2022 Oct 4];97:152151. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0010440X19300744>
  28. Duffy JF, Willson HJ, Wang W, Czeisler CA. Healthy Older Adults Better Tolerate Sleep Deprivation Than Young Adults: INCREASED TOLERANCE OF SLEEP DEPRIVATION WITH AGE. *Journal of the American Geriatrics Society* [Internet]. 2009 Jul [cited 2022 Oct 4];57(7):1245–51. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/j.1532-5415.2009.02303.x>
  29. Sadeghniaat-Haghighi K, Najafi A, Eftekhari S, Tarkhan S. Insomnia and its association with absenteeism: A cross-sectional study among Iranian nursing team. *SS* [Internet]. 2021 [cited 2022 Oct 4];14(4). Available from: <https://sleepscience.org.br/details/3092/en-US/insomnia-and-its-association-with-absenteeism--a-cross-sectional-study-among-iranian-nursing-team>
  30. Al-Abdallah AM, Malak MZ. Factors correlating with prolonged fatigue among emergency department nurses. *Journal of Research in Nursing* [Internet]. 2019 Dec [cited 2022 Oct 4];24(8):571–84. Available from: <http://journals.sagepub.com/doi/10.1177/1744987119880309>
  31. Caruso CC, Baldwin CM, Berger A, Chasens ER, Edmonson JC, Gobel BH, et al. Policy brief: Nurse fatigue, sleep, and health, and ensuring patient and public safety. *Nursing Outlook* [Internet]. 2019 Sep [cited 2022 Oct 4];67(5):615–9. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0029655419305007>
  32. Blytt KM, Bjorvatn B, Moen BE, Pallesen S, Harris A, Waage S. The association between shift work disorder and turnover intention among nurses. *BMC Nurs* [Internet]. 2022 Dec [cited 2022 Oct 4];21(1):143. Available from: <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-022-00928-9>



This work is licensed under a Creative Commons Attribution