Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

with the studied sleep outcomes.
Conclusions: These results indicate that especially the frequency of night work and on-call shifts as well as long weekly working hours should be limited when promoting hospital physicians sufficient sleep.
Acknowledgements: This study was funded by the Finnish Work Environment Fund (180 022).

RECAPTURING A POSTERIOR OPEN BITE USING A PRECISION MILLED MORNING OCCLUSAL GUIDE

M. Murphy [1], S. Rosenfeldt [2]. [1] *University of Detroit Mercy Scool of Dentistry, Ortrhodontics, Rochester Hills, United States;* [2] *Serenity Valley Family Dentistry, Principle, Fargo, United States*

Recapturing a Posterior Open Bite Using a Precision Milled Morning Occlusal Guide

Shandra Rosenfeldt DDS[1], Mark T Murphy DDS D-ABDSM FAGD[2]
[1] Serenity Valley Family Dental Fargo, ND; [2] Funktional Sleep, Rochester Hills, MI

Introduction: Posterior open bite is often mentioned in the literature as a common and unavoidable side effect of oral appliance therapy. Reducing the therapeutic dose using smaller precision devices (less advancement) and providing the patient with a morning maximum intercuspal position (MIP) re-alignment device (Morning Occlusal Guide) manufacturing of and daily wear of a precision MOG can help patients prevent development of a posterior open bite. MIP posterior contact is often evaluated and recorded using articulating paper and having the patient bite together. If the bite does change, the paper would pull out with little or no resistance. If this condition does occur upon loss of or non-use of their MOG, we can use the archival digital records to recreate the MIP position and re-make a MOG at the original bite relationship. This patient had moved from Dr. Rosenfeldt' s care in Fargo, ND to the Detroit, MI area and was referred to Dr. Murphy for evaluation of a posterior open bite due to a lost MOG and 4 months' time passing.
Methods: The patient was examined and did demonstrate a unilateral posterior open bite. Two new MOGs were ordered from the digital case archives at ProSomnus of the original delivered EVO appliance and MOG, instructions for use were reviewed and the device was delivered to the patient. The patient was also given instructions for exercises according to the AADSM side effect of OAT document.
Results: The patient presented 10 days after delivery and wearing the new MOG and doing the exercises. Posterior occlusion had been re-established as demonstrated with resistance of the articulation paper upon closing together in MIP. The patient reported no discomfort and was happy to have his teeth feel normal again.
Conclusions: Digital archives and the ability to remake a MOG in the same MIP can be an important step in recapturing bite changes in oral appliance therapy.
Support: No financial support was provided for the treatment of this case.
Sheats, R, et al "Management of Side Effects of Oral Appliance Therapy for Sleep-Disordered Breathing" JDSM 2017;(4): 111-125
Cohen-Levy J, "Forces created by mandibular advancement devices in OSAS patients: a pilot study during sleep". Sleep Breath. 2013;17(2):781–789.

SHORT SLEEP DURATION IS ASSOCIATED WITH SUICIDAL IDEATION DURING THE COVID-19 OUTBREAK IN MEDICAL STUDENTS: A LONGITUDINAL COHORT STUDY

Y. Li [1], Q. Qin [2], D. Zheng [1]. [1] *Shantou University Mental Health Center, Sleep Medicine Center, Shantou, China;* [2] *Shantou University Medical College, Shantou, China*

Introduction: The 2019 coronavirus disease (COVID-19) has disrupted millions of lives and commerce. Increased rates of suicide have been reported during this era. Short sleep duration is associated with increased risk for suicide in the general population. In this study, we aimed to examine the association between pre-COVID-19 short sleep duration and suicidal ideation (SI) during the COVID-19 outbreak in medical students.
Materials and Methods: Shantou College Students Sleep Cohort (STCSSC) is a study designed to investigate sleep problems (ie, poor sleep quality, insomnia symptoms, and excessive daytime sleepiness) as risk factors for depression, anxiety, and poor academic performance. At baseline of this study, a voluntary response sample of Shantou University students were selected to complete a series of online questionnaires related to sleep and mood through Questionnaire Star program in the early May and late October of 2019. Among the included 426 freshmen and sophomores, 334 (response rate was 78%) were followed-up during the first wave of COVID-19 pandemic between February to March of 2020.Short sleep duration was defined based on self-reported habitual sleep duration < 7 hours/night. Sleep quality was assessed by Pittsburgh Sleep Quality Index. SI was defined based on a question form the Beck Depression Inventory "do you have any thoughts of killing yourself". Multiple logistic regression was used to examine the association between baseline short sleep duration and SI during the COVID-19 outbreak after adjusting for age, gender, BMI, the severity of depressive and anxiety symptoms and sleep quality.
Results: Among the 334 students included, 50.03% reported habitual short sleep duration at pre-COVID period and 5.70% reported SI during the COVID-19 outbreak. After controlling for potential confounders, short sleep duration at pre-COVID-19 period was significantly associated with SI (OR 5.32 [95% CI 1.34-21.14]) during the COVID-19 outbreak.
Conclusions: Our findings show that self-reported short sleep duration is a risk factor for SI during the COVID-19 outbreak in medical students, suggesting the importance of sufficient sleep in medical students.
Acknowledgements: NA

SLEEP AND CIRCADIAN REST-ACTIVITY PATTERN OF CRITICAL COVID-19 SURVIVORS IN THE LONG-TERM: A 6-MONTH FOLLOW-UP STUDY

A. Targa [1,2], I. Benítez [1,2], A. Moncusí-Moix [1,2], R. Vaca [2], C. Gort-Paniello [1,2], O. Minguez [2], S. Santisteve [2], P. Carmona [2], G. Torres [1,2], G. Labarca [3,4], J. Caballero [5], C. Barberà [6], A. Torres [1,7], J. González [1,2], D. De Gonzalo-Calvo [1,2], F. Barbé [1,2]. [1] *CIBER, Madrid, Spain;* [2] *Biomedical Research Institute of Lleida, Lleida, Spain;* [3] *University of Concepcion, Concepcion, Chile;* [4] *Brigham and Women's Hospital and Harvard Medical School, Boston, United States;* [5] *Hospital Universitari Arnau de Vilanova, Lleida, Spain;* [6] *Hospital Universitari Santa Maria, Lleida, Spain;* [7] *Universitat de Barcelona, Barcelona, Spain*

Introduction: A great percentage of critical COVID-19 survivors report sleep alterations after hospital discharge. The determination of predictive factors for such outcomes is extremely relevant for the personalized management of the patients. Given that sleep fragmentation and circadian disruption are commonly observed among acute respiratory distress syndrome (ARDS) survivors and often potentiated by the intensive care unit (ICU) environment, we hypothesized that a great percentage of critical COVID-19 survivors would present sleep and circadian alterations that would be predicted by the duration of hospitalization and ICU stay. Considering this, we aimed to characterize the sleep and the circadian rest-activity pattern of critical COVID-19 survivors six months after hospital discharge and to determine the baseline predictive factors for the adverse outcomes in this regard.
Materials and Methods: Observational, prospective study from March 2020, to March 2021. We recruited 106 consecutive patients with a confirmed diagnosis of SARS-CoV-2 who developed ARDS and were admitted to the ICU. Only those who attended the medical visit six months after hospital discharge were included in the analyses. The main evaluations included the Pittsburgh sleep quality index (PSQI) and seven days of actigraphy.
Results: The cohort was composed of 106 patients, mostly males (64.2%) with a median [p25;p75] age of 62.0 [55.0;67.8] years. According to the PSQI, 50.9% of the patients presented a compromised sleep quality, which was confirmed by the objective analysis through actigraphy. The circadian rest-activity pattern presented substantial variability among the patients especially in relation to the fragmentation of the rhythm. Body mass index (BMI) could predict sleep (effect size [SD]: 0.221 [0.096]) and circadian-related (0.353 [0.127]) outcomes at the 6-month follow-up. The fragmentation of the rhythm was also predicted by the time spent at the hospital (0.345 [0.121]), at the ICU (0.321 [0.121]), and by the use of

invasive mechanical ventilation (IMV) (0.508 [0.240]). Furthermore, poor sleep quality was associated with other sequelae such as depression (r = 0.58) and anxiety (r = 0.49).
Conclusions: Our findings demonstrate a remarkable prevalence of sleep and circadian alterations in COVID-19 survivors who developed ARDS and were admitted to the ICU. In this context, baseline characteristics such as BMI, time spent at the ICU, and IMV could be useful in predicting adverse outcomes. Altogether, our findings highlight the importance of considering sleep and circadian health of critical patients in the long-term.
Acknowledgments: This study was supported by CIBERESUCICOVID (COV20/00110) and UNESPA.

SLEEP AND MENTAL HEALTH IN CHILEAN YOUNG ADULTS

S. Reyes [1], C. Algarin [1], B. Lozoff [2], P. Peirano [1]. [1] *University of Chile, Institute of Nutrition and Food Technology (INTA), Laboratory of Sleep and Functional Neurobiology, Santiago de Chile, Chile;* [2] *University of Michigan, Department of Pediatrics, Ann Arbor, Michigan, United States*

Introduction: Sleep and mental health are intrinsically related. Evidence showed that poor sleep contributes to the onset and maintenance of mental health alterations, regardless of their severity. Most studies, however, are linked to insomnia, depression or anxiety. This study aimed to assess the relation of sleep quality and daytime sleepiness with behavioral and emotional problems in young adults.
Methods: Participants were part of a cohort follow-up study since infancy. The following questionnaires were applied face-to-face by trained health personnel at INTA: Pittsburgh sleep quality index (PSQI), Epworth sleepiness scale (ESS), and Adult self-report scale (ASR). The global scores of PSQI and ESS were categorized: (a) PSQI: <5 good sleep quality and ≥ 5 poor sleep quality, and (b) ESS: <10 lower amount of daytime sleepiness and ≥10 excessive amount of daytime sleepiness. The ASR comprised eight syndrome scales (anxious/depressed, withdrawn, somatic complaints, thought problems, attention problems, aggressive behavior, rule-breaking behavior, and intrusive) and six Diagnostic and statistical manual of mental disorders (DSM)-oriented scales (depressive, anxiety, somatic, avoidant personality, antisocial personality problems, and attention deficit/hyperactivity [ADH: inattention and hyperactivity/impulsivity subscales] problems). For ASR, we used T-scores norm-based on age and gender. General linear models were conducted and the interaction with sex was assessed using Stata/SE 13.1.
Results: Ninety-four participants (46.8% female and 21.4±0.3 y) were assessed: 62.8% had poor sleep quality and 29.8% excessive daytime sleepiness. Participants with poor sleep quality showed higher scores in withdrawn (59.0 vs 54.4, p<0.001), somatic complaints (60.2 vs 55.3, p<0.001), attention (58.9 vs 54.2, p<0.001), aggressive behavior (55.3 vs 52.8, p<0.01), depressive (59.6 vs 53.6, p<0.001), anxiety (59.8 vs 56.8, p<0.05), avoidant personality (59.8 vs 54.1, p<0.001), and ADH problems (59.0 vs 54.0, p<0.001) compared to participants with good sleep quality. Those with excessive daytime sleepiness presented higher scores in attention (59.5 vs 56.2, p<0.05), intrusive (56.6 vs 53.2, p<0.01), and ADH problems (59.8 vs 56.1, p<0.01) relative to those with lower daytime sleepiness. Further, females with excessive daytime sleepiness showed increased scores in intrusive than females with less daytime sleepiness (59.5 vs 55.8, p<0.01], which was also the case in ADH problems compared to females (61.3 vs 54.9, p<0.001) and males (61.3 vs 57.0, p<0.05) with less daytime sleepiness. Males with higher daytime sleepiness presented greater scores in intrusive with respect to males (60.0 vs 56.3, p<0.01) and females (60.0 vs 55.8, p<0.05) with lower daytime sleepiness.
Conclusion: Our results show a relation between sleep quality and daytime sleepiness with emotional and behavioral characteristics in a group of Chilean young adults. Participants with poor sleep quality or greater daytime sleepiness presented higher score in scales of withdrawn, somatic complaints, attention, intrusive, aggressive behavior, and depressive, anxiety, avoidant personality, and ADH problems.
Support: NIH HD33487 grant.

SLEEP AS PROTECTIVE FACTOR OF CHILDREN'S EXECUTIVE FUNCTIONS: A STUDY DURING COVID CONFINEMENT

M. Beaugrand [1], C. Muehlematter [1], A. Markovic [1], V. Camos [1], S. Kurth [1,2]. [1] *University of Fribourg, Psychology, Fribourg, Switzerland;* [2] *University Hospital Zurich, Department of Pulmonology, Zurich, Switzerland*

Introduction: The abruptly enforced COVID-19 confinement affects sleep and mental health of adults, adolescents and children. Already young children experience worsened sleep quality during confinement, yet potential consequences thereof concerning their maturation of Executive Functions (EFs) remain unexplored. Longitudinal research demonstrates that sleep behavior predicts later behavioral and cognitive development. Accordingly, we propose young children's sleep quality as protective umbrella, preventing negative developmental outcomes from influences of contextual stress. Through the lens of the confinement being an observational-experimental intervention, we tested whether worsening of young children's sleep is tied to EFs outcomes 6 months downstream confinement. We hypothesized that acutely increased night awakenings and prolonged sleep latency relate to lower later EFs scores.
Materials and Methods: First, we assessed sleep behavior during the acute confinement phase (April 2020) with an online survey (Children's Sleep Habits Questionnaire) and analyzed the following 4 core sleep behaviors: bedtimes, sleep latency, nighttime sleep duration, and number of nighttime awakenings. A retrospective sleep assessment referred to the time before confinement (pre-CONFINEMENT), and an assessment referred to the time of survey completion (during-CONFINEMENT). A second survey assessed EFs 6 months later (November 2020, FOLLOW-UP) parent-completed Behavior-Rating-Inventory-of-Executive-Function®—Preschool-Version, (BRIEF-P). This standard behavior-rating scale quantifies EFs for ages 24-71 months. Data on 412 preschool children were collected, and complete data were available for analysis for a total of 45 children aged 36-72 months (53.3±4.4 months; 27 females). Wilcoxon signed-rank tests were used to quantify differences in sleep behavior from pre- to during-CONFINEMENT. We applied linear mixed models with the difference in the 4 sleep behaviors, age, and sex as fixed factors and subject-ID as a random effect accounting for inter-individual differences). For each standard EFs subscale (Inhibit, Shifting, Emotional-Control, Working-Memory, Planning/Organizing), index (*Inhibitory Self-control, Flexibility,* and *EmergentMetacognition)* and the Global-Composite-Score, the best fitting model was identified separately (backward selection, Akaike Information Criterion).
Results: We demonstrate that young children's sleep acutely changed during confinement (more regular bedtimes p=0.003; shorter sleep latency p=0.002). Further, sleep quality and EFs at FOLLOW-UP were associated, including that acutely increased nocturnal awakenings predicted lower inhibitory self-control indices at FOLLOW-UP (p=0.021). Also, acutely increased nocturnal awakenings predicted lower subscales Inhibit and Emotional-Control downstream (p=0.036; p=0.032). Finally, associations were specific to the confinement-induced sleep-change, as demonstrated by the lack of prediction of EFs outcomes through sleep behaviors at pre-CONFINEMENT.
Conclusions: These findings highlight mid-term (i.e., 6 months downstream) behavioral consequences of confinement in young children, related to their acute changes in sleep. These findings transfer the concept formerly evidenced in animals to humans, that inducing poor sleep during developmental periods affects later brain function, thereby supporting the protective sleep-umbrella model.
Acknowledgements: Funding from the Swiss National Science Foundation (PCEFP1-181279), the University of Zurich: Forschungskredit FK-18- 047, Faculty of Medicine, Research in Science and the Humanities (STWF-17-008).

SLEEP CHARACTERISTICS OF IRANIAN PEOPLE AND THEIR EFFECTS ON DAYTIME FUNCTIONING: A POPULATION-BASED STUDY

S. Akbarpour [1], K. Sadeghniiat Haghighi [1], A. Delavari [2], S. Arshi [3], M. Alirezaei [4], F. Aghajani [4], A. Nakhostin-Ansari [5], Z. Alemohammad [1], A. Rahimi [1], A. Najafi [1]. [1] *Tehran University of Medical Sciences, Baharloo*