

Journal Scan

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1. *JNMA J Nepal Med Assoc. 2015 Oct-Dec;53(200): 262-265.*

Sleeping Pattern of Medical Students Preceding Viva Examination and Their Performance.

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INTRODUCTION: Sleep is an important determinant of keeping healthy physically and mentally. Deviation in sleep is a common problem among students during examinations. The purpose of this study is to determine students' sleep pattern during night preceding viva examination and its correlation with performance.

METHODS: This was a cross-sectional prospective study conducted between January and February 2014 among 1st and 2nd year MBBS students of National Medical College, Birgunj, Nepal who appeared in University's final practical examinations. Based on simple random sampling approach, each of the 280 participants was allowed to pick out five pieces of lottery papers and they were asked the five questions resembling the number in the list of questions.

RESULTS: Among the total 280 students, 74.6% were from India and 25.4% were from Nepal, and majorities (63%) of them were males. Fifty two percent of the students either could not sleep at all or slept just for 1 to 1.5 hours while 12% slept for 5 to 6.5 hours. Two-third (66%) of the students was able enough to achieve one to two scores, and only 1.8% could succeed to get the maximum score of five.

The correlation between hours of sleep preceding examination and the score achieved was positively

($r=0.701$) and statistically significantly correlated ($p<0.001$).

CONCLUSIONS: There is a trend among the medical students either not to sleep or sleep only for few hours preceding viva examination that result in poor performance in examinations.

2. *Open Access Maced J Med Sci. 2015 Jun 15;3(2): 315-21.*

Sleep Deficiency is a Modifiable Risk Factor for Obesity and Cognitive Impairment and Associated with Elevated Visfatin.

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AIM: To study the interaction between sleep deprivation, obesity and cognitive functions, and the effect of following a balanced low caloric diet and increasing sleep duration on those variables.

SUBJECTS AND METHODS: Ninety two obese females with mean age 47.00 ± 2.00 years and body mass index (BMI) 36.14 ± 3.00 kg/m² were divided into 3 groups according to their sleeping hours. They followed balanced low-caloric diet and were instructed to increase sleeping hours. Full clinical examination, 24 hours dietary intake recall, anthropometric measurements, mini mental state test, questionnaire for subjective sleep and life style evaluation were performed at baseline and after 2 months. Serum visfatin, fasting blood glucose and C-peptide were assessed; Modified homeostatic model assessment of insulin resistance was calculated.

RESULTS: About one third of our sample slept less than 6 hours daily, group (1), all patients had elevated visfatin serum level (33.87 ± 2.8 ng/ml) with the highest level in group (1). At base line, group (1) showed the highest BMI, lowest cognitive functions, highest visfatin level and highest insulin resistance ($P < 0.05$). After 2 months of intervention, improvement was recorded in all variables, with the best improvement in group (1) after extending sleep duration ($P < 0.05$).

CONCLUSION: Sleep deprivation may be a modifiable risk factor for obesity, cognitive impairment and visfatin elevation.

3. *Gastroenterol Hepatol (N Y)*. 2015 Dec;11(12):817-25.

Sleep Dysfunction and Gastrointestinal Diseases.

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Sleep deprivation and impaired sleep quality have been associated with poor health outcomes. Many patients experience sleep disturbances, which can increase the risk of medical conditions such as hypertension, obesity, stroke, and heart disease as well as increase overall mortality. Recent studies have suggested that there is a strong association between sleep disturbances and gastrointestinal diseases. Proinflammatory cytokines, such as tumor necrosis factor, interleukin-1, and interleukin-6, have been associated with sleep dysfunction.

Alterations in these cytokines have been seen in certain gastrointestinal diseases, such as gastroesophageal reflux disease, inflammatory bowel disease, liver disorders, and colorectal cancer. It is important for gastroenterologists to be aware of the relationship between sleep disorders and gastrointestinal illnesses to ensure good care for patients. This article reviews the current research on the interplay between sleep disorders, immune function, and gastrointestinal diseases.

4. *Sleep Health*. 2015 Jun;1(2):115-120.

Shiftwork, Sleep Habits, and Metabolic Disparities: Results from the Survey of the Health of Wisconsin.

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BACKGROUND: With the expanding demand for a 24-hour society, the prevalence of sleep deprivation and other sleep-related health problems is increasing. Shiftwork is an occupational health risk of growing significance because of its high prevalence and because of its potential role as a determinant of socioeconomic-related health disparities.

AIMS: The aim of this study was to examine the associations of shiftwork with overweight status and type 2 diabetes, and explore whether a history of sleep problems mediates or modifies these associations.

PARTICIPANTS AND METHODS: A cross-sectional study was conducted among 1,593 participants in the Survey of the Health of Wisconsin (2008-12) who were employed and reported work characteristics (traditional schedule or shiftwork) and sleep habits and history of sleep problems (insomnia, insufficient sleep, wake timesleepiness). Objective measures of body mass index (BMI) and type 2 diabetes were used.

RESULTS: Shiftworkers were more overweight than traditional-schedule workers (83% vs. 71% with BMI ≥ 25) and reported more sleep problems, such as insomnia symptoms (24% vs. 16%), insufficient sleep (53% vs. 43%), and sleepiness (32% vs. 24%). The associations between shiftwork and being overweight or diabetic were stronger among those reporting insufficient sleep, but the interaction was not statistically significant.

CONCLUSIONS: Shiftworkers face disparities in metabolic health, particularly those with insufficient sleep. Improved understanding of the relationship between sleep and metabolic states can inform healthcare providers' and employers' efforts to screen high-risk individuals and intervene with workplace wellness initiatives to address these disparities.

5. *Tanaffos. 2015;14(3):201-7.*

Association between Occupational Accidents and Sleep Apnea in Hospital Staff.

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BACKGROUND: Obstructive sleep apnea syndrome (OSAS) is a common disorder in which instability of the upper airways leads to a reduction or cessation of airflow during sleep. Sleep disorders such as OSAS increase the risk of occupational accidents and impaired

work performance. Sleep deprivation during shift increases the risk of occupational accidents among health care employees. The purpose of this study was to determine the association between occupational injuries in hospital staff and the risk of sleep apnea.

MATERIALS AND METHODS: This cross-sectional study was conducted on hospital staff of Masih Daneshvari Hospital in 2012. In this study, the hospital staff's (715) response to the Berlin questionnaire plus additional information including a history of an occupational accident, night shifts, less than four hours of night sleep, history of smoking, chronic disease and quality of sleep were assessed. Information obtained was analyzed using SPSS 15.

RESULTS: In general, 27.6% reported a history of occupational accidents. The incidence of occupational accidents in the high-risk group for sleep apnea was significantly higher than the low-risk group (OR=2.736, CI=1.522-4.917, P=0.001). The results of logistic regression analysis also showed a statistically significant association between occupational accidents and risk of sleep apnea (OR = 2.247, CI = 1.194-4.231, P= 0.012).

CONCLUSION: This study showed that the incidence of occupational accidents in the hospital employees is strongly related to the probability of OSA. Therefore, special attention should be directed to respiratory sleep disorders in order to reduce occupational injuries at hospitals.

6. *Sleep Sci. 2015 Nov;8(3):143-52.*

Interactions between sleep, stress, and metabolism: From physiological to pathological conditions.

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Poor sleep quality due to sleep disorders and sleep loss is highly prevalent in the modern society. Underlying mechanisms show that stress is involved in the relationship between sleep and metabolism through hypothalamic-pituitary-adrenal (HPA) axis activation. Sleep deprivation and sleep disorders are associated with maladaptive changes in the HPA axis, leading to neuroendocrine dysregulation. Excess of glucocorticoids

increase glucose and insulin and decrease Adiponectin levels. Thus, this review provides overall view of the relationship between sleep, stress, and metabolism from basic physiology to pathological conditions, highlighting effective treatments for metabolic disturbances.

7. *Sleep Disord.* 2015;2015:179103.

Sleep Habits of Elementary and Middle School Children in South Texas.

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BACKGROUND: Sleep difficulties, including insufficient sleep and inadequate sleep hygiene, have been prevalent among children. Sleep deprivation can lead to poor grades, sleepiness, and moodiness. We undertook this study to assess the prevalence of sleep abnormalities among elementary and middle school students in South Texas and how the groups compare with one another. **Method.** After approval from the appropriate school district for a sleep education program, a baseline survey was taken of elementary and middle school students, using the Children's Sleep Habit Questionnaire-Sleep Self-Report Form, which assessed the domains of bedtime resistance, sleep onset delay, sleep anxiety, sleep duration, nightawakening, and daytime sleepiness. **Results.** The survey was completed by 499 elementary and 1008 middle school children. Trouble sleeping was reported by 43% in elementary school, compared with 29% of middle school children. Fifty percent of middle school children did not like sleeping, compared with 26% in elementary school. Bedtime resistance, sleep onset delay, and nighttime awakening were more common among elementary school students. Daytime sleepiness was more common among the middle school children when compared to elementary school children.

CONCLUSIONS: Sleep abnormalities are present in elementary school children with changes in sleep habits into middle school.

8. *Arch Ital Biol.* 2015 Jun-Sep;153(2-3):144-56.

Pediatric insomnia: new insights in clinical assessment and treatment options.

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Sleep disorders in children can compromise quality of life of both children and families and chronic sleep deprivations is associated with poorer developmental outcome, overweight and behavioral disturbances. Clinicians should incorporate questions about sleep into their routine health assessment, and the assessment of insomnia should follow a medical approach primary and secondary contributing factors should be assessed, as well as maladaptive behaviors related to sleep. A careful examination of sleep/wake schedule, abnormal movements or behavior during sleep, and daytime consequences of sleep disruption or deprivation is mandatory.

Sleeping environment, and bedtime routines should be examined to identify behavioral issues related to sleep. Polysomnography is not routinely indicated for children with insomnia, but actigraphy can give an objective estimation of sleep parameters. The Authors propose a new classification of pediatric insomnia, based on both genetic and clinical aspects, and suggest specific treatment options, including sleep hygiene, behavioral strategies and pharmacological treatment.

9. *Arch Ital Biol.* 2015 Jun-Sep;153(2-3):110-23..

The assessment of somatosensory cortex plasticity during sleep deprivation by paired associative stimulation.

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Many animal studies suggest that during sleep deprivation (SD) synaptic strength should progressively increase, leading to the saturation of the ability to induce long-term potentiation (LTP). Nevertheless, direct evidences about the effects of sustained wakefulness on cortical plasticity in humans are still lacking. The aim of the present study was to assess changes in the ability to induce LTP-like mechanism in humans during a period of SD by means of a paired associative stimulation (PAS) protocol, which combines median nerve stimulation with transcranial magnetic stimulation (TMS) applied over the contralateral somatosensory cortex. During a 41-h SD protocol, 16 healthy subjects, defined as responders to the PAS protocol after a pre-selection session, were involved in 4 experimental sessions (11.00 a.m. and 11.00 p.m. of first and second day) with: a) pre-PAS somatosensory evoked potentials (SEPs) recordings; b) PAS protocol; c) post-PAS SEPs recordings. The effect of PAS on SEPs early components (N20-P25 complex) was assessed. During the first experimental session (without SD) no significant PAS effects on SEPs components amplitude have been found, and large intra- and inter-individual variability have been observed. A lack of significant changes has been observed also in the subsequent sessions. Our results index low intra- and inter-individual reliability of the PAS protocol, suggesting particular caution when longitudinally evaluating the effect of this technique on cortical plasticity.

10. *Arch Ital Biol.* 2015 Jun-Sep;153(2-3):99-109.

Sleep to grow smart?

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Sleep is undisputable an essential part of our life, if we do not sleep enough we feel the consequences the next day. The importance of sleep for healthy brain functioning has been well studied in adults, but less is known for the role of sleep in the paediatric age. Childhood and adolescence is a critical phase for brain development. The increased need for sleep during this developmental phase fosters the growing recognition for a central role of sleep during development.

In this review we summarize the findings that demonstrate a close relationship between sleep and brain maturation, discuss the consequences of insufficient sleep during childhood and adolescence and outline initial attempts that have been made in order to improve sleep in this age range.

11. *J Res Health Sci.* 2015 Fall;15(4):250-5.

Association of Subjective and Interpretive Drowsiness with Facial Dynamic Changes in Simulator Driving.

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BACKGROUND: Major injuries and death in accidents have roots in drowsiness. Sleepiness is a main result of insufficient sleep. It is vital to explore drowsiness and its level. There are various sorts of methods in the forms of subjective and objective approaches. The goal of this study was to detect the association of subjective and interpretive drowsiness with facial dynamic changes.

METHODS: This experimental study was conducted in the Virtual Reality Lab, in Khaje-Nasir Toosi University of Technology, Tehran Iran on 40 drivers in 2015. Facial dynamic changes (eyes, mouth and eyebrows), Karolinska Sleepiness Scale (KSS) and Observer Rating of Drowsiness (ORD) were applied. The neural network and Viola-Jones were utilized for facial characteristics detection. Statistical analyses were conducted using SPSS version 21.

RESULTS: Thirty-four drivers got drowsy during the test. They were selected randomly among suburban drivers at the age in a range of 26 to 60 yr old. Descriptive statistics of the dynamic changes in eyebrows, mouth and eyes showed that these features were of meaningful changes with respect to the level of drowsiness during driving. A relationship between the dynamic changes of facial features and ORD was recognized. Moreover, there was a significant relationship between facial expression and drowsiness ($P < 0.05$).

CONCLUSIONS: Results of KSS and ORD illustrated that there were dynamic changes in eyes and mouth and eyebrow parameters while driver felt sleepy. This research is helpful in a way that specific changes in elements of face could be effective to provide tools to predict drowsiness.

12. Ann Indian Acad Neurol. 2015 Oct-Dec;18(4):403-7.

Differential improvement of the sleep quality among patients with juvenile myoclonic epilepsy with valproic acid: A longitudinal sleep questionnaire-based study.

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OBJECTIVES: The aim of this study was to assess the effect of sodium valproic acid (SVA) on the sleep quality of patients with juvenile myoclonic epilepsy (JME).

MATERIALS AND METHODS: Standardized sleep questionnaires viz. Epworth Sleepiness Scale (ESS) and Pittsburgh Sleep Quality Index (PSQI) were administered to 30 drug-naïve patients with JME (male:female (M:F) = 14:16; age: 21 ± 3.7 years) and the changes following SVA monotherapy was analyzed using t- and chi-squared tests.

RESULTS: The mean age at onset of seizures and diagnosis was 15.43 ± 3.8 and 21 ± 5.1 , years respectively. All had myoclonic jerks with mean duration of 5.23 ± 2.7 years, aggravated by sleep deprivation (23, 76.7%) and sleep-wake transition (29, 96.7%). Twenty-seven (90%) had generalized tonic-clonic seizures (GTCS), majority (70%) on awakening from sleep. Seizures were controlled in 25 patients (83.33%) with SVA monotherapy. Abnormal ESS was noted in five (16.66%) drug naïve patients compared to six (20%) patients while on SVA ($P = 0.782$). Mean ESS remained unchanged before and after SVA therapy (6.27 ± 4.4 vs 6.97 ± 4.7 , $P = 0.262$). On the other hand, only four (13.3%) patients had abnormal PSQI scores at follow-up after initiation of SVA, as compared to 14 (46.7%) subjects in the drug

naïvestate ($P = 0.037$). Further, we also found significant reduction in mean PSQI scores after initiating SVA monotherapy (6.7 ± 5.6 vs 2.7 ± 2.84 , $P \leq 0.0001$).

13. *PLoS One*. 2015 Dec 17;10(12):e0144992.

Selective REM Sleep Deprivation Improves Expectation-Related Placebo Analgesia.

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The placebo effect is a neurobiological and psychophysiological process known to influence perceived pain relief. Optimization of placebo analgesia may contribute to the clinical efficacy and effectiveness of medication for acute and chronic pain management. We know that the placebo effect operates through two main mechanisms, expectations and learning, which is also influenced by sleep.

Moreover, a recent study suggested that rapid eye movement (REM) sleep is associated with modulation of expectation-mediated placebo analgesia. We examined placebo analgesia following pharmacological REM sleep deprivation and we tested the hypothesis that relief expectations and placebo analgesia would be improved by experimental REM sleep deprivation in healthy volunteers. Following an adaptive night in a sleep laboratory, 26 healthy volunteers underwent classical experimental placebo analgesic conditioning in the evening combined with pharmacological REM sleep deprivation (clonidine: 13 volunteers or inert control pill: 13 volunteers). Medication was administered in a double-blind manner at bedtime, and placebo analgesia was tested in the morning. Results revealed that 1) placebo analgesia improved with REM sleep deprivation; 2) pain relief expectations did not differ between REM sleep deprivation and control groups; and 3) REM sleep moderated the relationship between pain relief

expectations and placebo analgesia. These results support the putative role of REM sleep in modulating placebo analgesia. The mechanisms involved in these improvements in placebo analgesia and pain relief following selective REM sleep deprivation should be further investigated.

14. *EBP Briefs*. 2015 May;10(1):1-21.

Sleep Disorders as a Risk to Language Learning and Use.

McGregor KK, Alper RM.

CLINICAL QUESTION: Are people with sleep disorders at higher risk for language learning deficits than healthy sleepers?

METHOD: Scoping Review.

STUDY SOURCES: Pub Med, Google Scholar, Trip Database, Clinical Trials.gov.

SEARCH TERMS: sleep disorders and language and learning; sleep disorders language learning -deprivation -epilepsy; sleep disorders and verbal learning.

NUMBER OF INCLUDED STUDIES: 36.

PRIMARY RESULTS: Children and adults with sleep disorders were at a higher risk for language problems than healthy sleepers. The language problems typically co-occurred with problems of attention and executive function (in children and adults), behavior (in children), and visual-spatial processing (in adults). Effects were typically small. Language problems seldom rose to a level of clinical concern but there were exceptions involving phonological deficits in children with sleep-disordered breathing and verbal memory deficits among adults with sleep-disordered breathing or idiopathic REM sleep behavior disorder.

CONCLUSIONS: Case history interviews should include questions about limited sleep, poor-quality sleep, snoring, and excessive daytime sleepiness. Medical referrals for clients with suspected sleep disorders are prudent.

15. *PLoS One*. 2015 Dec 10;10(12):e0142361.

Recovery Sleep Reverses Impaired Response Inhibition due to Sleep Restriction: Evidence from a Visual Event Related Potentials Study.

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OBJECTIVE: To investigate response inhibition after total sleep deprivation (TSD) and the restorative effects of one night of recovery sleep (RS).

METHODS: Fourteen healthy male participants performed a visual Go/NoGo task, and electroencephalogram recordings were conducted at five time points: (1) baseline, (2) after 12 h of TSD, (3) after 24 h of TSD, (4) after 36 h of TSD, and (5) following 8 h of RS. The dynamic changes in response inhibition during TSD and after 8 h of RS were investigated by examining the NoGo-N2 and NoGo-P3 event-related potential components.

RESULTS: Compared with baseline, NoGo-P3 amplitudes were decreased, while the NoGo-N2 latency increased along with the awake time prolonged. NoGo anteriorization, which was minimized after 24 h of TSD, progressively decreased with increasing TSD. After 8 h of RS, recoveries of both the NoGo-P3 amplitude and NoGo-N2 latency in the prefrontal cortex were observed compared with the values after 36 h of TSD.

CONCLUSION: TSD induced a dose-dependent functional decline in the response inhibition of NoGo-N2 and NoGo-P3 on prefrontal cortex activation, and 8 h of RS resulted in recovery or maintenance of the response inhibition. However, it was not restored to baseline levels.

LIMITATIONS: Participants were chosen male college students only, thus the findings cannot be generalized to older people and women. Additionally, the sample size

was small, and, thus, speculations on the meaning of the results of this study should be cautious. The EEG continuous recording should be employed to monitor the decline of alertness following TSD.

16. *Front Psychol*. 2015 Dec 1;6:1717.

The Role of Environmental Factors on Sleep Patterns and School Performance in Adolescents.

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BACKGROUND: Modern life, with its many distractions, is seeing sleep quantity and quality decline during adolescence. This is a concern as research persuasively demonstrates the negative impact of reduced sleep on academic achievement, both in terms of learning and behavior.

AIMS: This study examined the relationship between sleep and school functioning in adolescence, with a focus on environmental factors that might mediate this relationship.

SAMPLE AND METHOD: Forty-seven adolescents took part. Sleep was measured using the School Sleep Habits Survey (SSHS) and a sleep diary. School records of year grade point averages provided a measure of academic achievement. Raven's Standard Progressive Matrices gave a measure of general cognitive processing. Environmental sleep factors falling into three groups, namely, stimulant consumption, media use and exercise, were measured using a self-report questionnaire.

RESULTS: An average of 7.08 h of sleep was reported. Correlations revealed that Total sleep time (TST) and bedtimes on weekdays were strongly associated with academic achievement. Morning/eveningness and sleep/wake behavior problems had a strong relationship with performance on the Ravens. Stimulant consumption and media use before bed revealed strong relationships with TST and bedtimes on weekdays. Crucially, mediation analyses confirmed that both caffeine consumption and electronic media use before bedtime were negatively associated with academic performance, via the mediating pathway by affecting sleep. Exercise was not associated

with any of the sleep variables, but was associated with better academic performance.

CONCLUSION: The current findings highlight that, now more than ever, parents, schools and policy makers must be aware of the negative effects of caffeinated substances marketed to students, and electronic media use on their sleep habits. Our findings suggest that targeting caffeine consumption and electronic media use before bed may represent effective routes in alleviating modern teenage sleepdebt, and in turn enhancing academic performance.

17.BMC Res Notes. 2015 Dec 1;8:740.

Perceptions of pre-clerkship medical students and academic advisors about sleep deprivation and its relationship to academic performance: a cross-sectional perspective from Saudi Arabia.

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BACKGROUND: The medical student population is believed to be at an increased risk for sleep deprivation. Little is known about students' perceptions towards sleep deprivation and its relationship to academic performance. The aim of study is to explore the perceptions of medical students and their academic advisors about sleep deprivation and its relationship to academic performance.

METHODS: The study took place at Alfaisal University, College of Medicine, Riyadh, Saudi Arabia. An online, anonymous, cross-sectional, self-rating survey was administered to first-, third-year students and their academic advisors. Two-tailed Mann-Whitney U test was used to compare the mean 5-point Likert scale responses between students according to gender, academic year and cumulative grade point average (cGPA).

RESULTS: A total of 259 students and 21 academic advisors participated in the survey (response rates: 70.6 and 84%, respectively). The vast majority of students agreed that sleep deprivation negatively affects academic performance (78.8%) and mood (78.4%). Around 62.2 and 73.7% of students agreed that the demanding medical curriculum and stress of final exams lead to sleep deprivation, respectively. While 36.7% of students voiced the need for incorporation of curricular separate courses about healthy sleep patterns into medical curriculum, a much greater proportion of students (45.9%) expressed interest in extracurricular activities about healthy sleep patterns. Interestingly, only 13.5% of students affirmed that they were counselled about sleep patterns and academic performance by their academic advisors. There were several statistically significant differences of means of students' perceptions according to gender, academic year and cGPA. Despite almost all academic advisors (95.5%) asserted the importance of sleep patterns to academic performance, none (0%) inquired about sleep patterns when counselling students. Nineteen academic advisors (90.5%) recommended incorporation of sleep patterns related learning into medical curricula; among those, only 1 (n = 1/19; 5.3%) recommended learning as a separate course whereas the majority (n = 18/19; 94.7%) recommended learning in forms of extracurricular activities and integration into relevant ongoing courses.

CONCLUSIONS: Our results showed that students had correct conceptions about the negative impact of sleep deprivation on academic performance and mood. Also, our results highlighted the need for curricular/ extracurricular education and counseling about healthy sleep patterns.

18. *Geospat Health*. 2015 Nov 4;10(2):382.

Metropolitan urban hotspots of chronic sleep deprivation: evidence from a community health survey in Gyeongbuk Province, South Korea.

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The geographic concentration of chronic sleep deprivation (CSD) remains largely unexplored. This paper examined the community-specific spatial pattern of the prevalence of CSD and the presence of clustered spatial hotspots among the Korean elderly population in Gyeongbuk Province, South Korea, revealing CSD hotspots and underscoring the importance of geography-focused prevention strategies. The study analysed cross-sectional data collected from 9847 elderly individuals aged 60 years and older who participated in a Korean Community Health Survey conducted in 2012. To assess the level of spatial dependence, an exploratory spatial data analysis was conducted using Global Moran's I statistic and the local indicator of spatial association. The results revealed marked geographic variations in CSD prevalence ranging from 33.4 to 73.4%, with higher values in the metropolitan urban areas and lower in the rural areas. Almost half of the community residents [both men (44.1%) and women (53.5%)] slept 6 h or less per 24 h. The average CSD prevalence (53.6% men and 65.1% women) in the hotspots was about 13.0% higher than that in other areas (42.6% for men and 51.1% for women). To our knowledge, this is the first study to generate a CSD hotspot map that includes data on sleep deprivation across metropolitan district levels. This study demonstrates that not only is sleep deprivation distributed differentially across communities but these differences may be explained by urbanisation.

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Residents' and attendings' perceptions of a night float system in an internal medicine program in Canada.

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BACKGROUND: The Night Float system (NFS) is often used in residency training programs to meet work hour regulations. The purpose of this study was to examine resident and attendings' perceptions of the NFS on issues of resident learning, well-being, work, non-educational activities and the health care system (patient safety and quality of care, inter-professional teams, workload on attendings and costs of on-call coverage).

METHODS: A survey questionnaire with closed and open-ended questions (26 residents and eight attendings in an Internal Medicine program), informal discussions with the program and moonlighting and financial data were collected.

RESULTS AND DISCUSSION: The main findings included, (i) an overall congruency in opinions between resident and attendings across all mean comparisons, (ii) perceptions of improvement for most aspects of resident well-being (e.g. stress, fatigue) and work environment (e.g. supervision, support), (iii) a neutral effect on the resident learning environment, except resident opinions on an increase in opportunities for learning, (iv) perceptions of improved patient safety and quality of care despite worsened continuity of care, and (v) no increases in work-load on attendings or the health care system (cost-neutral call coverage). Patient safety, handovers and increased utilization of moonlighting opportunities need further exploration.