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PREVALENCE AND RISK FACTORS OF INSOMNIA AND SLEEP DISORDERS AMONG MEDICAL PROFESSIONALS IN KSA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: This research aims to determine the Prevalence and Risk Factors of Insomnia and Sleep Disorders among Medical Professionals in KSA.

Methods: This study will employ a cross-sectional design to assess the prevalence and risk factors of insomnia and sleep disorders among medical professionals in Saudi Arabia. Data will be collected through self-administered questionnaires to ensure comprehensive insights into prevalence and risk factors.

Results: The study included 350 participants. The most frequent gender among them was female (n= 208, 59.4%) and male (n= 142, 40.5%). The most frequent age among study participants was 36-40 years (n= 137, 39.1%), followed by 31-35 years (n= 109, 31.1%), then 25-30 years (n=57, 16.3%), and less than 25 years (n=47, 13.4%). The most frequent nationality among study participants was Saudi (n= 287, 82%) and non-Saudi (n= 63, 18%). The Caffeine intake among study participants with the most frequent was three or less cups per day (n=175, 50%), followed by more than three cups per day (n=100, 28.5%), then no coffee (n=75, 21.4%). The participants were asked if they were satisfied with their current sleeping pattern. The most frequent were very dissatisfied (n=112, 32%), followed by dissatisfied (n=90, 25.7%), then moderately satisfied (n=80, 22.9%), and satisfied (n=48, 13.7%), very satisfied (n=20, 5.7%).

Conclusion: The study highlights a significant prevalence of insomnia and sleep disorders among medical professionals in Saudi Arabia, underscoring the impact of demographic factors, work environment, and lifestyle habits. The results indicate that a considerable portion of healthcare workers experience dissatisfaction with their sleep quality, which directly affects their personal well-being and professional performance.

INTRODUCTION

Decreased quality of life and increased mortality and morbidity are both associated with poor sleep quality [1-3]. A thorough assessment of sleep quality considers elements including total sleep duration, sleep medication, bedtime, sleep latency, wake-up time, and sleep quality [4]. Many mental and physical health issues, including depression, anxiety, diabetes, high blood pressure, and coronary artery disease, have been linked to disturbed sleep, which in turn may impact metabolism and immunity [5-7]. Several nations' general populations have an estimated incidence of poor sleep quality ranging from 24% to 66% [8-11].

Research has shown that the sleep quality of healthcare workers is greatly impacted by their lengthy work hours, on-call schedules, and shift work [12]. In addition, there is a significant percentage of burnout among healthcare personnel, which may lead to mishaps or accidents on the job and put patients at risk [13]. Not only did 64.8% of healthcare workers in a recent French nationwide survey report poor sleep quality, but workplace well-being and the quality of the work environment were also found to be associated with poor sleep, even after controlling for individual factors like demographics, medical history, and behavioral traits [14]. Healthcare workers in China, including doctors, nurses, and other medical staff, reported a prevalence of poor sleep quality of 39.2% in a comprehensive review and meta-analysis [15]. Another research among Chinese nurses found that 61.0% of them had poor sleep quality overall [16]. A cross-sectional research conducted in 2017 in Riyadh, KSA, found that 78.3% of the participants had poor sleep quality [17]. Nearly eighty-five percent of medical practitioners in a recent Riyadh research reported having poor sleep quality [18]. Similarly, 86.3% of medical residents in another research reported poor sleep quality [19]. Factors that have been linked to sleep disruptions include being older, being female, having a low body mass index (BMI), being from a poor socioeconomic background, drinking a lot of coffee, being married, not being active, and having a medical or mental disease [18–20].

We performed this research because there is a dearth of local data on healthcare workers' sleep quality, which is a concern since poor sleep quality has negative consequences on patient care and safety. The purpose of this study is to assess the frequency of sleep disruptions among KSA healthcare workers and to identify personal variables that may contribute to this problem.

METHODS

Study design

This study will employ a cross-sectional design to assess the prevalence and risk factors of insomnia and sleep disorders among medical professionals in Saudi Arabia. Data will be collected through self-administered questionnaires to ensure comprehensive insights into both prevalence and risk factors.

Study approach

The study will be conducted in various hospitals and healthcare centers across Saudi Arabia, targeting medical professionals including doctors, nurses, and allied health staff. The selected settings will cover both urban and rural areas to ensure a representative sample.

Study population

The study population will consist of medical professionals (doctors, nurses, and allied healthcare workers) currently working in hospitals and healthcare centers in Saudi Arabia.

Study sample

A stratified random sampling method will be used to select participants from different healthcare settings across Saudi Arabia. The sample size will be calculated based on the expected prevalence of insomnia, using a 95% confidence interval and 5% margin of error. A minimum of 400 participants will be targeted to ensure adequate power for the study.

Study tool

For the current study, the questionnaire was adopted for data collection, which was also categorized as a study tool.

Data collection

Data will be collected through an anonymous self-administered questionnaire distributed electronically. The questionnaire will include sections on demographic information, work environment, lifestyle factors, and validated sleep disorder assessments such as the Insomnia Severity Index (ISI) and the Pittsburgh Sleep Quality Index (PSQI).

Data analysis

Descriptive statistics will be used to summarize demographic data and prevalence of insomnia and sleep disorders. Chi-square tests will be employed to explore associations between categorical variables, while logistic regression will be used to identify significant risk factors. A p-value of less than 0.05 will be considered statistically significant.

Ethical considerations

Ethical approval will be obtained from the institutional review boards (IRBs) of the participating hospitals and healthcare centers. Informed consent will be obtained from all participants, and confidentiality will be maintained by anonymizing the data. Participants will be informed about their right to withdraw at any time without any consequences.

RESULTS

The study included 350 participants. The most frequent gender among them was female (n= 208, 59.4%) and male (n= 142, 40.5%). Figure 1 shows the gender distribution among study participants. The most frequent age among study participants was 36-40 years (n= 137, 39.1%), followed by 31-35 years (n= 109, 31.1%), then 25-30 years (n=57, 16.3%), and less than 25 years (n=47, 13.4%). Figure 2 shows the age distribution among study participants. The most frequent nationality among study participants was Saudi (n= 287, 82%) and non-Saudi (n= 63, 18%). Figure 3 shows the distribution of nationality among study participants.

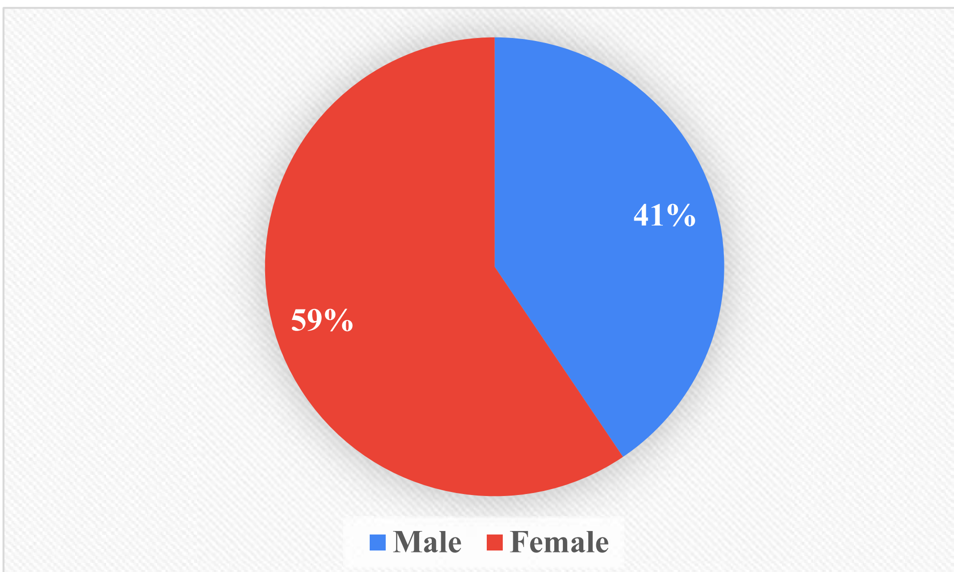

Figure 1: Gender distribution among study participants

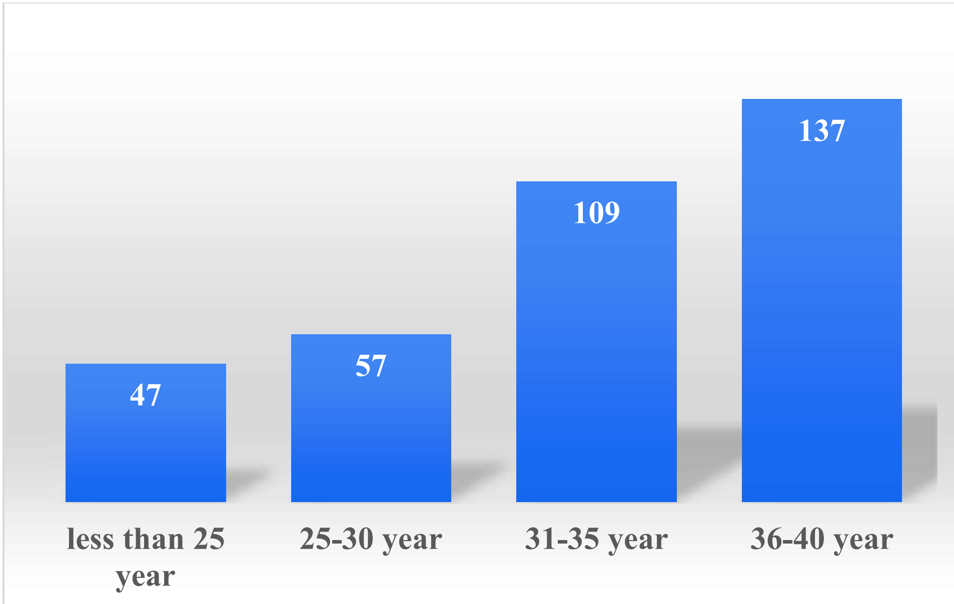

Figure 2: Age distribution among study participants

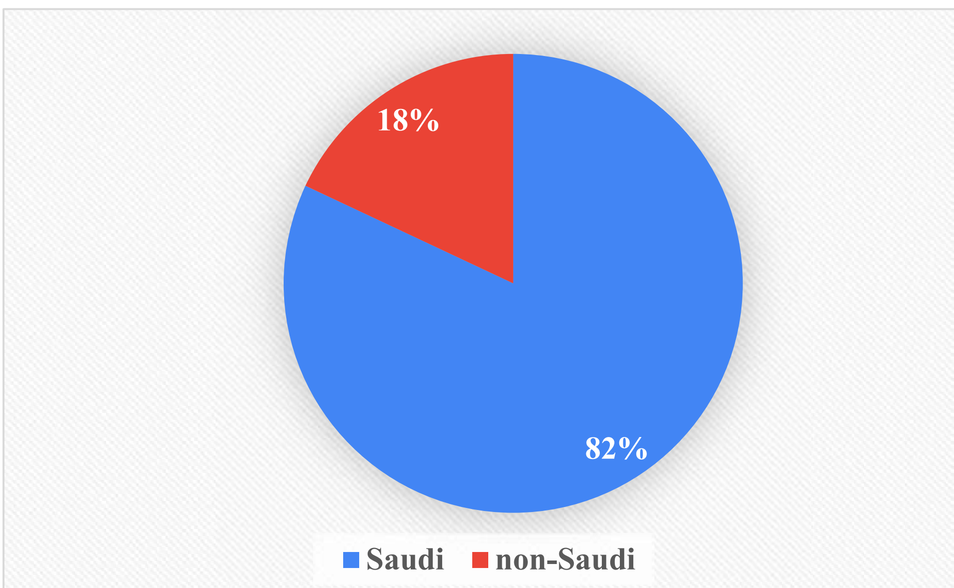

Figure 3: Nationality distribution among study participants

The Caffeine intake among study participants with the most frequent was three or less cups per day (n=175, 50%), followed by more than three cups per day (n=100, 28.5%), then no coffee (n=75, 21.4%). Figure 4 shows the distribution of caffeine intake among study participants.

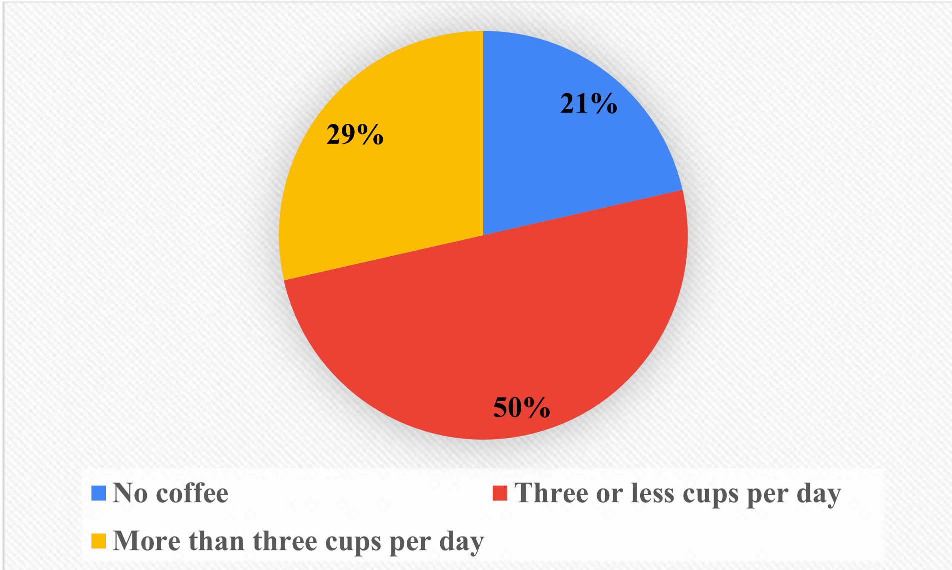

Figure 4: Caffeine intake distribution among study participants

Participants were asked to describe their condition over the past two weeks. The answers are presented in Table 1.

Table 1: Participants were asked to describe their condition over the past two weeks.

Insomnia Severity Index	none	Mild	Moderate	Severe	very severe
Difficulty in falling asleep	5 (1.4%)	21 (6%)	53 (15.1%)	74 (21.1%)	197 (56.3%)
Difficulty in staying asleep	4 (1.1%)	25 (7.1%)	50 (14.3%)	68 (19.4%)	203 (58%)
Waking up very early.	4 (1.1%)	11 (3.1%)	42 (12%)	85 (24.3%)	208 (59.4%)

Participants were asked to assess the past month and often have you had trouble sleeping because. Their responses and results are presented in Table 2.

Table 2: trouble sleeping

During the past month, how often have you had trouble sleeping because you	not at all	less than once a week	once-twice a week	three or more times a week
a. cannot get to sleep within 30 minutes	69 (19.7%)	58 (16.6%)	73 (20.9%)	150 (42.9%)
b. wakes up in the middle of the night or early morning	32 (9.1%)	53 (15.1%)	116 (33%)	149 (42.6%)

c. have to get up to use the bathroom	38 (10.9%)	61 (17.4%)	78 (22.3%)	173 (49.4%)
d. cannot breathe comfortably	46 (13.1%)	87 (24.9%)	100 (28.6%)	117 (33.4%)
e. cough or snore loudly	20 (5.7%)	96 (27.4%)	125 (35.7%)	109 (31.1%)
f. feels too cold	36 (10.3%)	75 (21.4%)	100 (28.6%)	139 (39.7%)
g. feel too hot	52 (14.9%)	86 (24.6%)	96 (27.4%)	116 (33.1%)
h. has bad dreams	20 (5.7%)	64 (18.3%)	117 (33.4%)	149 (42.6%)
i. has pain	21 (6%)	40 (11.4%)	125 (35.7%)	164 (46.9%)

The participants were asked if they were satisfied with their current sleeping pattern. The most frequent were very dissatisfied (n=112, 32%), followed by dissatisfied (n=90, 25.7%), then moderately satisfied (n=80, 22.9%), and satisfied (n=48, 13.7%), very satisfied (n=20, 5.7%).

DISCUSSION

Without a doubt, sleep is crucial to the health and functioning of the human body and ranks high among the most critical physiological processes. The following health problems, cognitive abilities, psychological disorders, metabolic abnormalities, immunological response, and academic performance are all negatively impacted by inadequate sleep: cardiovascular illnesses [21,222,3], neurocognitive function [24,25,26,27], metabolic abnormalities [31,32,33], and academic performance [37, 38].

Adults should aim for 7 to 9 hours of sleep every night, while children and teenagers should aim for up to 11 hours, according to the National Sleep Foundation and the American Academy of Sleep Medicine [39,40,41]. Regardless, a number of studies have shown that disruptions to sleep are more common than we think. For instance, among 836 participants in an Australian study conducted in 2020, 41% of women and 42% of men reported suffering from sleep disorders. More over half of the 5021 people surveyed in a separate Turkish research reported experiencing some kind of sleep disruption [42].

One of the most competitive careers is medicine due to the stringent standards set for entry into medical schools. Consequently, mental health and stress are major variables that may affect the amount and quality of sleep [30, 43], with medical professionals experiencing elevated levels of stress. They are likely to have a wide range of sleep disorders. Reports of falling asleep late, having trouble starting sleep, and sleeping less hours are common among medical professionals, who are more likely to have sleep disturbance than the general population [44]. Additionally, medical professionals are more likely to have trouble sleeping if they use mobile phones and watch television before bed [46,47,48].

Sleep quality is an important issue for medical practitioners because of the rigorous nature of medical school and the potential effects of sleep deprivation on academic performance, clinical results, and mental health. Medical practitioners struggle with sleep disruptions and disorders due to high academic expectations, extended study and clinical hours, and other variables [49, 50].

Reduced cognitive function, judgment, and clinical competence are some ways in which poor sleep hygiene endangers patient care and safety [49, 50]. Mental health issues like sadness, anxiety, and burnout may be exacerbated by sleep disorders and disruptions, which can also increase the chance of acquiring chronic diseases like diabetes and cardiovascular disease [49, 50]. It is crucial for medical professionals to prioritize their sleep health in order to improve their overall well-being, perform better in the classroom and clinic, and influence future healthcare outcomes in a positive way [49, 50].

The medical community is now participating in several meta-analyses on sleep problems [44, 49,50,51]. Nevertheless, there is a lack of information about how COVID-19 affects medical professionals' ability to sleep. Therefore, the purpose of this research is to find out how common sleep disorders are among doctors and other healthcare workers.

CONCLUSION

The study highlights a significant prevalence of insomnia and sleep disorders among medical professionals in Saudi Arabia, underscoring the impact of demographic factors, work environment, and lifestyle habits. The results indicate that a considerable portion of healthcare workers experience dissatisfaction with their sleep quality, which directly affects their personal well-being and professional performance.

REFERENCES

1. Zamanian Z., Nikeghbal K., Khajehnasiri F. Influence of sleep on quality of life among hospital nurses. Electron Physician. 2016;8(1):1811–1816.

2. Robbins R., Quan S.F., Weaver M.D., Bormes G., Barger L.K., Czeisler C.A. Examining sleep deficiency and disturbance and their risk for incident dementia and all-cause mortality in older adults across 5 years in the United States. Aging (Albany NY) 2021;13(3):3254–3268.

3. Hayashino Y., Yamazaki S., Takegami M., Nakayama T., Sokejima S., Fukuhara S. Association between number of comorbid conditions, depression, and sleep quality using the Pittsburgh Sleep Quality Index: results from a population-based survey. Sleep Med. 2010;11(4):366–371.

4. Buysse D.J., Reynolds C.F., 3rd, Monk T.H., Berman S.R., Kupfer D.J. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatr Res. 1989;28(2):193–213.

5. Li Y., Vgontzas A.N., Fernandez-Mendoza J., Bixler E.O., Sun Y., Zhou J., et al. Insomnia with physiological hyperarousal is associated with hypertension. Hypertension. 2015;65(3):644–650.

6. Fernandez-Mendoza J., Shea S., Vgontzas A.N., Calhoun S.L., Liao D., Bixler E.O. Insomnia and incident depression: role of objective sleep duration and natural history. J Sleep Res. 2015;24(4):390–398.

7. Sands-Lincoln M., Loucks E.B., Lu B., Carskadon M.A., Sharkey K., Stefanick M.L., et al. Sleep duration, insomnia, and coronary heart disease among postmenopausal women in the Women's Health Initiative. J Womens Health (Larchmt) 2013;22(6):477–486.

8. Visvalingam N., Sathish T., Soljak M., Chua A.P., Dunleavy G., Divakar U., et al. Prevalence of and factors associated with poor sleep quality and short sleep in a working population in Singapore. Sleep Health. 2020;6(3):277–287.

9. Madrid-Valero J.J., Martínez-Selva J.M., Ribeiro do Couto B., Sánchez-Romera J.F., Ordoñana J.R. Age and gender effects on the prevalence of poor sleep quality in the adult population. Gac Sanit. 2017;31(1):18–22.

10. Fatima Y., Doi S.A., Najman J.M., Mamun A.A. Exploring gender difference in sleep quality of young adults: findings from a large population study. Clin Med Res. 2016;14(3−4):138–144.

11. Park J.H., Yoo M.S., Bae S.H. Prevalence and predictors of poor sleep quality in Korean older adults. Int J Nurs Pract. 2013;19(2):116–123.

12. Alshahrani S.M., Baqays A.A., Alenazi A.A., AlAngari A.M., AlHadi A.N. Impact of shift work on sleep and daytime performance among health care professionals. Saudi Med J. 2017;38(8):846–851.

13. Shanafelt T.D., Boone S., Tan L., Dyrbye L.N., Sotile W., Satele D., et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. Arch Intern Med. 2012;172(18):1377–1385.

14. Coelho J., Lucas G., Micoulaud-Franchi J.A., Philip P., Boyer L., Fond G. Poor sleep is associated with work environment among 10,087 French healthcare workers: results from a nationwide survey. Psychiatr Res. 2023;328.

15. Qiu D., Yu Y., Li R.Q., Li Y.L., Xiao S.Y. Prevalence of sleep disturbances in Chinese healthcare professionals: a systematic review and meta-analysis. Sleep Med. 2020;67:258–266.

16. Zeng L.N., Yang Y., Wang C., Li X.H., Xiang Y.F., Hall B.J., et al. Prevalence of poor sleep quality in nursing staff: a meta-analysis of observational studies. Behav Sleep Med. 2020;18(6):746–759.

17. Ahmed A.E., Al-Jahdali F., AlALwan A., Abuabat F., Bin Salih S.A., Al-Harbi A., et al. Prevalence of sleep duration among Saudi adults. Saudi Med J. 2017;38(3):276–283.

18. Alamri F.A., Amer S.A., Almubarak A., Alanazi H. Sleep quality among healthcare providers; in Riyadh, 2019. Int J Med Sci Clin Invent. 2019;6(5):4438–4448.

19. AlSaif H.I. Prevalence of and risk factors for poor sleep quality among residents in training in KSA. J Taibah Univ Med Sci. 2018;14(1):52–59.

20. Palm A., Janson C., Lindberg E. The impact of obesity and weight gain on development of sleep problems in a population-based sample. Sleep Med. 2015;16(5):593–597.

21. Newman AB, Enright PL, Manolio TA, Haponik EF, Wahl PW, Group CHSR. Sleep disturbance, psychosocial correlates, and cardiovascular disease in 5201 older adults: the Cardiovascular Health Study. J Am Geriatr Soc. 1997;45(1):1–7.

22. Wang Q, Xi B, Liu M, Zhang Y, Fu M. Short sleep duration is associated with hypertension risk among adults: a systematic review and meta-analysis. Hypertens Res. 2012;35(10):1012–8.

23. Meier-Ewert HK, Ridker PM, Rifai N, Regan MM, Price NJ, Dinges DF, et al. Effect of sleep loss on C-reactive protein, an inflammatory marker of cardiovascular risk. J Am Coll Cardiol. 2004;43(4):678–83.

24. Palma J-A, Urrestarazu E, Iriarte J. Sleep loss as risk factor for neurologic disorders: a review. Sleep Med. 2013;14(3):229–36.

25. Hanke JM, Schindler KA, Seiler A. On the relationships between epilepsy, sleep, and Alzheimer’s disease: a narrative review. Epilepsy Behav. 2022;129:108609.

26. Scott LD, Arslanian-Engoren C, Engoren MC. Association of sleep and fatigue with decision regret among critical care nurses. Am J Crit Care. 2014;23(1):13–23.

27. Basner M, Rao H, Goel N, Dinges DF. Sleep deprivation and neurobehavioral dynamics. Curr Opin Neurobiol. 2013;23(5):854–63.

28. López-Muciño LA, García-García F, Cueto-Escobedo J, Acosta-Hernández M, Venebra-Muñoz A, Rodríguez-Alba JC. Sleep loss and addiction. Neurosci Biobehav Rev. 2022;10(141)

29. Lim J, Dinges DF. A meta-analysis of the impact of short-term sleep deprivation on cognitive variables. Psychological bulletin. 2010;136(3):375.

30. Freeman D, Sheaves B, Waite F, Harvey AG, Harrison PJ. Sleep disturbance and psychiatric disorders. Lancet Psychiatry. 2020;7(7):628–37.

31. Cappuccio FP, D'Elia L, Strazzullo P, Miller MA. Quantity and quality of sleep and incidence of type 2 diabetes: a systematic review and meta-analysis. Diabetes Care. 2010;33(2):414–20.

32. Spaeth AM, Dinges DF, Goel N. Effects of experimental sleep restriction on weight gain, caloric intake, and meal timing in healthy adults. Sleep. 2013;36(7):981–90.

33. Liu M, Ahmed WL, Zhuo L, Yuan H, Wang S, Zhou F. Association of sleep patterns with type 2 diabetes mellitus: a cross-sectional study based on latent class analysis. Int J Environ Res Public Health. 2022;20(1):393.

34. Spiegel K, Sheridan JF, Van Cauter E. Effect of sleep deprivation on response to immunizaton. Jama. 2002;288(12):1471–2.

35. Prather AA, Hall M, Fury JM, Ross DC, Muldoon MF, Cohen S, et al. Sleep and antibody response to hepatitis B vaccination. Sleep. 2012;35(8):1063–9.

36. Irwin MR, Olmstead R, Carroll JE. Sleep disturbance, sleep duration, and inflammation: a systematic review and meta-analysis of cohort studies and experimental sleep deprivation. Biol Psychiatry. 2016;80(1):40–52.

37. Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. Sleep Med Rev. 2006;10(5):323–37.

38. Asarnow LD, McGlinchey E, Harvey AG. The effects of bedtime and sleep duration on academic and emotional outcomes in a nationally representative sample of adolescents. J Adolesc Health. 2014;54(3):350–6.

39. Hirshkowitz M, Whiton K, Albert SM, Alessi C, Bruni O, DonCarlos L, et al. National Sleep Foundation's sleep time duration recommendations: methodology and results summary. Sleep Health. 2015;1(1):40–3.

40. Yassin A, Al-Mistarehi A-H, Yonis OB, Aleshawi AJ, Momany SM, Khassawneh BY. Prevalence of sleep disorders among medical students and their association with poor academic performance: a cross-sectional study. Ann Med Surg. 2020;58:124–9.

41. Alfawaz RA, Aljuraiban GS, AlMarzooqi MA, Alghannam AF, BaHammam AS, Dobia AM, et al. The recommended amount of physical activity, sedentary behavior, and sleep duration for healthy Saudis: a joint consensus statement of the Saudi Public Health Authority. Ann Thorac Med. 2021;16(3):239–44.

42. McArdle N, Ward SV, Bucks RS, Maddison K, Smith A, Huang R-C, et al. The prevalence of common sleep disorders in young adults: a descriptive population-based study. Sleep. 2020;43(10):zsaa072.

43. López-Muciño LA, García-García F, Cueto-Escobedo J, Acosta-Hernández M, Venebra-Muñoz A, Rodríguez-Alba JC. Sleep loss and addiction. NeurosciBiobehav Rev. 2022;141:104832.

44. Seoane HA, Moschetto L, Orliacq F, Orliacq J, Serrano E, Cazenave MI, et al. Sleep disruption in medicine students and its relationship with impaired academic performance: a systematic review and meta-analysis. Sleep Med Rev. 2020;53:101333.

45. Meer H, Jeyaseelan L, Sultan MA. Sleep quality and emotional state of medical students in Dubai. Sleep Disord. 2022;2022

46. Abdelmoaty Goweda R, Hassan-Hussein A, Ali Alqahtani M, Janaini MM, Alzahrani AH, Sindy BM, et al. Prevalence of sleep disorders among medical students of umm Al-Qura

University, Makkah, Kingdom of Saudi Arabia. J Public Health Res. 2020;9(1_suppl) jphr. 2020.1921

47. Janatmakan Amiri A, Morovatdar N, Soltanifar A, Rezaee R. Prevalence of sleep disturbance and potential associated factors among medical students from Mashhad, Iran. Sleep Disord. 2020;2020

48. Lawson HJ, Wellens-Mensah JT, Attah NS. Evaluation of sleep patterns and self-reported academic performance among medical students at the University of Ghana School of Medicine and Dentistry. Sleep Disord. 2019;2019

49. Jahrami H, Dewald-Kaufmann J, MeA-I F, AlAnsari AM, Taha M, AlAnsari N. Prevalence of sleep problems among medical students: a systematic review and meta-analysis. J Public Health. 2020;28:605–22.

50. Jahrami H, Alshomili H, Almannai N, Althani N, Aloffi A, Algahtani H, et al. Predictors of excessive daytime sleepiness in medical students: a meta-regression. Clocks Sleep. 2019;1(2):209–19.

51. Rao W-W, Li W, Qi H, Hong L, Chen C, Li C-Y, et al. Sleep quality in medical students: a comprehensive meta-analysis of observational studies. Sleep Breath. 2020;24(3):1151–65.

52. Almutairi H, Alsubaiei A, Abduljawad S, Alshatti A, Fekih-Romdhane F, Husni M, et al. Prevalence of burnout in medical students: a systematic review and meta-analysis. Int J Soc Psychiatry. 2022;68(6):1157–70.

53. Pandi-Perumal SR, Zaki NFW, Qasim M, Elsayed Morsy N, Manzar MD, BaHammam AS, et al. Neuropsychiatric consequences of COVID-19 pandemic: a synthetic review from a global perspective. Alpha Psychiatry. 2022;23(4):144–54.

54. Habbash F, Ben Salah A, Almarabheh A, Jahrami H. Insomnia and related factors during the delta wave of the COVID-19 pandemic in the Kingdom of Bahrain: a cross-sectional study. Nat Sci Sleep. 2022;14:1963–75.

55. Jahrami HA, Alhaj OA, Humood AM, Alenezi AF, Fekih-Romdhane F, AlRasheed MM, et al. Sleep disturbances during the COVID-19 pandemic: a systematic review, meta-analysis, and meta-regression. Sleep Med Rev. 2022;62:101591.

56. da Silva ML, Rocha RSB, Buheji M, Jahrami H, Cunha KDC. A systematic review of the prevalence of anxiety symptoms during coronavirus epidemics. J Health Psychol. 2021;26(1):115–25.

57. Alsalman A, Jahrami H, Mubarak H, Aljabal M, Abdulnabi M, Yusuf A, et al. The psychological impact of COVID-19 pandemic on the population of Bahrain. Acta Biomed. 2020;91(4):e2020131.

ANNEX 1: DATA COLLECTION TOOL

Age		Gender	Male	Female	
Marital Status	Single	Married	Divorced	Widow	
Profession	Doctor (GP)	Doctor (specialist)	Doctor (Consultant)		
	Nurse	Resident doctor	Lab technician		
	Others (Specify)	Health Allied Professional			
Pharmacy	Intern Doctor				
Years of experience	Less than 5 years	5-10 years	More than 10 years		
Nationality	Saudi	Non-Saudi			
Do you work in shifts	Yes	No	Working hours (week)		
Smoking	Current smoker	Non-smoker	Ex-smoker		
Caffeine intake	No coffee	Three or less cups per day	More than three cups per day		

Name:____ Date: _________________

Pittsburgh Sleep Quality Index (PSQI)

Instructions: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. **Please answer all questions.**

1. During the past month, what time have you usually gone to bed at night? ___________________
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night? __________
3. During the past month, what time have you usually gotten up in the morning? ___________________
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) ___________________

5. During the past month, how often have you had trouble sleeping because you…	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
a. Cannot get to sleep within 30 minutes				
b. Wake up in the middle of the night or early morning				
c. Have to get up to use the bathroom				
d. Cannot breathe comfortably				
e. Cough or snore loudly				
f. Feel too cold				
g. Feel too hot				
h. Have bad dreams				
i. Have pain				
j. Other reason(s), please describe:				
6. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
8. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?				
	Very good	Fairly good	Fairly bad	Very bad
9. During the past month, how would you rate your sleep quality overall?				

	No bed partner or room mate	Partner/room mate in other room	Partner in same room but not same bed	Partner in same bed
10. Do you have a bed partner or room mate?				
	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
If you have a room mate or bed partner, ask him/her how often in the past month you have had:				
a. Loud snoring				
b. Long pauses between breaths while asleep				
c. Legs twitching or jerking while you sleep				
d. Episodes of disorientation or confusion during sleep				
e. Other restlessness while you sleep, please describe:				

Insomnia Severity Index

The Insomnia Severity Index has seven questions. The seven answers are added up to get a total score. When you have your total score, look at the 'Guidelines for Scoring/Interpretation' below to see where your sleep difficulty fits.

For each question, please CIRCLE the number that best describes your answer.

Please rate the CURRENT (i.e. LAST 2 WEEKS) SEVERITY of your insomnia problem(s).

Insomnia Problem	None	Mild	Moderate	Severe	Very Severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problems waking up too early	0	1	2	3	4

4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?

Very Satisfied	Satisfied	Moderately Satisfied	Dissatisfied	Very Dissatisfied
0	1	2	3	4

5. How NOTICEABLE to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all Noticeable	A Little	Somewhat	Much	Very Much Noticeable
0	1	2	3	4

6. How WORRIED/DISTRESSED are you about your current sleep problem?

Not at all Worried	A Little	Somewhat	Much	Very Much Worried
0	1	2	3	4

7. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) CURRENTLY?

Not at all Interfering	A Little	Somewhat	Much	Very Much Interfering
0	1	2	3	4

Guidelines for Scoring/Interpretation:

Add the scores for all seven items (questions 1 + 2 + 3 + 4 + 5 +6 + 7) = _______ your total score

Total score categories:
0–7 = No clinically significant insomnia
8–14 = Subthreshold insomnia
15–21 = Clinical insomnia (moderate severity)
22–28 = Clinical insomnia (severe)

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APPENDIX 2: Participants responses to scale items

gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	142	40.6	40.6	40.6
	Female	208	59.4	59.4	100.0
	Total	350	100.0	100.0	

During past month what time have gotten morning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	21	6.0	6.0	6.0
	5	40	11.4	11.4	17.4
	6	107	30.6	30.6	48.0
	7	77	22.0	22.0	70.0
	8	90	25.7	25.7	95.7
	9	15	4.3	4.3	100.0
	Total	350	100.0	100.0	

How SATISFIED with your CURRENT sleep

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very satisfied	20	5.7	5.7	5.7
	satisfied	48	13.7	13.7	19.4
	moderately satisfied	80	22.9	22.9	42.3
	dissatisfied	90	25.7	25.7	68.0
	very dissatisfied	112	32.0	32.0	100.0
	Total	350	100.0	100.0	

how others may notice your sleep problem can impair your quality of life

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Noticeable	30	8.6	8.6	8.6

	A Little	36	10.3	10.3	18.9
	Somewhat	80	22.9	22.9	41.7
	Much	79	22.6	22.6	64.3
	Very Much Noticeable	125	35.7	35.7	100.0
	Total	350	100.0	100.0	

are you concerned about your current sleep problem?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Worried	23	6.6	6.6	6.6
	A Little	36	10.3	10.3	16.9
	Somewhat	48	13.7	13.7	30.6
	Much	135	38.6	38.6	69.1
	Very Much Worried	108	30.9	30.9	100.0
	Total	350	100.0	100.0	

what extent does your sleep problem affect your daily work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Interfering	20	5.7	5.7	5.7
	A Little	44	12.6	12.6	18.3
	Somewhat	82	23.4	23.4	41.7
	Much	79	22.6	22.6	64.3
	Very Much Interfering	125	35.7	35.7	100.0
	Total	350	100.0	100.0	

Chi-Square Test

Frequencies

How.SATISFIED.with.your.CURRENT.sleep

	Observed N	Expected N	Residual
very satisfied	20	70.0	-50.0
satisfied	48	70.0	-22.0
moderately satisfied	80	70.0	10.0
dissatisfied	90	70.0	20.0
very dissatisfied	112	70.0	42.0
Total	350		

Difficulty.falling.asleep

	Observed N	Expected N	Residual
none	5	70.0	-65.0
Mild	21	70.0	-49.0
Moderate	53	70.0	-17.0
Severe	74	70.0	4.0
Very Severe	197	70.0	127.0
Total	350		

Difficulty.staying.asleep

	Observed N	Expected N	Residual
none	4	70.0	-66.0
Mild	25	70.0	-45.0
Moderate	50	70.0	-20.0
Severe	68	70.0	-2.0
Very Severe	203	70.0	133.0
Total	350		

Problems.waking.up.too.early

	Observed N	Expected N	Residual
none	4	70.0	-66.0
Mild	11	70.0	-59.0
Moderate	42	70.0	-28.0
Severe	85	70.0	15.0
Very Severe	208	70.0	138.0
Total	350		

gender

	Observed N	Expected N	Residual
Male	142	175.0	-33.0
Female	208	175.0	33.0
Total	350		

age

	Observed N	Expected N	Residual
less than 25 year	47	87.5	-40.5
25-30 year	57	87.5	-30.5
31-35 year	109	87.5	21.5
36-40 year	137	87.5	49.5
Total	350		

ProfessionProfession

	Observed N	Expected N	Residual
Intern Doctor	20	38.9	-18.9
Doctor (GP)	88	38.9	49.1
Resident doctor	45	38.9	6.1
Doctor (specialist)	34	38.9	-4.9
Doctor (Consultant)	28	38.9	-10.9
Nurse	28	38.9	-10.9
Pharmacy	27	38.9	-11.9
Health Allied Professional	44	38.9	5.1
Lab technician	36	38.9	-2.9
Total	350		

workin.shifts

	Observed N	Expected N	Residual
Yes	130	175.0	-45.0
No	220	175.0	45.0
Total	350		

Caffeineintake

	Observed N	Expected N	Residual
No coffee	75	116.7	-41.7
Three or less cups per day	175	116.7	58.3
More than three cups per day	100	116.7	-16.7
Total	350		

Test Statistics

	How. SATISFIED. with.your. CURRENT. sleep	Difficulty.falling. asleep	Difficulty. staying.asleep	Problems. waking.up.too. early	gender	age	ProfessionProf ession	workin.shifts	Caffeineintake
Chi-Square	74.971[a]	329.429[a]	349.629[a]	398.429[a]	12.446[b]	62.663[c]	83.389[d]	23.143[b]	46.429[e]
df	4	4	4	4	1	3	8	1	2
Asymp. Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.0.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 175.0.

c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 87.5.

d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 38.9.

e. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 116.7.

p-value > 0.05