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Between Pillows and Patients: A Midnight Journey into the Sleep of Shift Nurses

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Abstract
Poor sleep quality is highly prevalent among shift-working nurses, impairing health, work performance, and patient care. This cross-sectional study assessed sleep quality among 544 nurses in a Malaysian public hospital using the validated Malay Pittsburgh Sleep Quality Index (PSQI-M). Results showed that 68.9% of nurses reported poor sleep quality. Significant differences emerged by age, work experience, health status, and shift satisfaction. These findings underscore the urgent need for organizational interventions, such as shift rescheduling and sleep health programs, to improve nurses' well-being and care quality.

Keywords: Sleep Quality; Shift Work; Nurses

DOI:

1.0 Introduction

Sleep is a core component of human health, crucial for physical restoration, emotional regulation, and cognitive functioning. Nurses, as frontliners of healthcare systems, are particularly vulnerable to sleep disturbances due to demanding workloads, unpredictable shift patterns, and extended working hours (Chang & Peng, 2021). Shift work defined as employment outside the conventional 8 a.m. to 5 p.m. schedule, including night rotations and split shifts directly disrupts the circadian rhythm, leading to chronic sleep deprivation and fatigue (Sooriyaarachchi et al., 2022). Such disruptions are not merely a personal inconvenience but have profound implications for workplace safety, clinical decision-making, and patient outcomes.

In Malaysia, nurses often endure some of the region's longest working hours, frequently exceeding 40–45 hours per week (Jayasingam et al., 2023). Recent local studies underscore the severity of the issue, reporting that between 69.8% and 86.8% of Malaysian healthcare workers, particularly nurses, experience poor sleep quality (Supian & Ibrahim, 2024). International comparisons reveal similarly concerning trends. Like examples, 72% among Chinese nurses (Wang et al., 2020), and 75.5% among Ethiopian nurses (Segon et al., 2022). Despite these alarming figures, limited research in Malaysia has systematically examined the specific patterns,

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severity, and determinants of poor sleep among shift-working nurses. This study aims to fill this gap by assessing the prevalence and key components of sleep disturbances in a Malaysian public hospital, providing evidence-based insights to guide institutional interventions.

2.0 Literature Review:

Sleep quality is a multidimensional concept encompassing subjective satisfaction, sleep latency, duration, efficiency, disturbances, and daytime dysfunction (Farah et al., 2019). The Pittsburgh Sleep Quality Index (PSQI), widely validated across populations, remains the gold standard for assessing these domains. Numerous international studies highlight the heightened vulnerability of nurses to sleep disruptions, with shift work emerging as a consistent predictor (Zeng et al., 2020). Research by Abbas Gawad et al. (2022) and Mansouri et al. (2025) further confirms that rotating shifts and long work hours significantly degrade both sleep quality and professional quality of life.

Malaysian-specific evidence points to concerning trends: Roslan et al. (2021) demonstrated associations between poor sleep and emotional exhaustion, while Marzo et al. (2022) identified long shifts (>10 hours/day) as predictors of psychological distress among nurses. Factors such as younger age, shorter work experience, and dissatisfaction with shift schedules have also been implicated in worsening sleep outcomes (Mohamud et al., 2025). Despite this, few studies have systematically mapped how these variables interact within Malaysia's unique public healthcare context.

Addressing poor sleep quality is not merely a matter of individual health but a critical institutional priority. Impaired sleep-in nurses correlate strongly with higher rates of medical errors, reduced patient safety, and elevated staff turnover (Miguez-Torres et al., 2021). By providing localized, empirical insights, this study contributes to the foundational understanding needed to develop targeted organizational strategies, such as optimized shift planning, workplace fatigue management, and sleep hygiene programs that can protect both nurse well-being and healthcare quality.

3.0 Materials and Methods

3.1 Study Design

This quantitative cross-sectional study assessed sleep quality among shift-working nurses in a public hospital and identified key factors associated with sleep disturbances. The design was chosen for its efficiency in capturing prevalence and examining potential predictors within the target population at a single point in time.

3.2 Study Setting

The research was conducted at a major public hospital in Kuala Lumpur, which functions as a leading referral center for secondary and tertiary healthcare services. This site was selected as it reflects the typical shift-working environment of Malaysian public hospitals, thereby providing access to a representative sample of shift nurses.

3.3 Population and Sampling

The study targeted nurses engaged in night, evening, or rotating shifts, as these groups are particularly susceptible to sleep disturbances stemming from irregular work schedules. A total of 544 nurses were recruited through convenience sampling, selected for its practicality and ease of access. Eligible participants were registered nurses aged between 21 and 60 years, with a minimum of six months of shift work experience to ensure sufficient exposure to shift-related conditions. A complete response rate (100%) was achieved, as all invited participants completed the online survey distributed via Google Forms by the respective head nurses and matrons.

3.4 Study Instrument

The data for this study were gathered using a structured questionnaire comprising two main sections. Section A focused on collecting respondents' sociodemographic details, such as age, gender, length of work experience, marital status, general health condition, type of work shift, and level of job satisfaction. Section B employed the validated Malay version of the Pittsburgh Sleep Quality Index (PSQI-M), which was initially developed by Buysse et al. (1989) and subsequently adapted for use among the Malaysian population by Farah et al. (2019). Prior to data collection, formal permission to use the PSQI-M was secured through email correspondence with by Farah et al. (2019). The PSQI-M consists of 19 items that assess seven key domains of sleep: perceived sleep quality, time taken to fall asleep (latency), total sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime functional impairment. Each domain is scored from 0 to 3, contributing to a global score ranging from 0 to 21, with scores of 5 or above indicating poor sleep quality.

This study focused on the global PSQI score to assess overall sleep quality, as the primary objective was to determine prevalence and associated demographic factors rather than to analyze individual subscale components. While the PSQI provides

detailed subscale data, these were beyond the scope of the current study, which aimed for a broad occupational health perspective relevant to organizational interventions.

A pilot study conducted with 20 nurses outside the main sample yielded a Cronbach's alpha of 0.70, demonstrating acceptable internal consistency. This result aligns with previous studies, who reported a Cronbach's alpha of >0.80 for the PSQI, further supporting the instrument's reliability for assessing sleep quality (Supian & Ibrahim, 2024).

3.5 Data Collection Procedure and Data Analysis

The questionnaire was distributed both manually and digitally via Google Form by the head nurse and matron to the selected nursing staff. Prior to completion, all participants received a detailed briefing on the study objectives, procedures, and their rights as respondents. Written informed consent was obtained, and strict confidentiality of all data was maintained. Data collection spanned two months, during which all completed questionnaires were checked for completeness and accuracy.

Data were analyzed using SPSS version 27. Descriptive statistics were employed to summarize sociodemographic characteristics and sleep quality levels. Inferential analyses, including chi-square tests and one-way ANOVA, were conducted to examine significant differences between sociodemographic factors and sleep quality levels. A p-value of <0.05 was considered statistically significant.

3.6 Ethical Considerations

This study received ethical approval from the National Medical Research Register (NMRR) with reference number RSCH ID-24-00394-0HA. Additional approval was obtained from the Malaysian Research Ethics Committee (MREC) with references number: NMRR ID-24-00365-8YS (IIR) and the hospital's administrative management with references number: CRCHKL-2024-01-023. All participants were fully informed of the study details, including their right to withdraw at any time without consequence. Collected data were securely stored and accessible only to the principal investigator, and all records will be destroyed following study completion to ensure participant confidentiality.

4.0 Results

4.1 Socio-demographic Characteristics

Table 1 summarizes the socio-demographic characteristics of the respondents (n = 544). The majority were female (n = 486, 89.3%) with an average age of 35.2 years. Most held a Diploma (n = 377, 69.3%), were married (n = 386, 71.0%), and identified as Malay (n = 444, 81.6%). In terms of job role, the largest group were Nurses U5 (n = 408, 75.0%) working under three rotating shifts (n = 454, 83.5%). Most reported no health problems (n = 401, 73.7%) and felt neutral about shift work (n = 238 43.8%).

Table 1: Socio-demographic (n=544)

Socio-demographic variables	n	%
Gender		
Male	60	11.0
Female	484	89.0
Ages (years)		
Min-max= 23-59	*35.23	**7.09
Work experiences (years)		
Min-max= 1-34	*10.54	**7.60
Level of education		
Diploma	377	69.3
Post basic/ Advanced diploma	139	25.6
Degree/Master/PhD	28	5.1
Marital status		
Single	140	25.7
Married	386	71.0
Divorced/widow	18	3.3
Have children		
No	211	38.8
Yes	333	61.2
Race		
Malay	444	81.6
Chinese	10	1.8
India	18	3.3
Sabah/Sarawak	67	12.3
Others	5	0.9
Position		
Nurses U5	408	75.0
Senior nurses U6	136	25.0
Type of shift		
Three rotations (7am-2pm-9pm)	454	83.5
Others	90	16.5
Current health		
Not sure/Don't know	45	8.3

Having non-communicable disease (NCD)	98	18.0
No health problems	401	73.7
Perception satisfaction towards shift work		
Very Dissatisfied	18	3.3
Dissatisfied	35	6.4
Neutral	238	43.8
Satisfied	190	34.9
Very Satisfied	63	11.6
Very Dissatisfied	18	3.3

Notes: *Mean; **SD

4.2 Sleep Quality Levels Among Nurses

The respondents' global PSQI scores an average score of 1.69 (SD = 0.46). Based on the established cut-off point (PSQI ≥ 5 indicating poor sleep quality), 375 participants (68.9%) were identified as having poor sleep quality, while only 169 participants (31.1%) were categorized as having good sleep quality (PSQI < 5).

Table 2: Summary of PSQI Scores and Sleep Quality Levels (n=544)

Variables	Mean (SD)	Level of PSQI, n (%)	
		Good (<5)	Poor (>5)
PSQI	1.69 (0.46)	169 (31.1)	375 (68.9)

4.3 Sociodemographic Differences in Sleep Quality Among Nurses

Table 3 shows that 78.3% of male respondents and 67.8% of female respondents reported poor sleep quality, though the difference was not significant (p = 0.095). Age (p < 0.001) and work experience (p < 0.001) were significantly associated with poor sleep, with older and more experienced nurses showing higher poor sleep rates. Education level (p = 0.280) and marital status (p = 0.252) were not significantly related to sleep quality, though diploma holders and married respondents showed higher poor sleep prevalence. Having children was significantly linked to better sleep (p = 0.010). No significant differences were found across ethnicities (p = 0.348). Shift type was strongly associated with sleep quality (p < 0.001), with those on rotating shifts reporting worse sleep compared to other shift nurses. Health status (p = 0.023) and satisfaction with shift work (p < 0.001) were also significantly associated, with dissatisfied and unhealthy respondents showing the poorest sleep outcomes.

Table 3: Difference Between Socio-Demographic Variables and Sleep Quality Levels (n=544)

Socio-demographic variables	n (%)	Level of PSQI		*p-value*
		Good	Poor	
Gender				*0.095* [b]
Male	60 (11.0)	13 (21.7)	47 (78.3)	
Female	484 (89.0)	156 (32.2)	328 (67.8)	
Ages (years)				***<0.001*** [a]
Min-max= 23-59	*35.23 (7.09)	*37.33 (8.14)	*34.28 (6.34)	
Work experiences (years)				***<0.001*** [a]
Min-max= 1-34	*10.54 (7.60)	*12.94 (8.58)	*9.46 (6.86)	
Level of education				*0.280* [b]
Diploma	377 (69.3)	111 (29.4)	266 (70.6)	
Post basic/ Advanced diploma	139 (25.6)	46 (33.1)	93 (66.9)	
Degree/Master/PhD	28 (5.1)	12 (42.9)	16 (57.1)	
Marital status				*0.252* [b]
Single	140 (25.7)	36 (25.7)	104 (74.3)	
Married	386 (71.0)	128 (33.2)	258 (66.8)	
Divorced/widow	18 (3.3)	5 (27.8)	13 (72.2)	
Have children				***0.010*** [b]
No	211 (38.8)	52 (24.6)	159 (75.4)	
Yes	333 (61.2)	117 (35.1)	216 (64.9)	
Race				*0.348* [b]
Malay	444 (81.6)	145 (32.7)	299 (67.3)	
Chinese	10 (1.8)	1 (10.0)	9 (90.0)	
India	18 (3.3)	4 (22.2)	14 (77.8)	
Sabah/Sarawak	67 (12.3)	17 (25.4)	50 (74.6)	
Others	5 (0.9)	2 (40.0)	3 (60.0)	
Type of shift				***<0.001*** [b]
Three rotations (7am-2pm-9pm)	408 (75.0)	122 (26.9)	332 (73.1)	
Others	136 (25.0)	47 (52.2)	43 (47.8)	
Current health				***0.023*** [b]
Not sure/Don't know	45 (8.3)	7 (15.6)	38 (84.4)	
Having non-communicable disease (NCD)	98 (18.0)	26 (26.5)	72 (73.5)	
No health problems	401 (73.7)	136 (33.9)	265 (66.1)	
Perception satisfaction towards shift work				***<0.001*** [b]
Very Dissatisfied	18 (3.3)	5 (27.8)	13 (72.2)	
Dissatisfied	35 (6.4)	3 (8.6)	32 (91.4)	

Neutral	238 (238)	63 (26.5)	175 (73.5)
Satisfied	190 (34.9)	77 (40.5)	113 (59.5)
Very Satisfied	63 (3.3)	21 (33.3)	42 (66.7)

Notes: *Mean (SD); Independent t-test [a] ; Chi-square [b]; ***Significant p-value <0.05***

5.0 Discussion

5.1 Overall Level of Sleep Quality Among Shift-Working Nurses

This study found that nearly two-thirds of shift-working nurses reported poor sleep quality based on the PSQI, highlighting a serious occupational health concern. This finding is consistent with prior Malaysian studies, such as Supian and Ibrahim, (2024), who reported over 70% poor sleep prevalence among healthcare workers, and with international studies like Wang et al. (2020) in China and Segon et al. (2022) in Ethiopia, both reporting similarly high rates. These consistent patterns indicate that sleep disturbances among nurses are not isolated to any single region or system but reflect the widespread impact of shift work, especially night and rotating shifts. This aligns with circadian rhythm disruption theory, which explains how irregular schedules disrupt the body's biological clock, impairing natural sleep regulation.

Interestingly, although most nurses reported short sleep durations and difficulties falling asleep, similar to what Mansouri et al. (2025) found, the majority still maintained good sleep efficiency and minimal daytime dysfunction. Moreover, the very low use of sleep medication among respondents reflects cultural patterns seen in Southeast Asia, contrasting with Western studies like Zeng et al. (2020), which reported higher use of pharmacological sleep aids among nurses. This indicates that cultural norms and healthcare access shape how workers manage sleep disturbances.

5.2 Sociodemographic Influences on Sleep Quality Among Shift Nurses

Several sociodemographic factors in this study showed significant associations with sleep quality, while others did not. Age and work experience emerged as significant predictors of poor sleep, with older and more experienced nurses more likely to report disturbances. This finding supports results from Abbas Gawad et al. (2022) and Mohamud et al. (2025), who emphasized the cumulative effects of occupational fatigue, increased responsibilities, and age-related physiological changes on sleep vulnerability. Together, these studies suggest the need for organizational strategies that account for career stage and age differences when designing schedules and interventions.

Notably, marital status showed no significant association with sleep quality, consistent with Marzo et al. (2022), who argued that workplace stressors exert a stronger influence on sleep than personal background. However, having children was associated with slightly better sleep quality in this study, which contrasts with Roslan et al. (2021), who reported that parental responsibilities often compromise sleep. It is possible that, in the Malaysian context, nurses with children benefit from stronger social support or develop better time management routines, though this was not directly measured in the current study.

Education level was not significantly associated with sleep quality, consistent with Jayasingam et al. (2023), who found that workload and shift patterns, rather than academic background, drive sleep outcomes in nursing populations. Ethnic background also showed no significant effect, mirroring findings that occupational stress transcends cultural or ethnic differences. However, small subgroup sizes limit detailed interpretation, highlighting the need for larger, multi-site samples in future research.

Shift type emerged as one of the strongest predictors of poor sleep, with nurses on rotating shifts reporting substantially worse sleep than those working fixed office hours. This finding reinforces the robust evidence base from Chang and Peng, (2021), who found that rotating shifts disrupt biological rhythms, reduce recovery time, and increase chronic sleep deprivation. These results underscore the urgency of evaluating hospital shift systems to protect staff well-being.

Health status was also significantly linked to sleep quality. Nurses reporting no health problems had better sleep compared to those with non-communicable diseases or uncertain health conditions. This supports the bidirectional relationship described by Lim et al. (2020), where chronic illness and poor sleep reinforce each other, creating a cycle of deteriorating health.

Lastly, satisfaction with shift work was a strong predictor of sleep outcomes, echoing Miguez-Torres et al. (2021), who found that subjective satisfaction and perceived control over work schedules can buffer the negative effects of shift work. Dissatisfaction may increase psychological stress, pre-sleep anxiety, and poor sleep hygiene, compounding the physiological challenges of working irregular hours.

5.3 Implications and Contributions to Knowledge

The findings of this study not only confirm patterns identified in prior research but also offer unique insights within the local Malaysian context. For instance, the potential protective role of having children against poor sleep is a rare finding that warrants further investigation. Additionally, the study highlights the importance of addressing systemic issues beyond the individual level, such as optimizing shift schedules, promoting sleep hygiene education, and providing mental health support for nursing staff. These implications extend beyond the immediate study, calling for organizational and policy-level interventions to safeguard nurses' sleep health.

Furthermore, the study enriches the regional literature by providing local data that can be compared with international studies, thereby enhancing the global understanding of how demographic, occupational, and cultural factors interact to shape sleep quality

among healthcare workers. Addressing these complex relationships is essential for designing tailored interventions that improve not only the well-being of nurses but also the quality of care delivered within healthcare systems.

6.0 Conclusion and Recommendation

In conclusion, this study confirmed that poor sleep quality is highly prevalent among shift-working nurses, with significant associations found between sleep outcomes and factors such as age, work experience, shift type, health status, and job satisfaction, reinforcing patterns observed in previous local and international research. However, the study's cross-sectional design limits causal interpretations, and the use of self-reported measures may introduce recall or social desirability bias; additionally, the single-hospital setting restricts the generalizability of findings to broader nursing populations. Future research should employ multi-centre and longitudinal designs, incorporating both subjective and objective sleep assessments (such as actigraphy), and explore additional variables such as family support, cultural influences, coping strategies, and workplace interventions to develop more comprehensive, targeted approaches that enhance nurses' sleep health and overall well-being. Additionally, future studies may consider employing mixed-method or qualitative designs to gain deeper insights into nurses lived experiences and coping strategies in managing sleep disturbances. The integration of objective measurement tools such as actigraphy or wearable sleep trackers could complement self-reported data, reducing bias and enhancing the robustness of findings.

Contribution to the Related Field of Study

This study makes an important contribution to the field of occupational health and nursing science by providing empirical evidence on the high prevalence of poor sleep quality among shift-working nurses within a Malaysian public hospital context, an area that has been underexplored in local research. By identifying significant sociodemographic and occupational predictors, such as age, work experience, shift type, health status, and job satisfaction, the study enhances current understanding of the multifactorial nature of sleep disturbances in healthcare settings. Furthermore, the findings support and extend international literature by offering culturally specific insights, emphasizing the importance of developing targeted institutional interventions and policy reforms to improve nurses' sleep health and well-being. These contributions are relevant not only for advancing academic discourse but also for informing practical improvements in workforce management, patient safety, and healthcare system resilience.

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Conflict of Interest

The authors hereby declare that there are no conflicts of interest, whether financial, professional, or personal, that could have influenced the conduct, analysis, or reporting of this study. All research activities were carried out with academic integrity and independence.

References

Abbas Gawad, S., Fathy Saad, N., & Ali Hassan, H. (2022). Work Place Incivility and its Effect on Quality of Work Life among Staff Nurses. Egyptian Journal of Health Care, 13(3), 809–821. https://doi.org/10.21608/ejhc.2022.255400

Chang, W. P., & Peng, Y. X. (2021). Influence of rotating shifts and fixed night shifts on sleep quality of nurses of different ages: a systematic literature review and meta-analysis. Chronobiology International, 38(10), 1384–1396. https://doi.org/10.1080/07420528.2021.1931273

Farah, N. M. F., Yee, T. S., & Rasdi, H. F. M. (2019). Self-reported sleep quality using the malay version of the pittsburgh sleep quality index (PSQI-M) in Malaysian adults. International Journal of Environmental Research and Public Health, 16(23), 1–10. https://doi.org/10.3390/ijerph16234750

Jayasingam, S., Lee, S. T., & Mohd Zain, K. N. (2023). Demystifying the life domain in work-life balance: A Malaysian perspective. Current Psychology, 42(1), 1–12. https://doi.org/10.1007/s12144-021-01403-5

Lim, Y. C., Hoe, V. C. W., Darus, A., & Bhoo-Pathy, N. (2020). Association between night-shift work, sleep quality and health-related quality of life: A cross-sectional study among manufacturing workers in a middle-income setting. BMJ Open, 10(9), 1–8. https://doi.org/10.1136/bmjopen-2019-034455

Mansouri, P., Rivaz, M., Soltani, R., & Tabei, P. (2025). The relationship between professional quality of life and sleep quality among nurses working in intensive care units: a cross-sectional study. BMC Nursing, 24(1). https://doi.org/10.1186/s12912-025-02693-x

Marzo, R. R., Khaled, Y., ElSherif, M., Abdullah, M. S. A. M. Bin, Zhu Thew, H., Chong, C., Soh, S. Y., Siau, C. S., Chauhan, S., & Lin, Y. (2022). Burnout, resilience and the quality of life among Malaysian healthcare workers during the COVID-19 pandemic. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.1021497

Miguez-Torres, N., Martínez-Rodríguez, A., Martínez-Olcina, M., Miralles-Amorós, L., & Reche-García, C. (2021). Relationship between emotional intelligence, sleep quality and body mass index in emergency nurses. Healthcare (Switzerland), 9(5), 1–11. https://doi.org/10.3390/healthcare9050607

Mohamud, R. Y. H., Mohamed, N. A., Abdi, A. A., Osman, I. M., Ali, A. N., Doğan, S., Mohamud, S. M., & Orhan, Z. (2025). Prevalence and Associated Factors of Poor Sleep Quality Among Nurses in a Tertiary Care Hospital: A Cross-Sectional Study. Risk Management and Healthcare Policy, 18(February), 975–986. https://doi.org/10.2147/RMHP.S511543

Roslan, N. S., Yusoff, M. S. B., Asrenee, A. R., & Morgan, K. (2021). Burnout prevalence and its associated factors among Malaysian healthcare workers during covid-19 pandemic: An embedded mixed-method study. Healthcare (Switzerland), 9(1). https://doi.org/10.3390/healthcare9010090

Segon, T., Kerebih, H., Gashawu, F., Tesfaye, B., Nakie, G., & Anbesaw, T. (2022). Sleep quality and associated factors among nurses working at comprehensive specialized hospitals in Northwest, Ethiopia. Frontiers in Psychiatry, 13(August), 1–10. https://doi.org/10.3389/fpsyt.2022.931588

Supian, N. S., & Ibrahim, M. I. (2024). Factors influencing sleep quality among nurses in tertiary hospitals in Kelantan, Malaysia: a cross-sectional study. BMC Nursing, 23(1). https://doi.org/10.1186/s12912-024-02557-w

Sooriyaarachchi, P., Jayawardena, R., Pavey, T., & King, N. A. (2022). Shift work and the risk for metabolic syndrome among healthcare workers: A systematic review and meta-analysis. Obesity Reviews, 23(10), 1–10. https://doi.org/10.1111/obr.13489

Wang, D., Lian, J. L., Hua, M. R., Pan, Y. D., & Han, D. M. (2020). Sleep quality and anxiety among nurses in tertiary hospitals in China and the influencing factors: A cross-sectional study. 1–22. https://doi.org/10.21203/rs.3.rs-17774/v1

Zeng, L. N., Yang, Y., Wang, C., Li, X. H., Xiang, Y. F., Hall, B. J., Ungvari, G. S., Li, C. Y., Chen, C., Chen, L. G., Cui, X. L., An, F. R., & Xiang, Y. T. (2020). Prevalence of Poor Sleep Quality in Nursing Staff: A Meta-Analysis of Observational Studies. Behavioral Sleep Medicine, 18(6), 746–759. https://doi.org/10.1080/15402002.2019.1677233