ISSN: 3029-0708

Review Article

Journal of Clinical Psychology and Neurology

Sleep Disorders: A Narrative Review

Tiffany Field

University of Miami/Miller School of Medicine and Fielding Graduate University, USA

Corresponding author
Tiffany Field, PhD, University of Miami/Miller School of Medicine and Fielding Graduate University, USA.

Received: December 01 2024; **Accepted:** December 11 2024; **Published:** December 18, 2024

ABSTRACT

This narrative review is based on publications found for this year (2024) by entering the terms sleep disorders and 2024 in PubMed and PsycINFO. The estimated prevalence of sleep disorders in the world has varied from 27% to 50%. Several negative effects have been reported for sleep disorders in this current literature. They include cognitive dysfunction, anxiety, digestive diseases, hypertension, cardiovascular conditions, stroke, cancer, intensive care and mortality. Several predictors/risk factors have been the focus of research in this current literature. They could be categorized as activities, professions, and diseases. The activities include excessive screen time, inactivity, and aging. The professions include Olympic athletes, airline pilots and firefighters. The diseases include COVID, inflammatory diseases, irritable bowel syndrome, eating disorders, ADHD, Parkinson's, depression and allostatic load, psychiatric problems and substance use. Only a few buffers for sleeping disorders were found including dietary fiber, vitamin D and antioxidants. Several interventions have appeared in this current literature on sleep disorders. They Include herbal treatments, weighted blankets, exercise, acupuncture, transcranial magnetic stimulation and pharmacological interventions. Potential underlying biological mechanisms for sleep disorders have included low melatonin levels and several genes but especially the circadian regulation PER1 and PER2 genes. Methodological limitations of this current literature are the limited number of empirical studies, the absence of longitudinal research and the combination of different type sleep disorders in the same meta-analyses.

In this narrative review, 53 papers on sleep disorders in adults are summarized. The papers were derived from a search on PubMed and PsycINFO entering the terms sleep disorders in adults and the year 2024. Exclusion criteria for this review included papers on proposed protocols, case studies and non-English language papers. The publications can be categorized as the prevalence of sleep disorders, negative effects of sleep disorders, predictors/risk factors, buffers and interventions. Accordingly, this review is divided into sections that correspond to those categories. Although some papers can be grouped in more than one category, 5 papers are focused on the prevalence of sleep disorders, 13 papers on the negative effects, 19 papers on predictors/risk factors for sleep disorders, 3 papers on buffers, 9 papers on interventions and 4 papers on potential underlying biological mechanisms. A discussion of methodological limitations of this literature appears after those sections.

Prevalence of Sleep Disorders

The estimated prevalence of sleep disorders in the world has varied from 27% to 50% (see table 1) [1,2]. Other prevalence rates have included 33% based on a review of the sleep disorders literature, 46 % in Holland, 75% of COVID survivors [3-5].

Table 1: Prevalence of sleep disorders (and first authors).

Prevalence	First authors
27% world	Gao
50% world	Parithra
33% in a review of the literature	San
46% Holland	Mijnster
75% in COVID survivors	Castelletti

Negative Effects of Sleep Disorders

Several negative effects of sleep disorders have been reported in this recent literature (see table 2). They include cognitive dysfunction, anxiety, digestive diseases, hypertension, cardiovascular conditions, stroke, cancer, intensive care and mortality.

Citation: Tiffany Field. Sleep Disorders: A Narrative Review. J Clin Psychol Neurol. 2024. 2(4): 1-7. DOI: doi.org/10.61440/JCPN.2024.v2.37

Table 2: Negative effects of sleep disorders (and first authors).

Negative Effects	First Authors
Cognitive symptoms	Zhao
Anxiety	Peng
Digestive diseases	Ma
Hypertension	Liu
Cardiovascular diseases	Jaspan, San, Gan
Stroke	Mayer-Strauss
Cancer	Porcacchia
Intensive care	Marchasson
Mortality	Nong, Zolfaghari

Cognitive Symptoms

In a paper entitled "Associations between sleep quality and cognitive symptoms, cognitive symptoms were correlated with sleep latency, wake after sleep onset and sleep efficiency [6]. Surprisingly, sleep problems were not associated with depression as sleep disorders and depression are frequently comorbid conditions.

Anxiety

In a rare longitudinal study entitled "The bi-directional relationship between sleep disturbance and anxiety: Sleep disturbance is a stronger predictor of anxiety", the title reflects the findings [7]. In this sample (N=16,699 participants in China), 41% were experiencing sleep disturbances, but only 8% were experiencing anxiety. In the one-year follow-up assessment, the risk of developing anxiety in those with sleep disturbances was 1.89 times higher than those without sleep disturbances. Bi-directional relationships are apparent in many of these current sleep disorder studies, although the research groups generally focus on a negative effect or a risk factor even though this directionality cannot be determined in cross-sectional studies.

Digestive Diseases

Sleep disorders can lead to constipation [8]. According to these authors, insomnia was the greatest risk factor for constipation.

In a large sample from the UK Biobank study (N = 410), those scoring 5 on their one-item sleep scale showed 28% less risk of any digestive disease including 50% less irritable bowel syndrome, 35% less peptic ulcer and 25% less diverticulitis [9]. Poor sleep and high genetic risk led to 60% increased risk for digestive disease. These data are inconclusive given the one 5-point rating scale used as a measure of sleep disorder.

Hypertension

Sleep disorders have also led to hypertension [10]. In a large NHANES (National Health and Nutrition Examination Survey) sample across seven cities (N=33,383), sleep disorders led to hypertension. Less than seven hours of sleep and sleep latency greater than 30 minutes were the specific sleep factors that led to hypertension in this study. Depression also led to hypertension and sleep and depression combined led to hypertension.

Cardiovascular Diseases

A bi-directional relationship has been noted between sleep disorders and cardiovascular diseases, including hypertension, coronary artery disease, heart failure, and arrhythmias as well as atrial fibrillation [11]. In a paper entitled "The night and day challenge of sleep disorders and insomnia", one third of adults experienced difficulties with sleep initiation/maintenance at least once a week and 6 to 15 per cent met criteria for insomnia disorders [3]. Seventy to 80% of psychiatric patients in this review had sleep disturbances. Sleep disturbances were noted to cause drowsiness or excessive daytime sleepiness leading to functional impairment in 15% of the general adult population. As the authors noted, untreated sleep disturbances can lead to cardiovascular events, cognitive impairment, car accidents, obesity, and diabetes. In another large NHANES database (N= 9886), sleep disorders were closely associated with coronary heart disease [12].

Stroke

In a paper entitled "Sleep disorders as both risk factors for and a consequence of stroke", the title gives the results and the authors acknowledge the bi-directionality of sleep disorders and stroke [13]. In this study, sleep disturbances were occurring in as many as 50 per cent of the stroke victims.

Cancer

In a cross-sectional data analysis of the association between sleep disorders and cancer in the NHANES database (5 databases combined), sleep problems contributed to greater odds of a cancer diagnosis [14]. The specific sleep variables were having trouble sleeping and/or ever telling a doctor one had a sleep problem. Again, these results are based on a non- standardized sleep scale.

Intensive Care Unit Outcomes

In a study on the impact of sleep disturbances on outcomes in intensive care units (N= 131), 50% of the patients had a complete disappearance of REM sleep [15]. Those individuals were more likely to have poor outcomes (24% versus 9%).

Mortality

In a study on cancer survivors from the NHANES database (N= 3187), sleep disorders were associated with all-cause mortality as well as cancer and cardiovascular disease mortality [16]. In the Canadian longitudinal study on aging (N= 30,097), mortality was associated with many sleep problems [17]. However, when the data analysis was adjusted for anxiety and depression, daytime somnolence (drowsiness) disorder was the only sleep variable related to mortality and only in women. This study was unique in adjusting the data analysis for anxiety and depression (frequent comorbidities of sleeping disorders) and for assessing somnolence. The association between somnolence and mortality highlights the need to include that sleep measure in future studies.

Predictors/Risk Factors for Sleep Disorders

Several predictors/risk factors have been the focus of research in this current literature (see table 3). They could be categorized as activities, professions, and diseases. The activities include excessive screen time, and inactivity. The professions include Olympic athletes, airline pilots and firefighters. The diseases include COVID, metabolic conditions, digestive conditions, inflammatory bowel syndrome, eating disorders, ADHD, depression and allostatic load, substance use and aging.

Table 3: Predictors/risk factors for sleep disorders (and first authors).

Predictors/risk factors	First Authors
Excessive screen time	Janc, Parithra
Inactivity	Fei
Aging	Gauld
Olympic athletes	Tulio de Mello
Airline pilots	Yang
Firefighters	Piyach-aiseth, Hamilton
COVID survivors	Castelletti
Irritable bowel syndrome	Zhang, Topan
Eating disorders	Pegasperi
ADHD	Van der Ham
Parkinson's	Tam
Depression	Li, Manosso
Psychiatric outpatients	Mijnster
Substance use	Hochenheimer

Excessive Screen Time

Excessive use of mobile phones and computer time before bedtime can lead to sleep disorders. In a study from Poland (N= 1209), more computer time at bedtime led to a shift in sleep toward midnight, a shift in the circadian rhythm [18].

In a recent review of the literature on sleep disorders, at least 50% of people worldwide suffered from sleep-related disorders [2]. These were related to an increase in screen time, especially in the wake of COVID.

Inactivity

The excessive use of devices may explain the inactivity that relates to sleep disorders. In a sample from the NHANES study (N=8880), the lowest quartile group on activity experienced sleep disorders [19].

Given the data on the relationship between inactivity and sleep disorders, it was surprising to read that Olympic athlete (based on a review of 11 actigraphy studies) experienced sleep disorders [20]. In this review, more than half of the participants had poor sleep quality, including total sleep time, sleep efficiency, and waking after sleep onset. The sleep problems of Olympic athletes may have related to their excessive travel and the resulting disruption of circadian rhythms and/or the stress and anxiety about their performance. Unfortunately, the underlying predictors of the athlete's sleep disorders were not determined in this study.

Aging

Aging also appears to be a risk factor for sleep disorders. In a very large sample (N=35,808 individuals, mean age = 43), thirty-nine clinical variables were explored in a network analysis [21]. Although non-restorative sleep and excessive daytime sleepiness were central symptoms in all age groups and across gender, sleep-related respiratory symptoms and restless leg syndrome were more frequent in older people.

Airline Pilots and Firefighters

A couple professions have been particularly at risk for sleep disorders including airline pilots and firefighters. In the study on airline pilots (N=567), 70% of the flight schedules of civilian airline pilots could lead to circadian disruption [22]. Forty-seven per cent of the pilots in this sample worked under high load status.

At least two studies reported that firefighters had poor sleep quality. In one study from Bangkok (N=600), 44% reported poor sleep quality based on the Pittsburgh Sleep Quality Index [23]. The sleep disturbances were associated with conflicting family relationships, part-time daytime or night jobs and noisy sleeping areas as well as long working hours and shift work. The relative significance of these risk factors was not determined.

In another study on career firefighters (N= 89), 54% experienced apnea, 30% insomnia, 17% apnea and insomnia, and 15% had four or more nightmares per week [24]. Those who had both apnea and insomnia had less sleep time, which led to greater depression and anxiety which led to greater pre-arousal symptoms. Again, it would be informative to know the relative significance of these several risk factors and their contribution to sleep disorders.

Medical Conditions

Medical conditions have also been risk factors for sleep disorders. These include surviving COVID, metabolic problems, digestive conditions, inflammatory bowel syndrome, eating disorders, ADHD, depression and allostatic load, substance use, and Parkinson's.

In a study on the **effects of COVID** on sleep disorders, 75% of patients surviving COVID complained of new-onset sleep disorders [5]. In a comparison between adult patients with sleep disorders (N = 190) and healthy adults (N = 265), those with sleep disorders had greater sleep latency, less sleep efficiency and greater use of sleep hypnotics and medications. Those who had pre-existing sleep disorders as well as females had the highest scores on the Pittsburgh Sleep Quality Index. These data are inconclusive because of the unequal sample sizes.

In a study on sleep disorders in those with **irritable bowel syndrome, Crohn's disease and ulcerative colitis** (N= 208 patients and 199 healthy controls), 60% of the patients had greater prevalence of sleep disorders [25]. Being female gender, older age, smoking, and depression were additional risk factors. It's not clear why these different conditions were combined and whether they differ on the severity of the sleep disorder.

In a similar study on poor sleep quality of individuals with **irritable bowel syndrome** (N= 80), 82% screened positive for insomnia based on poor subjective sleep quality on the Pittsburgh Sleep Quality Index [26]. Surprisingly, gastrointestinal symptoms did not predict poor sleep in this sample.

In a systematic review and meta-analysis of 27 studies on sleep quality in **eating disorders** (N= 711 with eating disorders and 653 without), those with anorexia nervosa, bulimia nervosa and binge eating were noted to have sleep disorders [27]. Less subjective sleep quality was reported by those with sleep

disorders. Poor physiological quality was reported only by those with anorexia, likely because anorexia is typically associated with the worst physical symptoms.

ADHD is another risk factor for sleep disorders. In a sample of adults with ADHD, 60% of those adults had sleep disorders based on the Holland Sleep Disorders Questionnaire (N= 3691 patients with ADHD) [28]. These included delayed sleep phase syndrome (36%), insomnia (30%) and restless leg syndrome (29%). These sleep problems were associated with comorbid depression, anxiety, substance use, personality disorder and post-traumatic stress disorder and it's not clear the degree to which each of these conditions contributed to the sleep disorders.

In a study from Vietnam, sleep disturbances were associated with **Parkinson's** (N= 130) [29]. Ninety-one per cent had a sleep disorder, 76% had insomnia and 56% had restless leg syndrome. Eighty per cent developed the sleep disorder after the diagnosis of Parkinson's and 33% had two disorders. These were accompanied by neck and shoulder pain. It's not clear the degree to which each aspect of the Parkinson's including the movement problems, the neck and shoulder pain and the worry about falling were contributing to sleep disturbances in this sample.

In a sample from the NHANES study (N=4818), 27% had sleep disorders [30]. Based on the Patient Health Questionnaire -9, 16% were experiencing **depression** and 55% of those with depression had **high allostatic loads** (based on 9 biomarkers as an indicator of cumulative wear and tear on physiological systems that predict onset of health problems). It is not clear in this cross-sectional study whether elevated allostatic levels were a risk factor for depression or depression led to increased allostatic levels.

In a sample that experienced comorbid sleep disorders and major depression disorder, the sleep disorder and major depression disorder were both associated with **activation of the hypothalamic pituitary adrenal system and inflammation** [31].

In a sample of **psychiatric outpatients** (N= 1082), sleep disorders were associated with symptom severity based on the Holland Sleep Disorders Questionnaire [4]. In this sample, 46% experienced sleep disorder, 27% insomnia, 12% breathing disorders, 10% hypersomnia, 14% circadian rhythm sleep-wake disorder, 11% parasomnia, and 18% had sleep- related movement disorder.

In a study on the association between sleep disorders and **stress and substance use disorder**, the participants were recruited from 59 substance use disorder treatment programs (N= 4201) [32]. In this cross-sectional and longitudinal study, the Insomnia Severity Index and the Perceived Stress Scale were given. More stress led to insomnia. The use of heroin/fentanyl resulted in less sleep and greater stress, and the use of cocaine led to more stress and less sleep.

Buffers for Sleep Disorders

Only a few buffers for sleep disorders were noted in this literature. They Include dietary fiber, vitamin D and antioxidants (see table 4).

Table 4: Buffers and interventions for sleep disorders (and first authors).

Buffers	First Authors
Dietary fiber	Chen
Vitamin D	Jiang
Antioxidants	Tang
Interventions	
Herbal medicine	Hosseini
Weighted blankets	Dawson
Exercise	Xu, Gao, Gururaj
Acupuncture	Liu, Wu
Transcranial magnetic stimulation	Shen
Melatonin receptor agonists and dual orexin receptor antagonists	Matheson
Melatonin and magnesium supplement	Carlos

Dietary fiber has been implicated as a buffer for sleep disorders [33]. In this NHANES sample (N= 14,360), greater dietary fiber intake led to less sleep disturbance, especially in women with low intensity activity.

In a smaller NHANES cohort (N=4913) with sleeping disorders, an inverse association was noted between **vitamin D** and sleeping disorder [34]. This association suggests that vitamin D may be a buffer for sleeping disorder.

In still another NHANES sample (N= 3062), **antioxidants including carotenoids and vitamin C** were noted to reduce the risk for sleeping disorders [35]. The carotenoids included sweet potatoes, peppers, broccoli, butternut squash, kale, pumpkin, and cantaloupe, all of which convert to vitamin A.

Interventions for Sleep Disorders

Several interventions have appeared in this current literature on sleep disorders (see table 4). They include herbal treatments, weighted blankets, exercise, acupuncture, and transcranial stimulation.

Herbal Medicine

In a paper entitled "Edible, herbal medicines as an alternative to common medication for sleep disorders" like Benzodiazepines and anti-histaminic agents, the authors list a group of edible medicines [36]. They include alkaloids, glycosides, flavonoids, saponins, and tannins that are found in practically every plant.

Weighted Blankets

Weighted blankets have also been used as a sleep intervention [37]. In this review of 18 studies, weighted blankets improved sleep and mood and reduced the use of sleep medications.

Exercise

Exercise has appeared in a few papers on interventions for sleep disturbance. In a systematic review and meta-analysis, exercise modalities were compared in 17 randomized control trials (N=1090 participants) [38]. This analysis suggested that mind-body exercise and moderate aerobic exercise combined with light strength training led to a reduction in sleep disorders. However, in these studies, exercise groups were compared with passive rather than active control groups.

In a WHO survey, 27% of the global population experienced sleep problems [1]. Middle-age and older adults had more severe sleep problems. in this review of 28 studies (N=3460 participants), the effects of different types of exercise on sleep quality were reviewed. Aerobics was the most effective for improving Pittsburgh Sleep Quality Index scores, reducing sleep latency and sleep medicine use. Yoga was the most effective for improving sleep disorders, efficiency, duration, and daytime dysfunction.

Several forms of exercise were effective in a systematic review and meta-analysis of 35 randomized control trials on cancer survivors [39]. The results suggested that aerobics, resistance training and combined aerobics and resistance training, as well as yoga and tai chi were effective at reducing sleep problems. Increased Pittsburgh Sleep Quality Index scores, awake after sleep onset and circadian rhythms as measured by cortisol levels were improved.

Acupuncture

Acupuncture has also been effective for sleep disorders in a systematic review of nine randomized control trials and a meta-analysis (N=719) [40]. Once again, the results are inconclusive given that the acupuncture groups were compared to passive control rather than active control groups.

In a literature review entitled "Acupuncture in circadian rhythms, sleep wake disorders, and it's potential neurochemical mechanisms", several studies noted increased serotonin, dopamine, norepinephrine, melatonin and GABA following acupuncture [40],

Transcranial Magnetic Stimulation

Transcranial magnetic stimulation and deep brain stimulation have also been effective stimulation techniques for reducing sleep problems based on a bibliometric analysis of 459 publications [41]. Transcranial magnetic stimulation and deep brain stimulation were the most frequent keywords found in this analysis.

Pharmacological Interventions

Pharmacological interventions have not only included benzodiazepines as the most popular medication for sleep disorders, but also **melatonin receptor agonists** [42]. Melatonin receptor agonists are considered safer and they are tolerated but have limited effectiveness. **Dual orexin receptor antagonists** have also been used for sleep maintenance, insomnia, and difficult difficulty sleeping onset.

In an intervention study that explored the effects of melatonin and magnesium as a supplement (N= 35), the intervention was conducted for four weeks [43]. **Melatonin and magnesium** were delivered via coffee pods. The scores on the Pittsburgh Sleep Questionnaire Inventory decreased as well as sleep latency and sleep efficiency and total sleep time increased.

Potential Underlying Biological Mechanisms

Mechanism studies have included the use of melatonin and several genes that have been associated with sleep disorders (see table 5). Melatonin is a neurohormone secreted by the pineal gland which can regulate pro and anti-inflammatory cytokines that have been implicated in sleep disorders [44]. An increase in sleep quality has also been noted following melatonin supplements.

Table 5: Potential underlying biological mechanisms for sleep disorders (and first authors).

Mechanisms	First Authors
Melatonin	Megha
20 genes	Fei
PER1 gene	Sochal
PER2 gene	Pavithra

Several genes have been identified in eight sleep-related trials in the UK Bio Bank study (N= 450,000) [19]. In this meta-analysis, 20 genes were associated with sleep disorders.

PER1 and PER2 circadian genes have been especially associated with sleep and sleep disorders. In one study based on polysomnography (N= 80) PER1 expression was correlated positively with total sleep time and NREM sleep duration and negatively correlated with sleep latency [45]. The PER2 gene is reputedly 44% similar to the PER1 gene [2]. The PER2 gene is strongly linked to chronotype and PER2 gene mutations have been strongly linked to sleep disorders.

Methodological Limitations of this Literature

Several methodological limitations can be noted for this current literature. They could be categorized as sampling and methodological problems.

Sampling problems include the rarity of non- Asian studies, which has also been true for recent literature on other comorbid disorders, for example, depression and anxiety. This challenges the generalizability of the results for other cultures. In those studies that involved comparison groups, the samples were often unequal sizes which is a statistical problem. The absence of active control groups in the therapy studies is problematic as having passive control groups leads to inconclusive findings. Surprisingly, waitlist control groups were not used. And, surprisingly, none of the intervention studies focused on sleep medications even though they are increasingly being used for sleep disorders.

Other methodological problems include that this literature was primarily comprised of systematic reviews and meta-analyses with very few recent empirical studies. In the meta-analyses several different types of sleep problems were included, and the relative severity of these and the degree to which they contribute to the sleep disorder were not determined. In the case of the limited empirical studies, most were cross-sectional with one data point. The rarity of potential underlying mechanism papers was also a limitation of this literature

Several variables have been treated as both predictors and negative effects by different researchers, suggesting the bi-directionality of several of the variables. As most of the studies are cross-sectional, causality cannot be determined. Very few multi-variable studies appeared in this literature, making it difficult to determine the relative importance of the predictor variables or the severity of the negative effects. Comorbidities, for example, depression that is often comorbid with sleep disorders was rarely considered [46].

Despite these methodological limitations, this current sleep disorders literature has been informative with respect to effective interventions. The negative effects literature highlights the need for more empirical studies on risk factors to identify those who need intervention.

References

1. Gao X, Qiao Y, Chen Q, Wang C, Zhang P. Effects of different types of exercise on sleep quality based on Pittsburgh Sleep Quality Index in middle-aged and older adults: a network meta-analysis. J Clin Sleep Med. 2024. 20: 1193-1204.
2. Pavithra S, Aich A, Chanda A, Zohra IF, Gawade P, et al. PER2 gene and its association with sleep-related disorders: A review. Physiol Behav. 2024. 273: 114411.
3. San L, Arranz B. The Night and Day Challenge of Sleep Disorders and Insomnia: A Narrative Review. Actas Esp Psiquiatr. 2024. 52: 45-56.
4. Mijnster T, Boersma GJ, van Veen MM, Liemburg E, Cath D, et al. Sleep disorders in a naturalistic cohort of Dutch psychiatric outpatients: prevalence rates and associations with psychopathology symptom severity and well-being. J Sleep Res. 2024. 33: e14009.
5. Castelletti G, Misirocchi F, Zilioli A, Salvatelli ML, Rausa F, et al. How can sleep disorders affect our reaction towards external stressors: a lesson from the COVID-19 outbreak. Neurol Sci. 2024. 45: 391-399.
6. Zhao R, Zhang Z, Li H, Lv D, Wang P, et al. Association Between Sleep Quality and Cognitive Symptoms in Patients with Major Depressive Disorder. J Vis Exp. 2024. 26.
7. Peng A, Ji S, Lai W, Hu D, Wang M, et al. The bidirectional relationship between sleep disturbance and anxiety: Sleep disturbance is a stronger predictor of anxiety. Sleep Med. 2024. 121: 63-68.
8. Tian M, Song Y, Guo Y, Jiang T. Association between sleep disorders and constipation Risk: A systematic review and Meta-Analysis. J Clin Neurosci. 2024. 126: 12-20.
9. Ma Y, Yu S, Li Q, Zhang H, Zeng R, et al. Sleep patterns, genetic susceptibility, and digestive diseases: a large-scale longitudinal cohort study. Int J Surg. 2024. 110: 5471-5482.
10. Liu C, Ye Z, Chen L, Wang H, Wu B, et al. Interaction effects between sleep-related disorders and depression on hypertension among adults: a cross-sectional study. BMC Psychiatry. 2024. 24: 482.
11. Jaspan VN, Greenberg GS, Parihar S, Park CM, Somers VK, et al. The Role of Sleep in Cardiovascular Disease. Curr Atheroscler Rep. 2024. 26: 249-262.
12. Gan TM, Yang YJ, Mo GL, Wang SR, Li SH, et al. Sleep disorders are closely associated with coronary heart disease in US adults (≥20 years): A cross-sectional study. Medicine (Baltimore). 2024. 103: e39698.
13. Mayer-Suess L, Ibrahim A, Moelgg K, Cesari M, Knoflach M, et al. Sleep disorders as both risk factors for, and a consequence of, stroke: A narrative review. Int J Stroke. 2024. 19: 490-498.
14. Porcacchia AS, Pires GN, Andersen ML, Tufik S. A cross-sectional analysis of the association between sleep disorders and cancer using data from the National Health and Nutrition Examination Survey (NHANES) 2005-2014. J Clin Sleep Med. 2024. 20: 515-520.
15. Marchasson L, Rault C, Le Pape S, Arrivé F, Coudroy R, et al. Impact of sleep disturbances on outcomes in intensive care units. Crit Care. 2024. 28: 331.
16. Nong J, Tong J, Wang R, Shi K, Zhang Y. Associations of sleep disorders with all-cause and cause-specific mortality in cancer survivors: a cross-sectional analysis of the NHANES 2005-2016. BMC Psychiatry. 2024. 24: 118.
17. Zolfaghari S, Keil A, Pelletier A, Postuma RB. Sleep disorders and mortality: A prospective study in the Canadian longitudinal study on aging. Sleep Med. 2024. 114: 128-136.
18. Janc M, Jankowska A, Jozwiak Z, Makowiec-Dabrowska T, Jurewicz J, et al. Distribution of sleep components while working remotely. Int J Occup Med Environ Health. 2024. 37: 34-44.
19. Fei Z, Zhu X, Shan Q, Wan F, Tu Y, et al. Association between sleep disorders and physical activity in middle-aged Americans: a cross-sectional study from NHANES. BMC Public Health. 2024. 24: 1248.
20. de Mello MT, Stieler E, Grade I, Filho AFC, Mendes G, et al. The Sleep Parameters of Olympic Athletes: Characteristics and Assessment Instruments. Int J Sports Med. 2024. 45: 715-723.
21. Gauld C, Hartley S, Micoulaud-Franchi JA, Royant-Parola S. Sleep Health Analysis Through Sleep Symptoms in 35,808 Individuals Across Age and Sex Differences: Comparative Symptom Network Study. JMIR Public Health Surveill. 2024. 10: e51585.
22. Yang SX, Cheng S, Sun Y, Tang X, Huang Z. Circadian Disruption in Civilian Airline Pilots. Aerosp Med Hum Perform. 2024. 95: 381-389.
23. Piyachaiseth N, Sithisarankul P, Ratanachina J. Sleep Quality and Associated Factors Among Firefighters in Bangkok, Thailand: A Cross-sectional Study. J Prev Med Public Health. 2024. 57: 83-90.
24. Hamilton NA, Russell J, Hamadah K, Youngren W, Toon A, et al. Screening for Comorbidity of Sleep Disorders in Career Firefighters. J Occup Environ Med. 2024. 66: 43-50.
25. Zhang JZ, Song XZ, Song XN, Shen YL, Tang H, et al. Prevalence and risk factors of sleep disorders in inflammatory bowel disease: a cross-sectional study. Int J Colorectal Dis. 2024. 39: 140.
26. Topan R, Vork L, Pandya S, Keszthelyi D, Cornelis J, et al. Poor subjective sleep quality predicts symptoms in irritable bowel syndrome using the experience sampling method. Official journal of the American College of Gastroenterology| ACG. 2022. 10-4309.
27. Degasperi G, Meneo D, Curati S, Cardi V, Baglioni C, et al. Sleep quality in eating disorders: A systematic review and meta-analysis. Sleep Med Rev. 2024. 77: 101969.
28. van der Ham M, Bijlenga D, Böhmer M, Beekman ATF, Kooij S. Sleep Problems in Adults With ADHD: Prevalences and Their Relationship With Psychiatric Comorbidity. J Atten Disord. 2024. 28: 1642-1652.
29. Tam DM, Linh LTT, Trang DT, Thi Ha An T. Sleep disturbances and associated factors in patients with Parkinson's disease. Clin Neurol Neurosurg. 2024. 244: 108436.
30. Li Y, Yan J, Li Y. Association between allostatic load and depression in patients with sleep disorders: Evidence from the National Health and Nutrition Examination Survey (NHANES). Int J Psychiatry Med. 2024. 59: 670-684.

31. Manosso LM, Duarte LA, Martinello NS, Mathia GB, Réus GZ. Circadian Rhythms and Sleep Disorders Associated to Major Depressive Disorder: Pathophysiology and Therapeutic Opportunities. CNS Neurol Disord Drug Targets. 2024. 23: 1085-1100.
32. Hochheimer M, Ellis JD, Maher B, Strickland JC, Rabinowitz JA, et al. The Association Between Sleep Disturbances and Perceived Stress in Substance Use Disorder Treatment. J Clin Psychiatry. 2024. 85: 23m15220.
33. Chen Y, Zhao Z, Ding W, Zhou Z, Xiao M. Association Between Dietary Fiber Intake and Sleep Disorders: Based on the NHANES Database. Brain Behav. 2024. e70123.
34. Jiang J, Tan H, Xia Z, Li J, Zhou S, Huang T. Serum vitamin D concentrations and sleep disorders: insights from NHANES 2011-2016 and Mendelian Randomization analysis. Sleep Breath. 2024. 28: 1679-1690.
35. Tang L, Liu M, Mu J, Tian J. Association between circulating antioxidants and sleep disorders: comprehensive results from NHANES 2017-2018. Food Funct. 2024. 15: 6657-6672.
36. Hosseini A, Mobasheri L, Rakhshandeh H, Rahimi VB, Najafi Z, et al. Edible Herbal Medicines as an Alternative to Common Medication for Sleep Disorders: A Review Article. Curr Neuropharmacol. 2024. 22: 1205-1232.
37. Dawson S, Charlton K, Ng L, Cleland J, Bulto L, et al. Weighted Blankets as a Sleep Intervention: A Scoping Review. Am J Occup Ther. 2024. 78: 7805205160.
38. Xu M, Tian C, Liang S, Tong B, Wu Y, et al. Comparative efficacy of exercise modalities on sleep quality in populations with sleep disorders: A systematic review and network meta-analysis. Sleep Med Rev. 2024. 73: 101877.
39. Gururaj R, Samuel SR, Kumar KV, Nagaraja R, Keogh JW. Effect of exercise based interventions on sleep and circadian rhythm in cancer survivors-a systematic review and meta-analysis. PeerJ. 2024. 12: e17053.
40. Liu Y, Li Y, Liu M, Zhang M, Wang J, et al. Effects of Acupuncture-Point Stimulation on Perioperative Sleep Disorders: A Systematic Review with Meta-Analysis and Trial Sequential Analysis. Int J Clin Pract. 2024. 2024: 6763996.
41. Shen C, Wang ZD, Qian WJ, Wu CF, Qian SR, et al. Bibliometric Analysis of Brain Stimulation Technologies in Sleep Disorders. Med Sci Monit. 2024. 30: e942687.
42. Matheson EM, Brown BD, DeCastro AO. Treatment of Chronic Insomnia in Adults. Am Fam Physician. 2024. 109: 154-160.
43. Carlos RM, Matias CN, Cavaca ML, Cardoso S, Santos DA, et al. The effects of melatonin and magnesium in a novel supplement delivery system on sleep scores, body composition and metabolism in otherwise healthy individuals with sleep disturbances. Chronobiol Int. 2024. 41: 817-828.
44. Megha KB, Arathi A, Shikha S, Alka R, Ramya P, et al. Significance of Melatonin in the Regulation of Circadian Rhythms and Disease Management. Mol Neurobiol. 2024. 61: 5541-5571.
45. Sochal M, Ditmer M, Tarasiuk-Zawadzka A, Binienda A, Turkiewicz S, et al. Circadian Rhythm Genes and Their Association with Sleep and Sleep Restriction. Int J Mol Sci. 2024. 25: 10445.
46. Field, T. Major depression research: A Narrative Review. Int J Psychiatry, 2024. 9: 01-10.
47. Dos Santos A, Galiè S. The Microbiota-Gut-Brain Axis in Metabolic Syndrome and Sleep Disorders: A Systematic Review. Nutrients. 2024. 16: 390.
48. Wu J, Zhao Z. Acupuncture in circadian rhythm sleep-wake disorders and its potential neurochemical mechanisms. Front Neurosci. 2024. 18: 1346635.
49. Yan M, Fan J, Liu X, Li Y, Wang Y, et al. Acupuncture and Sleep Quality Among Patients With Parkinson Disease: A Randomized Clinical Trial. JAMA Netw Open. 2024. 7: e2417862.