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The Behavior of the Animal Model of Iron Deficiency for Restless Legs Syndrome: Is the Development Period Crucial for the Model?

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Keywords

- ▶ restless legs syndrome
- ▶ iron-deficient
- ▶ behavior

Introduction: Experiments with iron-deficient rodents provide us with a valuable model for Restless Legs Syndrome (RLS), and the analysis of motor behavior is essential to assess symptoms, as it implies a manifestation of a desire to move. From 21 (weaning) to 35 days of life is a crucial period for the development of the animal, with high plasticity and easily influenced by environmental factors, such as feeding. Interventions at this moment, which is considered a critical window, can result in positive or negative changes. Therefore, the iron-restricted diet initiated during this period could worsen RLS symptoms.

Aim: The aim of the present study is to investigate the behavior of the iron-restricted animal model, with the iron-restricted diet initiated at different times, to refine the experimental model of SPI.

Methods: The male Wistar rats ($n = 20$) were allocated into a control group (CTRL), iron restriction group starting at 21 days of life (REST21) and iron restriction group starting at 35 days of life (REST35). The animals underwent behavioral assessments by the Open Field Test, Novel Object Recognition Test and Pain Threshold Test at 12 and 18 weeks of age. In addition, the animals' weight, food consumption, hematocrit and glucose were analyzed throughout the experiment.

Results: The iron-restricted groups had low hematocrit determinations throughout the experiment and increased fasting glucose at the 12th and 18th week of life ($p < 0.05$), and no difference in pain was found. The animals that received an iron-restricted diet (REST21 and REST35) presented a statistically significant increase in locomotor

activity at the 12th week of life compared with the control. However, the REST21 group presented more homogeneous results of symptoms characteristic of RLS. In the recognition memory test, the CTRL animals performed positively for memory, while the REST21 and REST35 animals showed impaired recognition memory in the test at 18 weeks of life.

Conclusions: The results suggest that both iron restriction models demonstrated behavioral changes in locomotion consistent with RLS, however iron restriction at an earlier stage of development may lead to more expressive results of syndrome symptoms. In addition, memory impairment may be consequences of long-term sleep disturbances caused by RLS. The next steps involve analyzing sleep and physiological changes for the complete analysis of both models. Financial support/acknowledgment: FAPESP 2020/13074–6.

ID: 1455

Meal Timing is Associated with Abdominal Obesity and Elevated Fasting Glucose: A Study from NHANES 2015-2018

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Keywords

- ▶ chrononutrition
- ▶ meal timing
- ▶ obesity
- ▶ metabolic parameters

Introduction: The global prevalence of obesity has dramatically increased during the past decade and parallels the increase in overconsumption of energy-dense food and environmental changes that encourage a sedentary lifestyle. Recent studies suggest that meal timing appears to affect the robustness of circadian rhythms in metabolic organs, and circadian rhythm disruption is emerging as a new risk factor for cardiovascular diseases. In this sense, timing of food intake throughout the day is an important determinant of body weight and metabolic health.

Aim: Investigate the chrononutritional pattern association with obesity and metabolic disorders that make up the metabolic syndrome.

Methods: A total of 1352 adults were included in the analysis. Meal timing data were collected through two 24-

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hour dietary recalls in both cycles (2015–2016 and 2017–2018). From the meal timing, the eating window was established, corresponding to the interval of hours between the first and last meal of the participant, and the first eating episode was regarded as having occurred from 05:00. The eating midpoint was determined by the middle time point between the first and the last meal. The weight, height and waist circumference were collected. Regarding metabolic parameters, fasting glucose, triglycerides, HDL-cholesterol and blood pressure were also collected.

Results: The mean age was 37.59 years and 50.81% were women. The mean BMI was 29.05 kg/m², and the most of participants (67.68%) were classified as overweight or obese. Participants with a longer eating window (> 12 hours) had a higher prevalence of abdominal obesity (IRR, 1.25; 95% CI, 1.06–1.46) when compared with those who ate their meals in a shorter eating window (≤ 12 hours). Also participants in the highest tertile of the time of the first (mean 10:44) and last meal (mean 22:04) had a higher prevalence of abdominal obesity (IRR, 1.26; 95% CI, 1.02–1.54 and IRR, 1.35; 95% CI, 1.08–1.70, respectively) and elevated fasting glucose (IRR, 1.16; 95% CI, 1.02–1.32 and IRR, 1.24; 95% CI, 1.01–1.52, respectively) than those in the first tertile (mean 06:58 and 18:41, respectively).

Conclusions: These findings suggest that chrononutritional patterns, including eating window, first and last meal timing and eating midpoint are related to cardiometabolic risks in free-living American adults.

ID: 1270

Improve Prevention and Care of Sleep Disorders in Brazil to Reduce Premature Deaths by Noncommunicable Diseases

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Keywords

- ▶ noncommunicable diseases
- ▶ diabetes
- ▶ obesity
- ▶ sleep disorders
- ▶ sleep apnea

Introduction: The association between sleep disorders (SD) and noncommunicable diseases (NCDs) is well established. Most SD are NCDs themselves and risk factors for prevalent NCDs, such as diabetes, hypertension, cardiovascular diseases, obesity, and mental health disorders. Our alliance was founded in 2017 to foster partnerships between the public, private and not-for-profit sectors to fight the NCDs.

Aim: Promote awareness and opportunities for intersectoral planning of programs and policies to prevent, diagnose and treat SD and, this way: a) in short-term, have more people diagnosed, treated and experiencing higher life quality; b) mid-term, improve clinical outcomes of SD and of NCDs that are associated to them; c) long-term, reduce premature mortality from NCDs and improve mental health and well-being, aligned with the UN's Sustainable Development Goal 3.4 (SDG 3.4).

Methods: The main methods that we have used to facilitate progress in the topic are: a) disseminate updated information and best-practices through its multiple channels and external media; b) participate in public consultations; c) share calls for submissions of effective models; and d) facilitate meetings with key institutions from multiple sectors to plan together policies and programs to improve SD prevention, diagnosis and care.

Results: The first interactive event about SD was held on May 6th 2022, with 116 attendees and panelists from the following sectors: 8% not-for-profit organizations (civil and medical entities), 14% academia, 16% public health sector, 23% private health sector, 39% private health industries. Preliminary data from the Hermes Project were presented, emphasizing the limitations of SD care in Brazil, from the low number of centers and specialists to timing for diagnosis and treatment - such as up to 30 months for a polysomnographic exam. The model with at-home diagnosis of OSA and other SD, followed by treatment with CPAP when appropriate, through Araguari's Primary Healthcare was applauded and seen as a model to be scaled to other municipalities. Attendees also shared other local experiences - including several barriers - to implement sleep clinics.

Conclusions: We will continue fostering such debates and opportunities to improve attention to SD in Brazil. Among the goals are establishing a National Line of Care to SD and, this way, benefit broad NCDs prevention and care, leading to reduction of premature deaths.

ID: 1254

Was There a Change in the Sleep Quality and Sleepiness of College Students during the COVID-19 Pandemic?

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Keywords

- ▶ sleep
- ▶ sleepiness
- ▶ pandemic
- ▶ COVID-19
- ▶ college students

Introduction: College students were abruptly exposed to remote learning during the COVID-19 pandemic. This change was not restricted only to the methodological part, but also the variation in exposure to environmental cues such as light, social interaction, food, physical activity, among others, which influence the sleep-wake cycle. Therefore, the sleep quality and/or sleepiness of college students could have been altered during the pandemic.

Aim: To evaluate the sleep quality and sleepiness of college students during the COVID-19 pandemic.

Methods: The research was performed with college students ($n = 318$) of both sexes, between 18 and 35 years old, living in the northeast region of Brazil. An electronic form was used at two times: between June and August 2020 (moment 1 - M1); and between June and August 2021 (moment 2 - M2). Individuals who answered the form only in one research

moment were excluded. This electronic form contained the Pittsburgh Sleep Quality Index (PSQI), to assess sleep quality, and the Epworth Sleepiness Scale, to assess the sleepiness of college students. Data were expressed as percentage, mean and standard deviation. The Shapiro-Wilk test was used to investigate the normality of the data and the Wilcoxon test was used for paired analysis between the research moments. The results were analyzed using Graph Pad Prism 8.4.2, considering $p < 0.05$ as significant. The study was approved by the Research Ethics Committee under protocol number: 32360720.4.0000.5208.

Results: The sample was 21.8 ± 3.4 years old and predominantly female (72%). Sleep quality and sleepiness showed no differences between the evaluated moments ($p > 0.05$), with a predominance of poor sleep quality (M1: 60.1%; M2: 59.5%) and sleepiness within the normal range (M1: 69.2%; M2: 67.0%). However, when evaluating the IQSP subdomains, there was a lower latency to initiate sleep ($p < 0.001$) and fewer sleep disturbances ($p = 0.007$) in M2. Despite this, college students had shorter sleep duration and worse sleep efficiency ($p < 0.001$) in M2.

Conclusions: The college students showed no changes in sleep quality or sleepiness during the observed period of the COVID-19 pandemic. However, when analyzing self-reported sleep aspects, in the second year of the pandemic, students reduced their sleep hours, impairing their sleep efficiency.

Acknowledgment:

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ID: 1255

Use of Circadian Heart Rate Rhythm for Infection Detection

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Keywords

- ▶ COVID19
- ▶ circadian rhythm
- ▶ heart rate

Introduction: During an infectious process, there is a significant change in heart rate in response to inflammation. Measurement of heart rate over 24 hours for long periods is possible using the wrist photoplethysmography technique. Some equipment (smartwatches or smartbands) measure and record the average heart rate together with actigraphy data. This allows analyzing the circadian rhythm of the heart rate as well as the average heart rate in periods estimated by actigraphy such as sleep and wakefulness. Using a database of ~5300 volunteers who used smartwatches, 32 people with COVID19 were found. Of this total, 26 (81%) had changes in the smartwatch registration, and 22 (63%) had changes before the onset of symptoms. Another study showed that in 78% of cases pre-symptomatic signs were observed on the smartwatch with a median of three days before the onset of symptoms.

Aim: The objective of the present work was to develop an algorithm that identifies the risk of infection using the circadian rhythm of activity and rest, estimated periods of

sleep and wakefulness by actigraphy and the circadian rhythm of heart rate.

Methods: The physiological data were obtained from a Xiaomi Miband 3 smartband that was connected to a cell phone application. From the data obtained, the following were calculated daily: the amplitude of the heart rate rhythm calculated by the cosinor method, the average heart rate in the period estimated as sleep, the average heart rate in the period estimated as wakefulness and the average heart rate in the 24 hours.

Results: Of the 98 volunteers who used our system in the period, four of them showed symptoms and tested positive for COVID. In all cases, there was a reduction in the amplitude of the heart rate rhythm, an increase in the average heart rate in the 24 hours, in the period estimated as sleep and in the period estimated as wakefulness. In one of the cases, this change occurred before the appearance of symptoms reported by the user.

Conclusions: The present work shows that there are changes detectable by low-cost and widely used equipment and this can help in the management of new infectious diseases. The limitation of this work is that of all the volunteers we did not find asymptomatic positive cases, which makes a specificity analysis difficult. It is possible that of the 94 volunteers who did not test positive for COVID, they became infected but did not show symptoms and therefore did not take the test.

ID: 1256

Effects of High Intensity Exercise - CrossFit® and Bodybuilding on Sleep Outcomes (Daytime Sleepiness and Insomnia), Chronotype and Severity of Depression

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Keywords

- ▶ crossfit
- ▶ bodybuilding
- ▶ sleep
- ▶ chronotype
- ▶ depression

Introduction: Evidence show that physical activity is an important factor for maintaining health, delaying the loss of functional capacity throughout life (CIPRIANI et al., 2010; MACEDO et al., 2003); exerts a beneficial function on mood and sleep alterations, being a method of prevention and treatment without medication (ZUO et al., 2012; JIMÉNEZ-GARCÍA et al., 2021). This research is justified, given the importance of the findings to know how the professional performance should be guided aiming at a benefit for the health and performance of practitioners.

Aim: To assess the effects of CrossFit® and bodybuilding on sleep outcomes (daytime sleepiness and insomnia), chronotype, and depression.

Methods: Descriptive analysis with a quali-quantitative approach emphasizing the sociodemographic, anthropometric and sleep outcomes of a group of Crossfit practitioners and a group of Bodybuilding practitioners, both in the city of Fortaleza/CE, Brazil during the period from February/2022 to May/2022. Data were collected through a structured questionnaire comprising a sociodemographic assessment form and some instruments: ESS, MEQ, IGI and PHQ-9.

Results: 90 CrossFit group participants answered the questionnaires, 38 men and 52 women. The mean total age

was 33.6. In the BodyBuilding group, 44 individuals participated, 21 men and 23 women. The mean age was 32.6. As for the classification of EDS using the Epworth scale, in the CrossFit group, 30% have EDS and in the Bodybuilding group, 18.2%. As for the chronotype (MEQ), in the CrossFit group, 53.3% were morning, 41.1% indifferent and 5.6 were afternoon. In the Bodybuilding group, 47.7% were morning, 40.9% indifferent and 11.4% were in the afternoon. The Mann-Whitney U test, when comparing the IGI between the chronotypes, showed that in both groups, individuals with evening preferences tend to have higher levels of insomnia severity. When comparing depression rates (Mann-Whitney U test) between chronotypes in the CrossFit group, afternoons have higher rates of depression than mornings. In the Bodybuilding group, no difference could be found. In the correlation of variables test (Spearman's rho) in both groups, higher depression indices are associated with higher values of insomnia severity indices.

Conclusions: The result will reflect in the academic and professional spheres, where the result of CrossFit in the health and life of its practitioners will allow a better understanding of this method.

ID: 1258

Association of Eating Jetlag with Food Consumption and BMI among US Adults: Findings from National Health and Nutrition Examination Survey 2017-2018

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Keywords

- ▶ mealtime
- ▶ eating jetlag
- ▶ chronotype
- ▶ BMI

Introduction: Studies have suggested that eating at later times may be a risk factor for overweight. In this same line, recent evidence pointed that varying the mealtime on the weekend in relation to weekdays seems to indicate a higher body mass index (BMI). However, the relationship of this variability with body mass, as well as, with food intake has been insufficient explored.

Aim: To investigate the associations of eating jetlag (the variability of the timing of the eating period on weekend and weekdays) with energy and nutrients intake and BMI. An additional objective was to study these associations according chronotype.

Methods: We used data from the National Health and Nutrition Examination Survey 2017–2018 and a total of 1630 individuals were included in this study. The usual food consumption was estimated by the weighted average of food consumption on weekdays and weekends. Eating jetlag was calculated by the absolute difference between eating midpoint (the middle time point between the first and the last meal) on weekends and weekdays. Chronotype was assessed via mid-sleep time on weekend with correction for sleep debt. Linear regression was performed to determine the associations of eating jetlag with dietary and BMI. To assess the results of the additional aim, we categorized the sample according to chronotype tertile (first tertile indicate morningness tendency and the third tertile indicate evening tendency). Linear regression analysis was performed for each tertile of chronotype to determine the

associations between eating jetlag and BMI and dietary variables.

Results: Associations of eating jetlag with anthropometric parameters, calories and nutrients (carbohydrate, protein, total fat, fiber, cholesterol and sugar) intake was not found. However, a positive association between eating jetlag and BMI were found in the third chronotype tertile ($p < 0.05$). Among those with a tendency to morningness (first tertile), there was a positive association of eating jetlag with calories ($p = 0.002$), carbohydrates ($p = 0.009$), fat ($p = 0.02$), cholesterol ($p = 0.01$) and sugar ($p = 0.01$) intake on the weekend, and a negative association with dietary fiber intake ($p = 0.04$).

Conclusions: Eat meals later on weekend does not seem to influence food consumption or BMI. However, among individuals with evening tendency, delaying meals on weekends seems to reflect a higher BMI and, in individuals with morning tendency, eating later on weekends seems to promote a higher caloric intake on weekends.

ID: 1260

Obstructive Sleep Apnea and Hypertension-mediated Organ Damage in Nonresistant and Resistant Hypertension

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Keywords

- ▶ sleep apnea
- ▶ heart
- ▶ hypertension
- ▶ resistant
- ▶ target-organ damage

Introduction: Obstructive Sleep Apnea (OSA) is common in patients with hypertension, especially in those with Resistant Hypertension (RH). However, it is unclear whether OSA can contribute to target-organ damage in patients with non-resistant hypertension (NRH) and in patients with RH.

Aim: This study aims to evaluate the potential impact of OSA on Hypertension-Mediated Organ Damage (HMOD) in patients with NRH and RH.

Methods: We included patients with hypertension without diabetes from a Tertiary Center to perform a clinical evaluation, a sleep study to define OSA (apnoea-hypopnoea index ≥ 15 events/h), and standard analysis of four HMOD parameters (left ventricular hypertrophy [LVH], increased arterial stiffness [≥ 10 m/s], presence of retinopathy and nephropathy) in a blinded fashion. RH was diagnosed by uncontrolled blood pressure (BP) ($\geq 140/90$ mm Hg) despite using at least three antihypertensive classes or patients with controlled BP using ≥ 4 classes at optimal doses. To avoid the white-coat effect, we performed an ambulatory BP monitoring to confirm the RH diagnosis.

Results: One-hundred patients were included in the analysis (mean age: 54 ± 8 years, 65% female, body mass index: 30.4 ± 4.5 kg/m²). OSA was detected in 52% of patients. In patients with NRH ($n = 53$), the presence of OSA (52.8%) was not associated with increased frequency of HMOD. In contrast, among patients with RH, OSA (51.1%) was associated with an increased rate of LVH (RH-OSA: 61%; RH+OSA: 87%; $p = 0.049$). Considering the total sample, logistic

regression analysis showed that RH (OR: 8.43; 95% CI: 2.51–28.37; $p < 0.001$) and OSA (OR: 4.67; 95% CI: 1.24–17.62; $p = 0.023$) were independently associated with LVH. No significant associations were observed between OSA for arterial stiffness, retinopathy or nephropathy.

Conclusions: OSA is independently associated with LVH in RH, suggesting a potential role of OSA in the RH prognosis.

ID: 1261

Preliminary Results on the Prevalence of Sleep Disorders in Man Adults of Zona da Mata Region of Minas Gerais State

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Keywords

- ▶ sleep disorders
- ▶ disorders of excessive somnolence
- ▶ disorders of excessive somnolence
- ▶ snoring
- ▶ sleep apnea syndrome

Introduction: Sleep is an elementary state of life accounting for several regulatory mechanisms. Healthy humans spend ~30% of their time sleeping.

Aim: Analyze awareness of sleep quality and changes in men and assess daytime sleepiness presented.

Methods: The cross-sectional, man-based study, between May and June 2022 in two cities in Zona da Mata region of Minas Gerais state. The instrument comprised questions about sleep and a specific questionnaire Epworth Sleepiness Scale to measure daytime sleepiness. This question plus Epworth can be helpful in diagnosing sleep disorders.

Results: 69.8% classified the quality of sleep as good, although 39.6% reported having sleep problems and 7.4% did not know how to respond. Among the main problems presented by the sample, the following were the main ones: snoring (58.5%), waking up during the night (37.7%), waking up feeling tired (35.8%), difficulty falling asleep (26.4%), waking up too early and not being able to go back to sleep (24.5%), nightmares (20.7%), excessive sleepiness (18.9%), obstructive sleep apnea (13.2%) and grinding or clenching teeth during sleep (13.2%). These problems happened three or more times a week in 47.1%. In this sample, 83% reported no change in sleep during the pandemic, 13.2% that there was a change for the worse, and 3.8% that their sleep changed for the better. In the sample, 39.6% started to use their cell phone more in bed before going to bed during the pandemic. Using a cell phone together with watching television was what most of the sample did before going to sleep 69.8%. Other harmful habits were also reported: thinking about unresolved issues 24.5%, consumption of alcoholic beverages 20.7%, eating heavy meals 18.8% and consumption of caffeine or cigarettes 16.9%. The Epworth sleepiness scale showed that 37.74% of the sample had normal sleep, 22.64% had average sleepiness and 39.62% had abnormal (possibly pathological) sleepiness.

Conclusions: Clarification is needed regarding harmful habits performed before bed and a greater awareness of the population regarding the changes present in sleep since several changes found was seen in people who considered their sleep to be of good quality.

ID: 1263

Changes in Behavioral and Cognitive Abilities in Children Affected by Persistent Snoring after Rapid Maxillary Expansion

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Keywords

- ▶ palatal expansion technique
- ▶ obstructive sleep apnea syndrome
- ▶ pediatric behavior disorders
- ▶ pediatric sleep apnea
- ▶ sleep disordered breathing

Introduction: Children with Sleep-disordered breathing may have behavioral, emotional, and neurocognitive difficulties such as depression, attention deficit, hyperactivity, aggressiveness, and impulsivity, often leading to poor school performance.

Aim: To verify the changes in behavioral abilities and cognitive functions after rapid maxillary expansion (RME) in children with refractory sleep-disordered breathing (SDB) in the long term after adenotonsillectomy (AT).

Methods: A prospective clinical trial study using RME therapy was conducted. Participant inclusion criteria were children aged from 5 to 12 years, who had adenotonsillectomy, but whose parents/guardians reported that they still snore ≥ 4 nights per week. The 24 patients with transverse maxillary deficiency (TMD) in the sample were divided into two groups based on Pre-RME Obstructive Apnea-Hypopnea Index (OAHI) values, considering the following criteria: Primary Snoring (PS) Group - OAHI < 1 ($n = 13$), and OSA Group OAHI > 1 ($n = 11$). Analyzes were performed on the total sample ($n = 24$) and separately in the PS group and in the OSA group. The patients underwent fiberoptic nasopharyngolaryngoscopy, type 1 polysomnography, Pediatric Sleep Questionnaire (PSQ), Quality of Life Questionnaire (OSA-18), and behavioral and neurocognitive tests.

Results: The PSQ and OSA-18 scores showed statistically significant decrease in both groups ($p < 0.001$) after RME. In the OSA group, the mean scores of "Somatic" and "Aggressiveness" domains decreased significantly ($p < 0.001$). The cognitive functions did not register significant differences Pre- and Post-RME in any of the cognitive functions, except for visuospatial function in the OSA group.

Conclusions: The symptoms and behavioral disturbances should be considered in addition to obstructive apnea-hypopnea index (OAHI) when determining the need for treatment in pediatric SDB. RME can be an alternative treatment for children with SDB refractory to adenotonsillectomy, improving quality of life and behavioral aspects, but these improvements to cannot be assigned to only one cause.

ID: 1266

The Role of Interest Groups in Sleep Medicine Education: Experience Report at the Santa Casa de São Paulo School of Medical Sciences

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Keywords

- ▶ interests groups
- ▶ sleep
- ▶ sleep medicine
- ▶ students
- ▶ medical education

Introduction: Sleep medicine classes are deficient and insufficient during undergraduate medical education. This problem has led medical students to create a Sleep Medicine Interest Group (Liga de Medicina do Sono) – an academical organization for teaching purposes administered by the undergraduate students themselves.

Aim: To describe the establishment of a sleep medicine interest group, as well as to evaluate the results of its first edition on the knowledge about sleep medicine among undergraduate medical students.

Methods: The interest group comprised 15 lectures on different topics of interest to Sleep Medicine. Classes were taken biweekly, and consisted of lectures by invited professors, presentation of clinical cases, and discussion with the students. Only medical undergraduate students from this Medical School were considered eligible for this study. By the end course the attendees (attendance rate > 75%) were invited to fill out a questionnaire including an objective assessment of general sleep medicine knowledge (15 multiple choice questions). Their final score was compared with a sample of non-attendees using a Student's *t*-tests with Welch's correction and the significant threshold was set at $p < 0.05$.

Results: The course interest group had more than 150 enrolled students, with an average of 70 students per class. The questionnaire was filled out by 32 participants, of which 18 were attendees and 14 were non-attendees. Nine participants (28.1%) were 1st or 2nd graders, 15 (46.9%) were 3rd or 4th graders and eight (25.0%) were 5th or 6th graders. Most of the sample ($n=21$; 65.6%) were male and did not have previous experiences with Sleep Medicine ($n=19$; 59.4%). The average result on the final exam was significantly higher among the attendees (6.1 ± 1.2) in comparison with non-attendees ($4.9 \pm 1.3 - p = 0.015$).

Conclusions: The results show that an interest group is a feasible source of information to undergraduate medical students, being useful to supply the educational deficit in sleep medicine education. These initiatives are simple to implement as an alternative to the formal curriculum, and it is also an excellent personal experience for students who have a role on the board. By sharing this experience, we encourage the other initiatives like this one to be created in other medical school, broadening the access of undergraduate medical students to sleep medicine knowledge.

ID: 1268

Follow-up of a Challenging Case of Severe Obstructive Sleep Apnea Treated with Mandibular Advancement Device in the Covid-19 Pandemic

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Keywords

- ▶ interdisciplinarity
- ▶ orthoses
- ▶ obstructive sleep apnea
- ▶ polysomnography
- ▶ oximetry
- ▶ follow-up studies

Introduction: The non-adherence of continuous positive airway pressure (CPAP) for obstructive sleep apnea syndrome (OSAS) patients therapy is typical. A physician must consider a mandibular advancement device (MAD) option for these patients; although CPAP is more effective in AHI improvement, MAD is more acceptable.

Polysomnography (PSG) is a mandatory laboratory sleep study for diagnosed and monitored OSAS patients; however, the test is expensive, time-consuming, and challenging to access, mainly in COVID-19 pandemic. A potential problem in Dental Sleep Medicine is some patients do not accept undergoing a second PSG study to monitor MAD follow-up therapy. For these patients, BIOLOGIX, a Nocturnal Digital monitoring (NDM) with high-resolution oximetry with an accurate OXISTAR sensor, sleep study type IV out-of-center, provides diagnostic performance in OSA severity detection. Although there are few published studies, here we present a challenging case report of OSAS treated with MAD.

Aim: The aim of this challenging case report is to present the MAD therapy for severe OSAS and the NDM out-of-center sleep study in followed-up during the COVID-19 pandemic.

Methods: The case report was a 44-year-old male, caucasian, with a BMI of 40.12 with OSAS of 131.7 ev/hours. The patient was non-adherent to CPAP therapy and submitted for all-night sleep recordings PSG type I to monitor the MAD follow-up. The patient presented excessive daytime sleepiness, non-restorative sleep, respiratory allergy, difficulty nasal breathing, snoring, OSA, and a sedentary lifestyle. The clinical history included prediabetes, hypertension, gastroesophageal reflux disease, nasal polyps, and septum deviation. In clinical examination, he showed macroglossia, Mallampati, and Brodsky classifications of IV and 2, respectively. He presented good mandibular dynamic and neuromuscular stimulus-response. He was treated with MAD, followed up by a multidisciplinary team, and monitored with NDM during the COVID-19 pandemic.

Results: The severe OSA was successfully controlled with MAD to 15.3 ev/h. The action mode of MAD supported the airway patency during sleep, and the NDM confirmed it with an oxygen desaturation index of 5.2 ev/h.

Conclusions: In this challenging case, we followed up OSAS patient during a COVID-19 pandemic with NDM, maintaining good results with a multidisciplinary team to optimize the outcome.

ID: 1269

Overnight Digital Monitoring for OSA Patients Treated with Mandibular Advancement Device in the Covid-19 Pandemic: An Observational StudyD. F. Barbosa¹, M. C. Alves², A. J. Machado Júnior¹¹FCM UNICAMP, Campinas, SP, Brazil²Esalq - USP, Piracicaba, SP, Brazil**Keywords**

- ▶ mandibular advancement
- ▶ obstructive sleep apnea
- ▶ polysomnography
- ▶ oximetry
- ▶ follow-up

Introduction: Polysomnography (PSG) is a laboratory sleep study to diagnose and monitor patients with Obstructive Sleep Apnea (OSA) treated with Positive Air Pressure (PAP) or Mandibular Advancement Device (MAD). However, the PSG was challenging to access during the COVID-19 pandemic. Home sleep test type IV PSG methods are proposed, such as BIOLOGIX, an Overnight Digital Monitoring (ODM), which provides diagnostic performance in detecting OSA. Apnea Hypopnea index and Oxygen desaturation index are the two parameters used in these PSG studies. However, in a recent validation study of ODM, the correlation of both parameters was detected. In Dental Sleep Medicine, the ODM appears to be a valuable tool for MAD therapy follow-up.

Aim: This observational study aims to compare and correlate PSG types 1 and 4 in OSA patients' follow-up with MAD treatment during the COVID-19 pandemic.

Methods: Clinical records of 35 OSA patients diagnosed with PSG type 1, treated with DIORS MAD, and monitored with BIOLOGIX (basal and with MAD) during the COVID-19 pandemic. All patients were indicated to PSG type 1 with MAD, but just 9 patients were able to do it. Then, we just used the basal PSG and ODM (basal and with MAD) in this study. We used quantitative methods to evaluate the correlation between both PSG data by constructing Pearson and Spearman correlation indices. We used contingency tables according to the numerical data normality evaluation, chi-square tests, and the Cramer coefficient V for categorical data. We used the SAS system's support for data analysis, and the significance level for the statistical tests was 5%.

Results: This study included 35 OSA patients (men 59.46%; age:47 /-11years; BMI:26.65 /- 3.24kg/m2; PSG-AHI:14.40 /-14.87/h and ODM-ODI:7.87 /-6.22). We controlled OSA with DIORS MAD and monitored with ODM BIOLOGIX (ODI:3.85 /-4.14). We found Statistical significance in ODI and AHI comparison of SpO2, ODI e AHI mean (standard deviation), and Student t statistic for pared data observed by PSG type 1 and 4 parameters. Also, there was a statistically significant correlation between Heart Rate and ODI with Arousal Index and AHI.

Conclusions: ODM BIOLOGIX is a good tool for follow-up OSA patients in Dental Sleep Medicine practices, mainly during the COVID-19 pandemic, with statistical significance in AHI and ODI.

ID: 1272

Association between Obstructive Sleep Apnea and Temporomandibular Disorders: A Meta-AnalysisC. A. O. Machado¹, C. M. B. M. Resende², J. Stuginski-Barbosa³, A. L. Porporatti⁴, Y. Boucher⁴, A. Michelloti⁵, P. C. Simamoto-Junior¹¹Universidade Federal de Uberlândia, Uberlândia, MG, Brazil²Instituto de Educação Superior de Brasília, Brasília, DF, Brazil³Bauru Orofacial Pain Group, Bauru, SP, Brazil⁴Université de Paris, France⁵Università degli Studi di Napoli Federico II, Italy**Keywords**

- ▶ temporomandibular disorders
- ▶ obstructive sleep apnea
- ▶ systematic review

Introduction: Obstructive Sleep Apnea (OSA) is one of the most common sleep disorders in patients with Temporomandibular Disorders (TMD). Extensive literature has shown that this problem can precede the onset of TMD or worsen symptoms, which could negatively impact treatment response.

Aim: The aim of this meta-analysis was to answer the following question: "Is there an association between Obstructive Sleep Apnea and Temporomandibular Disorders in adults?"

Methods: Two reviewers searched for observational studies assessing the association between TMD and OSA published in six main databases, three from gray literature. To be eligible, studies had to include adults (> 18 years), with no language, gender or time of publication restrictions, using either RDC/TMD or DC/TMD for TMD diagnosis and validated questionnaires and/or polysomnography (PSG) used for OSA. Furthermore, studies should had a comparison with healthy controls. Risk of bias was assessed using the Joanna Briggs Institute Critical Appraisal Checklists. An association meta-analysis was performed for dichotomous outcomes using Odds Ratio (OR) and the Mantel-Haenszel analysis method. Certainty of evidence was screened according to Grading of Recommendations Assessment, Development and Evaluation.

Results: Of the 2266 articles received only six met the inclusion criteria for quantitative analyses. Of them, OSA was assessed by PSG (the gold-standard for OSA diagnosis) in only two papers and in the other four by validated questionnaires (which suggest OSA signs and symptoms). Based on data from the meta-analysis and from the limited number of included studies the differences in the overall odds of having OSA in TMD patients favor a positive association (OR = 3.06; 95% CI = 1.72 to 5.44). High values for the I2 (91%) and Tau2 (0.44) tests were observed, suggesting that the included studies were notably heterogeneous in their reported effect size.

Conclusions: In general, TMD patients had a statistically positive association with OSA within an OR of 3.06. • Against this background, OSA screening should be a routine part of the diagnostic assessment of patients with TMD. • Given the various OSA assessment methods used and current small number of included studies, a larger number of studies with PSG OSA diagnostic are needed to better investigate this association.

ID: 1276

Influence of Sleep on Injuries and Illnesses in Paralympic Athletes

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Keywords

- ▶ sleep complaints
- ▶ actigraphy
- ▶ athletic injuries
- ▶ para-athletes

Introduction: Paralympic sports tend to have a higher injury incidence than Olympic sports. Also, due to their underlying medical condition, illnesses such as urinary tract infections are highly prevalent in athletes with disabilities. Sleep is essential for the optimal functioning of several systems in the human body. Previous studies have suggested that poor sleep may impair muscle recovery and immune function which can favor the development of injuries and illnesses.

Aim: To evaluate sleep characteristics and investigate the relationship of sleep with injuries and illnesses in Paralympic athletes.

Methods: This was a cross-sectional study with 20 Paralympic athletes of athletics, swimming, and powerlifting. The sleep-wake pattern was monitored for 2 weeks through actigraphy. The Morningness and Eveningness Questionnaire, Pittsburgh Sleep Quality Index PSQI, Athlete Sleep Behavior Questionnaire, and the Sleep Complaints Questionnaire were also applied. Injury and illnesses were recorded for two weeks through the Oslo Sports Trauma Research Center questionnaire (OSTRC).

Results: We found a 90% prevalence of poor sleep quality and 45% of poor sleep behavior. The intermediate chronotype was the most prevalent (45%). The mean TST was 6.57 ± 49.91 . Frequency of insomnia ($r = 0.51$; $p = 0.02$), PSQI score ($r = 0.45$; $p = 0.04$), and frequency of awakenings at night ($r = 0.58$; $p = 0.01$) were associated with severity of health problems; frequency of movements during sleep was associated with OSTRC cumulative score ($r = 0.58$; $p = 0.00$); and frequency of nightmares was associated with OSTRC mean score.

Conclusions: Paralympic athletes tend to report poor sleep quality, have poor sleep behavior and sleep less than the recommended. Insomnia symptoms, awakenings at night, movements during sleep and poor sleep quality were associated with the occurrence and/or severity of health problems.

ID: 1277

Assessment of the Quality of Sleep of Medical Residents and Interns at a Public University in Central Western Brazil

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Keywords

- ▶ sleepiness
- ▶ sleep quality
- ▶ health

Introduction: Medical training requires a large workload of training in shifts where medical residents and

internal students are exposed to working hours with few hours dedicated to rest. This can lead to sleep deprivation and, consequently, inhibition of the physiological processes that take place during this period. Memorization, learning and attention are among these processes compromised by poor sleep quality and can impair performance of people.

Aim: To evaluate the sleep quality and daytime sleepiness of medical interns and residents.

Methods: This is a cross-sectional and observational study with online data collection through two self-administered questionnaires, the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS), to medical residents and interns at the public university in central western Brazil. The process of tabulating the information collected was performed using the computer program, Microsoft Excel. The Free and Informed Consent Term (ICF) was applied, as approved by the Ethical Committee.

Results: In the study developed, it was identified that 66.67% of the interns had poor sleep, among them ~27.78% had some disorder, while among residents the disorder occurred in 22.5%, with 73.33% of them had poor sleep quality, but in the comparison between the groups this difference was not statistically significant ($p = 0.79$). Among the internals, 79.16% reported having difficulty sleeping, and the proportion of medical residents who experienced this situation was similar. Regarding the use of sleeping pills, there was a rate of 34.16% among residents, while among internals the rate was 59.72%. The average number of hours of sleep was five hours per night in both groups. Differently, in the daytime sleepiness survey, the percentage of sleepiness classified as excessive was 70.83% among the internals and 89.17% in the group of residents, with $p = 0.0003$ in the comparison between the groups.

Conclusions: The assessment of sleep quality was compromised in both groups evaluated. But daytime sleepiness resonated more among residents, although the use of sleeping pills is almost twice as high among internals. These data are in accordance with the literature and should serve as an important alert for educators in the elaboration of teaching projects in these groups aimed at the physical and mental health of students and patient safety.

ID: 1278

Edentulism in Obstructive Sleep Apnea - A Case Report

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Keywords

- ▶ sleep
- ▶ obstructive sleep apnea
- ▶ sleep apnea syndromes
- ▶ edentulous jaw

Introduction: Edentulism has been considered an independent risk factor for obstructive sleep apnea because

of its association with decreased retropharyngeal space and reduced pharyngeal muscle tone.

Aim: To describe the clinical, anthropometric and craniofacial evaluation of an edentulous patient with obstructive sleep apnea.

Methods: A 67-year-old male patient with complaints of snoring and assisted sleep apnea. The diagnostic investigation was performed using the Pittsburgh Sleep Quality Index (PSQI), Stop Bang, Berlin Questionnaire (BQ), Epworth Sleepiness Scale (ESS), and type I polysomnography. The clinical evaluation included collecting demographic and anthropometric data: body mass index (BMI), neck circumference (NC), and abdominal circumference (AC). Extraoral dental protocol: Cranial Index (CI), Facial Index (FI), Thyromental Distance (TMD), Vertical Dimension of Occlusion (VDO) with and without dental prosthetics (Pts). Intraoral dental protocol: Modified Mallampati Index (MMI), Brodsky Palatine Tonsils Scale (BPTS), oral cavity and teeth evaluation.

Results: Polysomnography showed an AHI of 24.6 ev/h, the ODI in REM sleep of 28.4 ev/h and NREM sleep of 3.4 ev/h. Questionnaire scores were PSQI = 3; Stop Bang = 5; BQ = high risk; and ESS = 3. Anthropometric parameters were BMI = 31.7 kg/m²; NC = 42cm; AC = 111cm. The dental protocol measurements were: CI = 83.9 (brachycephalic); FI = 72.6 (hypereuriprosopic); TMD = 7.5 cm; VDO with Pts = 6.0 cm; VDO without Pts = 5.7 cm; MMI = grade IV and BPTS = grade I. An intraoral examination showed an elongated soft palate, swollen and elongated uvula, and edentulism in the upper and lower arches.

Conclusions: In the individual mentioned, the tooth loss promoted vertical and horizontal alveolar ridge bone resorption, decreased vertical dimension of occlusion, decreased lower face height and relative macroglossia. These findings are described in studies in the literature as risk factors of edentulism for the pathogenesis of obstructive sleep apnea.

ID: 1280

Impact of the Covid-19 Pandemic on Sleep Quality and Burnout Prevalence in Multi-Professional Health Residents

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Keywords

- ▶ sleep
- ▶ burnout
- ▶ hospital residence
- ▶ somnolence
- ▶ coronavirus

Introduction: Health residencies aim at professional qualification, however their extensive workload and academic and professional demand, in addition to the challenges of the current situation of the COVID-19 pandemic, can lead to physical and mental stress with potential repercussions in quality of life.

Aim: To evaluate the sleep quality and Burnout syndrome of multidisciplinary residents comparing periods before and during the covid-19 pandemic.

Methods: The study was cross-sectional, quantitative in nature and was performed with multiprofessional residents of a public hospital in northeastern Brazil. Data collection took place in two moments: the first moment was in

2018, when data was collected from 28 residents; the second moment was in 2021, data were collected from 36 residents. A sociodemographic form, the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS) and the Preliminary Burnout Identification Questionnaire were applied.

Results: Sixty-four residents participated in the study, most of them female (84.4%), with a mean age of 25.9 ± 2.1 years. Regarding sleep quality, there was an average PSQI of 8.4 ± 3.1, with no difference between the groups before and during the pandemic. There was a high frequency of poor sleep quality among residents both before and during the pandemic with 67.9% vs 80.6%, respectively. A mean ESS score of 10.7 ± 4.1 was observed, with no difference between the groups. Regarding the symptoms of burnout syndrome, comparing residents before and during the pandemic, a frequency of 39.3% vs 52.8% was observed in the initial phase and 46.4% vs 36 in the initial phase of installation, but no significant difference between groups.

Conclusions: Residents presented poor sleep quality and signs of Burnout Syndrome, especially in the initial and installation phase of the disease. No differences were found in sleep quality, sleepiness and burnout symptoms between residents before and during the COVID-19 pandemic.

ID: 1285

Genetics, Rhythm, and Cognition: Effect of BDNF Val66Met Polymorphism on Adolescents' Circadian Rhythms and Attentional Performance

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Keywords

- ▶ sleep
- ▶ circadian rhythm
- ▶ BDNF Val66Met
- ▶ attention
- ▶ adolescence

Introduction: Cognitive performance is impacted by sleep habits, chronotypes and genetic characteristics. Variations in circadian mechanisms generate different individual preferences timing for sleep and activity, called chronotypes, affecting the performance of cognitive skills during the day. There is a tendency to eveningness during adolescence. The Val66Met (rs6265) polymorphism, in the human Brain-Derived Neurotrophic Factor gene, plays a significant role in the cognitive performance and circadian rhythm patterns.

Aim: This study aimed to evaluate the effect of BDNF Val66Met polymorphism on adolescents' circadian patterns and cognitive performance on attention tests.

Methods: Eighty-five healthy high school students were included. All students were evaluated in the morning by the Psychological Battery for Attention Assessment, which assessed the ability to concentrate, and the divided and alternate attention. Students were categorized as carriers and non-carriers of the rs6265 polymorphism by using the TaqMan rt-PCR technique. Their chronotype profiles were classified as Morningness-Eveningness according to the score of Horne and Ostberg questionnaire. A subgroup of 42 students was objectively assessed for their sleep-wake habits, wearing an actigraph for nine days.

Results: Carriers of the BDNF polymorphism performed better than the non-carriers in the alternate task (107.23 ± 12.06 versus 98.65 ± 17.61 ; 95% CI = -0.74–15.0). No association was found between the presence of the r6269 polymorphism and the Morningness-Eveningness scale score (95% CI = -5.68–4.0). With regard to actigraphic results, the carriers of the polymorphism showed significant differences, compared with non-carriers, in the Total Sleep Time (6.48 ± 0.69 versus 5.97 ± 0.65 ; 95% CI = 0.038–0.98), Total Time in Bed (7.33 ± 0.63 versus 6.79 ± 0.80 ; 95% CI = -0.024–1.07) and Social Jet Lag (2.43 ± 0.95 versus 1.68 ± 1.04 ; 95% CI = 0.026–1.47).

Conclusions: The presence of BDNF polymorphism demonstrated a partial and counterintuitive impact on attentional performance, affecting only alternate attention. The genetic trait studied showed an impact on activity-rest rhythms, when objectively measured by actigraphy.

ID: 1286

Effects of a Mindfulness-Based Health Promotion Program on Sleep Quality, Light Exposure, and Circadian Markers in College Students

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Keywords

- ▶ sleep
- ▶ mindfulness
- ▶ circadian rhythms
- ▶ actigraphy
- ▶ college students

Introduction: College students are a population exposed to conditions adverse to their health, such as sleep irregularity, poor sleep hygiene, inadequate exposure to light, and circadian misalignment. Evidence has demonstrated the efficacy of mindfulness-based interventions in health promotion, including improving sleep quality.

Aim: To evaluate the effect of the Mindfulness-Based Health Promotion Program on sleep quality (subjective and objective), light exposure, and circadian markers (6-sulfatoxymelatonin and cortisol daily excretion profile).

Methods: A longitudinal, randomized, controlled trial with two parallel arms (experimental: Mindfulness-Based Health Promotion Program; control: Sleep Psychoeducation). Students enrolled at the Universidade Federal de São Paulo and Centro Universitário São Camilo with poor subjective sleep quality (Pittsburgh Sleep Quality Index score higher than 5) were included. The interventions consisted of eight weekly, one-hour meetings. Evaluations were done at three-time points: pre-intervention (ten days before the beginning of the intervention), during (between the third and fourth weeks), and post-intervention (one week after the end of the intervention) and were done by the Pittsburgh Sleep Quality Index (subjective sleep quality), actigraphy (objective sleep quality and light exposure rhythm) and urine analysis (6-sulfatoxymelatonin and cortisol).

Results: Twenty-five students composed the experimental group and twenty-two, the control group. No significant effect of any interventions on subjective and objective

sleep quality and light exposure were found. Regardless of the intervention, the time of cortisol excretion peak was later during the intervention than before it began. For 6-sulfatoxymelatonin excretion, the mindfulness-based group had a lower night/day ratio post-intervention when compared with the control group.

Conclusions: No significant effects of the Mindfulness-Based Health Promotion Program and the Sleep Psychoeducation on sleep quality (subjective and objective) and light exposure were found. We observed preliminary evidence of a mindfulness effect on 6-sulfatoxymelatonin secretion and, of both interventions, on cortisol excretion.

ID: 1287

Adherence and Care Results in Patients under Treatment with Positive Pressure Followed by Physiotherapy Protocol

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Keywords

- ▶ sleep apnea
- ▶ physiotherapy
- ▶ sleep technological device
- ▶ positive airway pressure

Introduction: Sleep apnea and its consequences such as cardiovascular and neuropsychological changes have been a constant target of studies to uncover better therapeutic paths and facilitate the routine of patients and health professionals.

Aim: The correct follow-up of patients undergoing treatment with positive airway pressure and the care management of the therapy can be predictive of better results and adherence. When associated with technological resources that aim to facilitate this process, the outcome can be even more decisive, as proposed in this study.

Methods: In the present study, from June 2021 to July 2022, the assistance intervention with follow-up of Physiotherapy was analyzed with 45 patients, monitored with gradual frequency at 1, 8, 15 and 30 days.

Results: The sample consisted mostly of men (71%), aged between 50 and 59 years (27%), with marked initial AHI, diagnosed in 68.75% of male patients and in 61% of patients in the women. After an average of 4 months of treatment using positive airway pressure and a follow-up physiotherapeutic protocol, in addition to a monitoring and adherence application, 87% of patients, men and women, migrated to normal AHI and the remaining 13% were diagnosed with light AHI.

Conclusions: The results found suggest that greater care in the follow-up of treatment and after acquisition of equipment intended for intervention with positive pressure have an assertive relationship with regard to better adherence and success in the programmed supervision of physiotherapy and resources destined to technological support.

ID: 1289

The Importance of Titration of Positive Pressure Devices in the Treatment of Obstructive Sleep Apnea – Emergence of Central Sleep Apnea (TECSA)

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Keywords

- ▶ obstructive sleep apnea
- ▶ central sleep apnea
- ▶ continuous positive airway pressure

Introduction: The first choice for the treatment of severe and moderate Obstructive Sleep Apnea Syndrome (OSAS) are positive airway pressure (PAP) devices. Even with optimal treatment pressure titration, central events may increase or arise in some patients. Treatment-Emergent Central Sleep Apnea (TECSA), also called Complex Apnea, occurs in 5–15% of OSAS patients on PAP therapy. Clinical predictors are not well understood in the development of TECSA, thus noting that some characteristics such as higher central apnea index, lower SpO₂, high loop gain phenotype, lower sleep efficiency, lower N3 sleep stage and higher sleep and REM latencies can be observed, both in diagnostic polysomnography and in titration polysomnography.

Aim: To emphasize the importance of titration of PAP devices, to try to minimize the risk of TECSA.

Methods: Data were obtained from the patient's medical record, authorized and signed by the patient in the informed consent form.

Results: Female, 47 years old, BMI 50.43 kg/m², with severe bronchial asthma, bipolar disorder for 15 years, using lithium, quetiapine and clonazepam. She has been snoring, witnessed apneas, daytime hypersomnolence and worsening dyspnea (mMRC 4) for 2 years. Diagnostic polysomnography with an AHI of 15.7/hour with obstructive events with oxyhemoglobin desaturations (35% of TST with SpO₂ < 90%) and an awakening rate of 30/hour. Indicated for VPAP titration in the sleep laboratory. The patient returned with slurred speech and attention deficit for the last 15 days after starting the use of automatic VPAP, with factory settings, 1.5 months ago, without having performed the requested PAP titration. Reading the VPAP card showed the appearance of TECSA. After adjusting the pressures, there was an improvement in the symptoms and resolution of TECSA.

Conclusions: In this case, initiation of VPAP was associated with the development of cognitive symptoms that may be related to the appearance of TECSA. The acquisition of PAPs, without proper titration of the ideal pressures for the treatment, is increasingly frequent due to purchase over the internet, without a prescription, and can lead to an increase in the prevalence of TECSA. Therefore, sleep laboratory titration should remain the gold standard to minimize risk, especially in patients with predisposing factors.

ID: 1290

Late Effects of Therapeutic Caffeine Use on Premature Children's Sleep

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Keywords

- ▶ sleep
- ▶ caffeine
- ▶ preterm
- ▶ children

Introduction: Prematurity, characterized by the birth of the newborn before completed 37 weeks of gestation, might lead to adverse consequences, not only in the immediate neonatal period, but also in infancy, adolescence and adult life. The apnea of prematurity is a condition that affects premature neonates and its main therapeutic resource is caffeine. While this substance acts by competitively inhibiting adenosine receptors, caffeine decreases total time and quality of sleep and increases its latency.

Aim: To evaluate whether the administration of caffeine to treat apnea of prematurity in preterm newborns lately alters sleep habits in children aged between 5 and 10 years old.

Methods: Cross-sectional study in which parents of 87 children between 5 and 10 years of age answered the Children's Sleep Habits questionnaire (CSHQ). The study was conducted in person at the UNIFESP Preterm Clinic and remotely via Google Forms. The sample were categorized into 3 groups: term newborn (TN) ($n = 45$), preterm who were not treated with caffeine (PTNC) ($n = 20$) and preterm who were treated with caffeine (PTC) ($n = 22$).

Results: Children of the PTC group had total daily sleep time significantly longer than children of TN group ($10\text{h}24 \pm 1\text{h}08$ and $09\text{h}29 \pm 1\text{h}08$, respectively) and awakening significantly later on weekdays than children of TN group ($09\text{h} \pm 00\text{h}58$ and $07\text{h}43 \pm 1\text{h}15$, respectively). No significant differences were observed between the 3 groups for bedtime on weekdays, bedtime on weekends and time to wake up on weekends.

Conclusions: The results of the study indicated that caffeine administered in the neonatal period did not negatively affect the sleep habits of premature children who received this treatment during their infancy. It was also associated with a longer total daily sleep time and a late awakening during weekdays.

ID: 1291

Covid-19 Pandemic: A Barrier on College Students' Path to Falling Asleep?M. C. M. M. David¹, N. F. dos Santos², P. D. S. Pereira², M. D. S. Barreto², N. A. Dantas², G. R. Vieira¹, M. S. B. D. Mattos³, R. J. B. de Matos²¹Universidade Federal de Pernambuco, Recife, PE, Brazil²Universidade Federal do Recôncavo da Bahia, Santo Antônio de Jesus, BA, Brazil³Universidade Estadual da Paraíba, Campina Grande, BA, Brazil**Keywords**

- ▶ sleep
- ▶ insomnia
- ▶ pandemic
- ▶ COVID-19
- ▶ college students

Introduction: The pandemic has reduced face-to-face routines, increasing the time available for sleep. However,

concerns about the pandemic context could contribute to chronic stress and interfere with sleep.

Aim: To investigate the college students' perception of sleep impairment due to concerns about COVID-19 pandemic.

Methods: Study performed in 2021 with 825 Brazilian college students, of both sexes, between 18 and 58 years old. The study was approved by the Ethics Committee under registration: 36741020.3.0000.5208. An electronic form was used, in which participants responded to the statement: "Due to concern about the COVID-19 situation, I have sleep problems." College students were grouped into groups according to the answer: "never" (NV), "rarely" (RR), "sometimes" (ST), "often" (OF) or very often" (VO). The form also had other questions for characterizing the groups, such as age, gender, academic semester, class format, income, COVID-19 diagnosis, COVID-19 vaccination, and time to fall asleep (in minutes). The Kolmogorov-Smirnov normality test was applied, as well as the Kruskal-Wallis test, followed by Dunn's post-hoc test to compare the variables between the groups, considering $p < 0.05$.

Results: There was a predominance of females (69.6%), 23.0 ± 4.2 years old and 5.4 ± 2.9 academic semesters. Most were in emergency remote classes (69.7%) followed by remote + face-to-face classes (20.8%). Only 37.1% never had sleep problems due to concern about COVID-19; 49.4% had such problems rarely or sometimes; and 13.5% presented frequently or very frequently. There was no difference between the groups in terms of age and academic semester ($p > 0.05$). However, when analyzing the time to sleep onset, it was found that college students in the NV group ($31.4 \text{ min} \pm 109.3 \text{ min}$) needed less time to fall asleep than the other groups ($p < 0.001$). Furthermore, the OF ($60.1 \text{ min} \pm 67.4 \text{ min}$; $p < 0.05$) and VO ($74.9 \text{ min} \pm 87.8 \text{ min}$; $p < 0.01$) groups took longer to fall asleep than the RR group ($40.2 \text{ min} \pm 49.4 \text{ min}$).

Conclusions: Concerns about the COVID-19 context led to sleep impairments for most college students at least some time until the second year of the pandemic. The college students' perception about the pandemic, despite being heterogeneous, was associated with the time spent falling asleep.

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ID: 1292

A Break for Evening Chronotypes? Rest-activity Rhythm of College Students during the COVID-19 Pandemic

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Keywords

- ▶ chronotype
- ▶ chronobiology
- ▶ sleep
- ▶ pandemic
- ▶ students

Introduction: Several activities have been suspended and/or adapted due to the COVID-19 pandemic. College students, for example, had to adapt to emergency remote classes in the first year of the pandemic, which may have

changed their rest-activity rhythm according to the chronotype.

Aim: To evaluate the rest-activity rhythm according to the chronotype of college students during the COVID-19 pandemic.

Methods: Study performed in 2020 (M1; $n = 45$) and 2021 (M2; $n = 61$) with college students between 18 and 30 years old, both sexes, living in Campina Grande and Recife, Brazil. Complete 12-day actimetric data were collected to assess rest-activity rhythm, as well as data from the Horne and Ostberg Morningness-Eveningness Questionnaire to investigate chronotype. The Kolmogorov-Smirnov normality test was applied; Mann-Whitney test for analysis between moments; and the Kruskal-Wallis test, followed by Dunn's post-hoc test to evaluate the rest-activity variables according to chronotypes, considering values with $p < 0.05$. The study was approved by the Ethics Committee under registration: 36741020.3.0000.5208.

Results: There was a predominance of females (M1:77.8%; M2:70.5%), with 21.7 ± 2.2 (M1) and 22.7 ± 2.9 years old (M2), as well as the intermediate chronotype in both analyzed moments (M1:47.7%; M2:60.7%), followed by the evening chronotype (M1:38.6%; M2:26.2%), with no statistical difference when comparing the parameters between the moments. There was also no difference between the moments evaluated for the rest-activity rhythm. However, when analyzing the variables of the rest-activity rhythm according to the chronotypes, in M1, the evening individuals showed greater activity in the five least active hours (L5) when compared with the intermediate chronotype individuals ($p < 0.05$). In addition, the evening individuals showed a later activity acrophase than the morning individuals ($p < 0.05$) in M1. On the other hand, there was no difference for students evaluated in M2.

Conclusions: The activity of the evening college students was consistent with their chronotype in the first year of the pandemic, but with more restlessness during sleep. On the other hand, in the second year, the evening students presented the rest-activity rhythm similar to the other chronotypes.

Acknowledgment:

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ID: 1293

Pleasure to Nap, Good Mood to Live: Perception about Naps and the Mood of College Students during the COVID-19 Pandemic

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Keywords

- ▶ sleep
- ▶ mood
- ▶ pandemic
- ▶ anxiety
- ▶ depression

Introduction: Society's habits were modified during the COVID-19 pandemic, increasing the free time of some individuals, such as college students. Reducing face-to-face obligations has facilitated the possibility of intentionally napping during the day, but little is known about the influence of such habits on mood during the pandemic.

Aim: To investigate whether the napping habit is associated with anxiety, depression and stress symptoms in college students during the COVID-19 pandemic.

Methods: Study performed in 2020 with 291 college students from northeastern Brazil, of both sexes, between 18 and 33 years old. The following were used in the research: electronic form with questions about the napping habit and perception, State-Trait Anxiety Inventory to investigate anxious symptoms, Beck Depression Inventory to verify depressive symptoms and the Perception Stress Scale to verify the stress perception. The groups were delineated according to the "yes" and "no" answers to the questions about napping, as well as according to the "pleasure," "need" or "another reason" for napping. For statistical analysis, the Kolmogorov-Smirnov normality test, Mann-Whitney test and Kruskal-Wallis test, followed by Dunn's post-hoc test were applied, with a significance of $p < 0.05$. The study was approved by the Ethics Committee under protocol: 32360720.4.0000.5208.

Results: The age verified was 21.7 ± 2.8 years old, with a predominance of females (70.4%). 52.2% of college students had the napping habit, but there was no difference in mood between individuals who napped or not ($p > 0.05$). Among college students who napped, there were lower symptoms of trait (47.3 ± 12.7) and state (48.4 ± 12.6) of anxiety, as well as lower symptoms of depression (12.5 ± 8.5) and stress perception (21.2 ± 6.9) among individuals who napped intentionally ($p < 0.05$). As for the napping perception, college students who judged it as pleasure had lower symptoms of trait (48.2 ± 11.1) and state (48.5 ± 10.9) of anxiety and depression (12.8 ± 8.0) when compared with individuals who thought it was an act of necessity ($p < 0.05$).

Conclusions: College students who napped intentionally and for pleasure during the COVID-19 pandemic had lower symptoms of anxiety, depression and perceived stress.

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ID: 1295

Post-traumatic Stress Disorder and Sleep Disturbances after Kidnapping of a Bus on the Rio-Niteroi Bridge: A Case Series Report

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Keywords

- ▶ post-traumatic stress disorder
- ▶ acute stress disorder
- ▶ sleep
- ▶ polysomnography

Introduction: Post-traumatic stress disorder (PTSD) is the most common mental disorder resulting from a severe traumatic event, and can only be diagnosed after 30 days of the stressful event. Currently, there are few data in

the literature comparing sleep alterations that occur in the period before and after these 30 days, in the same individuals.

Aim: The aim of this study was to describe possible sleep disorders and psychiatric symptoms and to study the possible relationships between them in individuals who collectively experience a traumatic event. In addition, it intends to contribute to broadening and deepening knowledge on the subject, adding new data on the relationship between acute stress disorder, PTSD and sleep.

Methods: Ten victims were assessed a few days after the bus was hijacked on the Rio-Niterói bridge. They were residents of São Gonçalo/RJ, a historic population that was repeatedly exposed to all kinds of violence. Follow-up lasted between one and sixteen months. A sociodemographic profile was drawn and a periodic assessment of quality of life, mental health and sleep was performed (using the PCL-5, SF-36, THQ, BDI-II, BAI, ESE, PSQI and SCID-5-CV), in addition to the polysomnography.

Results: All participants had at least one sleep complaint at the first assessment, with insomnia and nightmares the most prevalent complaints. Four participants (female) had acute stress disorder (ASD). Two of these progressed to PTSD and 3 reported bizarre or trauma-related visual hallucinations within the first month. Overall, 4 participants developed PTSD and 7 required pharmacotherapy to treat PTSD, mood disorder, generalized anxiety disorder, and alcohol use disorder. The absence of anxiety symptoms a few days after the trauma, early psychiatric intervention and rapid correction of sleep disturbances were related to the non-development of severe mental disorders. Patients with a high number of traumatic events during their lifetime, a weakened social support network, long-term insomnia and nightmares, abusive use of alcohol, smoking, psychiatric comorbidities, poor adherence to early treatment, inadequate sleep hygiene or poor sleep quality had worse evolution.

Conclusions: The results of this study suggest that, in patients with ASD or PTSD, it is important to recognize possible protective and risk factors to initiate early psychiatric and sleep treatment and prevent chronification and worsening of the psychiatric condition.

ID: 1296

Is There a Third Villain in the Relationship between Migraine and Sleep Impairment?

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Keywords

- ▶ pain
- ▶ migraine disorders
- ▶ sleep
- ▶ circadian rhythm
- ▶ light

Introduction: Individuals with chronic migraine often report sleep problems. As one of the main symptoms of migraine is photophobia, less light exposure could

interfere with the sleep-wake cycle of patients with chronic migraine.

Aim: To investigate whether light exposure is associated with sleep quality in individuals with CM.

Methods: The study was performed with 46 individuals, 23 diagnosed with chronic migraine and 23 healthy individuals (ethical approval number: 92552318.6.0000.5208). They were submitted to 15 consecutive days with actimetry (analyzed using the COSINOR method in the El Temps software), to check the rest-activity rhythm and light exposure. At the end of this period, the Pittsburgh Sleep Quality Index was applied to assess possible complaints related to sleep. A multiple linear regression model with an interaction effect was applied to assess the association between the variables, considering $p < 0.05$.

Results: Individuals with chronic migraine had worse sleep quality (8.7 ± 2.6 , $p < 0.001$) than the control group (5.2 ± 2.3). Regarding the actimetric data, it was found that individuals with chronic migraine had a lower rhythmic percentage of light exposure over the days ($\%V = 4.6$, $p = 0.04$) when compared with the control group ($\%V = 7.1$). When applying multiple linear regression models with an interaction effect, it was found that a lower amount of light exposure over the days would be one of the predictors for the subjective impairment in sleep quality among individuals with migraine, specifically regarding the light exposure variables: mean estimated statistic over rhythm ($\beta = -0.02$; Error $\beta = 0.01$; $r^2 = 0.44$; $p = 0.03$) and amplitude of light exposure ($\beta = -0.01$; Error $\beta = 0.01$; $r^2 = 0.43$; $p = 0.04$).

Conclusions: Migraine could have an indirect action on sleep impairment presented by the individuals based on one of their classic symptoms, which is photophobia. This associated symptom would lead the individual to reduce their light exposure, with consequent desynchronization of the light oscillation system and poor sleep quality.

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ID: 1297

Sleep Quality and Burnout Syndrome in Military Police Officers

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Keywords

- sleep quality
- burnout
- military police

Introduction: Military police officers need to deal with life-threatening situations, extended shifts and high levels of physical and emotional stress that predispose them to poor quality of sleep and the risk of developing burnout syndrome.

Aim: To evaluate the association between sleep quality and burnout symptoms in military police officers in the southern region of Brazil.

Methods: A cross-sectional study was performed in March 2022 including police officers from a military section

who work directly with political authorities. Sociodemographic data were collected and the instruments the Index of Pittsburgh Sleep Quality (PSQI) and the Jbeili Questionnaire for Preliminary Identification of Burnout were applied to assess quality of sleep and burnout symptoms, respectively. Descriptive and association analysis were performed.

Results: Forty-one military police officers were included in the study. The mean age was 42.1 ± 7.3 years, 90.2% were male, 70.7% were Caucasian, 51.2% were soldiers and 29.3% reported sleep less than 6 hours per day. The mean PSQI score was 6.8 ± 3.8 points and 53.7% of the sample had poor quality of sleep according PSQI (scores higher than 5). Regarding burnout, 43.9% were considered with Burnout (Jbeili score > 40 points). When evaluating the relationship between burnout syndrome and sleep, there was a statistically significant correlation between Jbeili questionnaire score and PSQI score ($r = 0.513$; $p = 0.01$). We observed that among military police officers with poor sleep (PSQI > 5) the prevalence of burnout symptoms was twice ($66.7\% \times 33.3\%$) compared with those with good quality of sleep.

Conclusions: Military police officers have a high prevalence of Burnout symptoms and poor quality of sleep. Burnout symptoms were more frequent among those who had poor quality of sleep. Studies with larger samples need to be performed to confirm these results.

ID: 1299

Sleep Quality, Stress and Anxiety during the COVID-19 Pandemic: Implications for the Development of Psychiatric Diseases in the Elderly

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Keywords

- sleep
- social isolation
- psychiatric diseases
- COVID-19

Introduction: The COVID-19 Pandemic has been considered the greatest challenge facing humanity since World War II, threatening thousands of lives as well as bringing serious physical and psychological consequences.

Aim: The aim of this study was to understand the implications of social isolation in the elderly, its relationship with the disruption of circadian rhythm and its interaction with the risk of development neuropsychiatric diseases.

Methods: This was a cross-sectional study involving elderly people ≥ 60 years ($n = 91$) (CEP/UFRN, n.4,140,853), residents of Natal/RN, who answered scientifically validated questionnaires: Pittsburgh Sleep Quality Index (PSQI), perceived stress scale (PSS), hospital anxiety and depression scale (HADS) and the Berlin questionnaire, from August 2020 to May 2021.

Results: The results showed poor sleep quality in 84.6% of the elderly, 6.09 ± 1.6 hours of sleep/night, presence of nocturia (93.4%), intermittent sleep (90.1%) and frequent nightmares (79.1%), with higher PSQI scores for men ($p < 0.05$). High risk for Obstructive Sleep Apnea Syndrome (OSAS) was observed in 46.1% of the elderly, among whom 100% were obese (BMI > 30) and 81% were hypertensive. The HADS showed probable anxiety in 34.1%, and probable

depression in 25.3% of the elderly. There was a positive correlation between the PSQI and the HADS ($r=.413/r=.335$), between the HADS and the PSS ($r=.784/r=.622$) and between the anxiety and depression subscales ($r=.806$). The PSS showed that 90% of the elderly had high or moderate perceived stress. There was a significant difference in PSS between infected and non-infected by COVID ($p<0.05$), as well as a higher probability of anxiety and depression ($p<0.05$) among those infected.

Conclusions: In Conclusion, the most of the elderly evaluated had a disruption of circadian rhythm, and were classified as having poor sleep quality, and that there was an association with the development of psychiatric diseases, such as anxiety and depression. In addition, there was a relationship between poor sleep quality and perceived stress, and with the risk of developing OSAS. These data reinforce the importance of searching for solutions to control the main variables associated with the development of sleep disorders, as well as stress, anxiety and depression resulting from the COVID-19 pandemic.

ID: 1300

Sleep Parameters on Days with and without Paralympic Powerlifting Training and Their Relationship with Training Load

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Keywords

- ▶ para-athletes
- ▶ sports for persons with disabilities
- ▶ sleep
- ▶ training load and paralympic

Introduction: Since high-performance athletes often experience high physical and psychological demands, achieving optimal recovery in the training process is important in improving physical and cognitive performance. Among the aspects that optimize psychophysiological recovery and improve performance is sleep.

Aim: This study aims to compare the sleep parameters during the days with and without training of Paralympic powerlifting athletes, and to analyze the relationship between the training load and sleep of the same day.

Methods: Actigraphy was used to analyze the sleep parameters for 14 days (7 days with and without training) while Ratings of Perceived Exertion (RPE) analysis was used to assess training load. In addition, the Horne and Östberg chronotype questionnaire and the Epworth sleepiness scale were applied. The Wilcoxon test and *t*-test were used to compare sleep parameters between days with and without training. In addition, Spearman's correlation was used to analyze the relationship between sleep parameters and training load, considering a $p<0.05$.

Results: Athletes show a morning and indifferent chronotype and low daytime sleepiness. Sleep onset latency (SOL; $p=0.01$) was lower (average 5.3 minute faster), and total sleep time (TST; $p<0.01$) and sleep efficiency (SE; $p=0.01$) were higher (TST averaged 169 minute and SE 7% higher) on training days compared with non-training days. In addition, the TST of the night before the training days was positively correlated with the RPE of the following day ($p=0.03$; $r=0.40$), as well as the training volume was

negatively correlated with the SE of the same day ($p=0.05$; $r=-0.26$).

Conclusions: The main results of the present study demonstrate that athletes with physical disabilities slept more, took less time to sleep, and had greater SE on days with PP training, indicating positive effects of training on sleep parameters. Also, training volume was related to SE on the same day, indicating that a higher training volume is related to a lower SE. In addition, the TST of the night before training is related to the athlete's effort the next day, that is, an athlete who sleeps more can exert more effort. Therefore, it is important to assess and monitor sleep and training load to consider in PP training.

ID: 1301

Association between Sleep Quality and Pain Catastrophizing in Older Adults with Chronic Low Back Pain: Preliminary Data

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Keywords

- ▶ chronic pain
- ▶ backache
- ▶ catastrophization
- ▶ aged
- ▶ sleep quality

Introduction: There is a high prevalence of poor sleep quality in people with chronic low back pain (cLBP) and the aging process is marked by a progressively decrease in sleep quality. In addition to the several impacts of poor sleep on pain control mechanisms, it can also influence mood and irritability which may be associated with increased catastrophizing thinking toward pain symptoms.

Aim: To investigate the association between sleep quality and pain catastrophizing in older adults with cLBP.

Methods: This was a cross-sectional analysis from an ongoing cohort study. The sample consisted of 30 older adults who had non-specific cLBP. This study was approved by the UFMG ethical committee (49334621.2.0000.5149). Inclusion criteria: ≥ 60 years old and reporting LBP for ≥ 3 months. Exclusion criteria: significant cognitive decline (score > 4 in the Leganés Cognitive Scale), pregnancy, symptoms of specific LBP, and clinical signs of radiculopathy. The recruitment took place in a university project that offers free physical therapy treatment for elderly people with cLBP. Demographic data were collected and the individuals answered the Pittsburgh Sleep Quality Index (PSQI), the Pain Catastrophizing Scale (PCS), and the Visual Analogue Scale (VAS) for pain intensity. The Shapiro-Wilk test was performed to test the normality of the data and the Spearman's correlation was performed. The significant level was set at 0.05.

Results: The sample had a mean age of 70.1 ± 6.5 years, mean BMI of 26.7 ± 3.2 , mean VAS of 7.1 ± 1.7 , mean LBP duration of 112.3 ± 129.9 months. We found a positive correlation between PSQI and PCS scores ($r=0.673$; $p=0.00$), and a negative correlation between sleep efficiency and PCS score ($r=-0.385$; $p=0.03$).

Conclusions: The poorer the sleep quality and the lower the sleep efficiency, the more pain catastrophizing. Based on our findings, looking purely at the association between sleep and pain intensity is not recommended, but

it is also important to consider the relationship between sleep and coping with pain.

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ID: 1302

Relation between Mealtime, Sleep Quality and Anxiety Level in Undergraduate Students in São Paulo

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Keywords

- ▶ chrononutrition
- ▶ sleep quality
- ▶ anxiety and students

Introduction: Food intake later at night has been correlated with negative effects on sleep quality in humans. As the duration and quality of sleep are significant determinants of the mental health, we tested the hypothesis that students with better sleep quality and low anxiety have an earlier meal compared with those with poor sleep quality and high anxiety levels.

Aim: To verify the association of the time of the main meal and the last meal with sleep quality and anxiety levels in undergraduate students. A secondary aim was to verify the association of meal times with chronotype.

Methods: A cross-sectional study, performed using online forms was conducted at a private and a public college in São Paulo. The following questionnaires were used: MEQ, PSQI and Trait-State Anxiety Inventory (IDATE). To analyze the correlations between the results of the questionnaires and meal times, Spearman's linear correlation coefficient was used. For the other analyses, the chi-square test was performed.

Results: 162 students participated in the study. The morning chronotypes had dinner and lunch earlier than evening chronotypes and also scored lower for trait anxiety than evening chronotypes students. In addition, morning chronotypes practice physical activity more frequently than other chronotype. Those who considered breakfast as their main meal woke up earlier than those who considered lunch. Students who ate more late night showed higher trait anxiety scores and slept later than those who ate early, and sleeping later was also associated with trait anxiety and worse sleep quality. Younger students were more anxious than older students. No associations were found between time of last meal and sleep quality, but was found that with increasing BMI, there is worse sleep quality.

Conclusions: Individuals who have meals later usually are evening chronotypes, tend to be more anxious and start sleeping later, and those who slept later had a poor sleep quality, which was related to increased BMI.

ID: 1303

Impact of the COVID-19 Pandemic on the Sleep Quality of Students: A Meta-analysis and Meta-regression

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Keywords

- ▶ sleep quality
- ▶ COVID-19
- ▶ students
- ▶ sleep hygiene

Introduction: The isolation and social distance caused by COVID-19 pandemic mainly affected students in the performance of daily activities, since classes started to be in the online format. The sudden change in their routines, combined with the various factors involved in the situation of confinement, can impact several aspects of health, including the quality of sleep.

Aim: This systematic review aims to answer the following question: "What is the impact of the COVID-19 pandemic on the quality of sleep of students?"

Methods: An electronic search was performed in the databases EMBASE, LILACS, PubMed/Medline, Scopus, Web of Science, and in gray literature for articles published up to January 2022. Observational studies that assessed sleep quality through validated questionnaires, comparing moments pre- and post-COVID_x0002_19 pandemic, were included. The risk of bias was assessed using the Joanna Briggs Institute Critical Assessment Checklist. The Grading of Assessment, Development and Evaluation (GRADE) was used to assess the certainty of scientific evidence. Estimates of interest were calculated using random effects meta-analyses and possible confounding factors were meta-regressed.

Results: 18 studies were included in the qualitative synthesis and 13 in the quantitative synthesis. Considering the means obtained from the Pittsburgh Sleep Quality Index, an increase in the scores during the pandemic period was found [MD = -0.39; 95% CI = -0.72 - -0.07; I² = 88.31%]. This reveals a slight worsening in the sleep quality of these individuals. Risk of bias was low in nine studies, moderate in eight studies, and high in one study. The unemployment rate of Brazil explained in detail the heterogeneity of analysis. GRADE analysis showed a very low certainty of scientific evidence.

Conclusions: The COVID-19 pandemic may have a slight negative impact on the sleep quality of high school and college students, but the evidence is still uncertain. Socioeconomic factors must be considered when evaluating this outcome.

ID: 1304

The Effect of Maternity and Work Demand in Women's Sleep Pattern

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Keywords

- ▶ sleep
- ▶ maternity
- ▶ work
- ▶ women
- ▶ children

Introduction: The amount of sleep per night has been decreasing in the population over the years. Professional, domestic and social demands are factors known to disturb sleep and the quality of life. Mothers are at higher risk to develop sleep disturbance due to all these factors associated to maternity tasks.

Aim: The aim of this study was to analyze the effect of maternity and work in sleep pattern of women participants of the EPISONO 2007.

Methods: The sample consisted of 574 women that were submitted to one-night polysomnography (PSG) to collect information about sleep parameters. The participants responded to the following questionnaires: Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), The Morningness-Eveningness Questionnaire (MEQ), Insomnia Severity Index (ISI), Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI). The group of participants were distributed according to questions of having or not having children and working or not working. The statistical analysis used was Generalized Linear Model, considering the effects of interactions among the groups and covariation by age. Results were presented by mean and standard error.

Results: The sleep parameters from polysomnography indicated that women with children had statistically lower sleep efficiency ($80.9\% \pm 0.7$) compared with women without children ($84.6\% \pm 1.3$). Working women presented statistically lower sleep latency ($13.2\text{min} \pm 0.8$), N2 ($54.5\% \pm 0.4$) and wake after sleep onset (WASO) ($49\text{min} \pm 2.0$) in relation to the non-working group, $24.8\text{min} \pm 2.3$, $54.9\% \pm 0.7$, $77.2\text{min} \pm 4.0$, respectively. Working women also showed more REM sleep ($19.1\% \pm 0.3$) and higher sleep efficiency ($84.7\% \pm 0.6$) compared with non-working women (REM sleep = $17.2\% \pm 0.5$, SE = $76\% \pm 1.1$). The analysis of subjective sleep parameters demonstrated that women with children had statistically lower sleep quality (PSQI = 6.8 ± 0.2) and presented more insomnia (ISI = 8.5 ± 0.3), compared with women without children (PSQI = 6.1 ± 0.3 , ISI = 7.9 ± 0.6). The anxiety was statistically higher in women with children (BAI = 9.8 ± 0.5) compared with those without children (8.8 ± 0.5).

Conclusions: The results evidenced that having children affected women's sleep and increased anxiety and insomnia symptoms. Working improved the time to falling asleep and increased the amount of REM sleep in PSG of women, suggesting a possible rebound effect of sleep restriction resulted from long working hours.

ID: 1305

Sleep Quality of Surf Athletes

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Keywords

- ▶ surf
- ▶ sleep
- ▶ athletes
- ▶ questionnaires
- ▶ sport

Introduction: From the beginning of surf origin to the present day where there are a plethora of world events, surf athletes present different training routines and strategies for the practice of the modality. Therefore, it is important that surfers have good quality of sleep allowing the body to restore its functionality.

Aim: The aim of the study was to evaluate the sleep quality of surf athletes.

Methods: To achieve this objective, 41 surf athletes of both sexes answered questionnaires on sleep quality (Pittsburgh), chronotype (Morningness-Eveningness Questionnaire), sleepiness (Epworth), athletes' sleep behavior (Athlete Sleep Behavior Questionnaire), and finally, the surfers answered an anamnesis containing questions about health conditions, medication consumption, injury history and training routine. The questionnaires were answered by an online platform (google forms) after the athletes accepted the ethical conditions of the experiment.

Results: The results were first analyzed using the Kolmogorov Smirnov normality test and then the *t*-test for independent samples was applied. The sample consisted of 16 men and 25 women, and the general results of the sample ($n = 41$) showed a predominance of moderate morning chronotype (score 60), good sleep latency (23 minutes), good sleep efficiency (88%), Pittsburgh questionnaire score of 5 points, the athletes also did not have excessive sleepiness (8 points). Regarding the sleep behavior assessed by the ASBQ questionnaire, the athletes showed a moderate perception of the influence of sleep on their sports performance (37 points). When comparing the genders, we noticed a statistical difference in the time of practice of the sport, with a longer time of practice for males (18 years/men and 6 years/women). No statistically significant differences were found in the variables related to sleep quality for both genders.

Conclusions: Thus, in conclusion of this study it is possible to observe that surf athletes had a good quality of sleep, in addition to a predominance of the morning chronotype (60%), followed by indifferent (40%).

ID: 1306

Influence of Sleep, Socioeconomic and Psychiatric Factors in the Risk for Consumption of Tobacco and Alcohol

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Keywords

- ▶ sleep
- ▶ sociodemographic factors
- ▶ psychiatric symptoms
- ▶ substance use

Introduction: Evidence shows that sleep, psychiatric and sociodemographic factors can separately affect substance use. Considering the contribution of each of these elements, it becomes necessary to investigate its adjoined impact on the risk on substance use.

Aim: This study aimed at building models that include the three factors simultaneously, to verify how they contribute to the risk of substance use.

Methods: Volunteers from the EPISONO 2007, which was performed to investigate sleep patterns in the inhabitants of the city of São Paulo, Brazil, answered validated questionnaires regarding general health and underwent a polysomnographic exam. For the analyses here shown, scores in the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) were evaluated considering polysomnographic findings and answers to questionnaires assessing sleep, psychiatric and socioeconomic factors. Using structured equation modelling (SEM) a theoretical model was built, uniting construct variables corresponding to sleep, mental health and socioeconomic factors and linking them to ASSIST scores. Additional logistic regression analyses were performed to observe which variables pertaining to sleep, psychiatric and socioeconomic factors could be considered associated factors to substance use risk.

Results: 793 EPISONO participants (mean age = 43.4 years; 452 women) were included. A successful model was built for tobacco consumption risk. It was found that subjective sleep quality, psychiatric symptoms and socioeconomic status influenced ASSIST scores for tobacco consumption. The logistic regression analyses also identified effects of anxiety (OR = 1.07 [1.01 to 1.13]), on the alcohol consumption risk.

Conclusions: With our theoretical model, we successfully explained how sleep, mental health and social factors could form a network affecting tobacco consumption risk. However, models for other substances could not be built. This impossibility may be connected to the nature of our sample, which was a screening of the general population of large urban center, and therefore include a limited amount of individuals with a higher risk in substance use. Using logistic regression, effects of mental health factors were seen acting on alcohol consumption risk, suggesting more similar studies are performed using specific population samples.

ID: 1309

Sleep Pattern and Metabolic Syndrome in Young Adults: Data from the Epidemiological Sleep Study (EPISONO)

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Keywords

- ▶ sleep
- ▶ metabolic syndrome
- ▶ insulin resistance
- ▶ polysomnography

Introduction: During the last decades, both sleep pattern and eating habits have undergone significant changes in the daily life of society, contributing to chronic degenerative diseases. These changes lead to an increased risk of obesity and development of Metabolic Syndrome.

Aim: To investigate the association between Metabolic Syndrome and sleep pattern in adults.

Methods: Data were obtained from the Epidemiological Sleep Study (EPISONO), which evaluated the sleep pattern of a representative sample of Sao Paulo (Brazil), in 2007. Among 1,042 individuals, 452 aged between 20 and 45 years were selected, considering age with the lowest prevalence of Metabolic Syndrome. Research participants were allocated into 2 groups: 345 in control group, who did not present any risk for Metabolic Syndrome, and 107 in the Metabolic Syndrome group, who presented at least 3 of the 5 criteria for the diagnosis of Metabolic Syndrome, according to the criteria of the National Cholesterol Education Program - Adult Treatment Panel III (NCEP-ATP III). Pittsburgh Sleep Quality Index, biochemical tests and overnight polysomnography were evaluated.

Results: Compared with the control group, the Metabolic Syndrome group showed a significant increase in N1 sleep stage, longer wakefulness after sleep onset, and a higher apnea and hypopnea index. There was a positive correlation between the presence of obstructive sleep apnea (OSA) and the Metabolic Syndrome, with an incidence of apnea of 8.8% in the control group and 56.1% in the Metabolic Syndrome group. Regarding the biochemical markers, the Metabolic Syndrome group presented high level of HOMA-IR, C-Reactive Protein, LDL, triglycerides, and blood glucose, and decreased HDL values, when compared with the control group.

Conclusions: Metabolic Syndrome was linked with a high incidence of apnea and hypopnea index, worsening in the sleep quality and pattern, and enhanced of inflammatory conditions. Our data demonstrate that Metabolic Syndrome significantly associated with sleep patterns even in young adults. The search for prevention and health maintenance is relevant to avoid the progression of chronic diseases with age.

ID: 1310

Clarithromycin Treatment in Kleine-Levin Syndrome: Two Case Reports

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Keywords

- ▶ kleine-levin
- ▶ hypersomnia
- ▶ clarithromycin
- ▶ methylphenidate

Introduction: Kleine-Levin syndrome is a rare syndrome characterized by recurrent episodes of hypersomnia lasting from days to weeks, associated with cognitive and behavioral dysfunction, hyperphagia, and hypersexuality, interspersed with periods of normal functioning. There is no definitive treatment established. The use of clarithromycin was previously suggested, due to the GABA-A antagonistic properties.

Aim: Report of the effect of clarithromycin on two patients with Kleine-Levin syndrome.

Methods: Retrospective chart review.

Results: Both patients were evaluated at HC-FMUSP-RP. Case 1: first episode of hypersomnia and hyperphagia occurred at 16 years old. The clarithromycin was started on 9th day of symptoms. There was gradual clinical improvement with suspension of medication after 32 days. Three years later there was a new episode, associated with hypersomnia, hyperphagia and mental confusion, with spontaneous improvement after 2 days. After 3 years, a new hypersomnia episode was associated to cognitive dysfunction. Clarithromycin was started on day 13, with gradual symptomatic improvement. Clarithromycin was maintained for 60 days until resolution of symptoms. Case 2: first episode at age 16, with monthly recurrent episodes of hypersomnia associated with hyperphagia, cognitive dysfunction, and anterograde amnesia. After introduction of methylphenidate, the patient remained symptom-free for 1.5 years, when he had a new episode after methylphenidate withdrawal. Due to the lack of response to methylphenidate during this new episode, it was stopped on day 8. After 13 days period, the condition spontaneously resolved. Two months later, a new episode of hypersomnolence, psychomotor slowing and hyperphagia was registered. Clarithromycin was started on the 7th day, with total improvement after the third dose. The patient discontinued it the next day. After one month, methylphenidate was re-started and patient is asymptomatic until the present date.

Conclusions: In our cases the response to clarithromycin was not clear-cut as previously observed. There was a response variability to clarithromycin between symptomatic episodes in case 1 and from patient-to-patient. Drug-response evaluation may be hindered by the self-limited nature of the symptomatic episodes of Kleine-Levin Syndrome. It is noteworthy the methylphenidate positive effect on symptom prevention in case 2, despite no benefit during the symptomatic period.

ID: 1311

GABAergic Circuits as Common Pathways Disrupted in the Genetic Basis of Sleep Phenotypes and Rare Neurodevelopmental Disorders

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Keywords

- ▶ sleep
- ▶ neurodevelopment
- ▶ GABA
- ▶ genetic risk

Introduction: Sleep-related phenotypes have been frequently reported in neurodevelopmental disorders (NDD), with special emphasis in autism spectrum disorder (ASD), yet the convergent pathogenetic mechanisms between these comorbidities are largely unknown. Recent efforts on large genomic datasets have shown shared genetic risk that link psychiatric and sleep traits; however, the neuronal circuits affected by these genetic variants remain to be discovered.

Aim: We performed a gene enrichment study that (1) identified risk genes that contribute to both NDD/ASD and sleep phenotypes and (2) determined cellular and molecular pathways enriched among these shared genes.

Methods: We manually curated two sets of genes, one associated to neurodevelopmental phenotypes and the other to sleep phenotypes (e.g., insomnia, narcolepsy, sleep duration, chronotype, among others). The later gene list was heavily driven by hits in genome-wide association studies, while the first gene list was based on genes that reached genome-wide significance in the two largest NDD/ASD exome studies performed to date. Using Fisher's exact test and considering a total 21,196 genes in the human genome, we tested the statistical significance of the overlap between these two gene lists and generated a third gene list containing their intersection. Benjamini-Hochberg test, adjusting for multiple comparisons, was used to identify enriched Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) terms that were over-represented among the intersect gene list.

Results: There were 41 overlapping genes between the gene list associated to sleep phenotypes (1,064 genes total) and the gene list associated to NDD (307 genes total), indicating significantly more overlap than expected by chance (p value = $1.1e-8$, OR = 3.0). Among the top significantly enriched terms on these 41 intersect genes are GABAergic synapse (p value = 0.004, OR = 25.3, KEGG), GABA receptor complex (p value = 0.004, OR = 60.1, GO:1902711), GABA-gated chloride ion channel activity (p value = 0.005, OR = 93.0, GO:0022851), and GABAergic receptor activity (p value = 0.008, OR = 51.1, GO: 0016917).

Conclusions: An over-representation analysis identified several enriched pathways that suggest GABAergic circuits as potential shared mechanisms between sleep phenotypes and NDD. This overlapping gene set and the highlighted biological pathways may serve as a preliminary stepping-stone for new functional investigations of sleep and NDD/ASD shared genetic mechanisms.

ID: 1313

Mutational Mechanisms Linking GRIN2A to Epileptic Encephalopathy Events during Sleep

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Keywords

- ▶ sleep
- ▶ GRIN2A
- ▶ epilepsy
- ▶ Landau Kleffner Syndrome
- ▶ epileptic encephalopathy with diffuse continuous spike
- ▶ waves during slow
- ▶ wave sleep

Introduction: GRIN2A rare coding variants are one of the main genetic factors associated with phenotypes in the epilepsy-aphasia spectrum, such as Landau-Kleffner syndrome (LKS) and epileptic encephalopathy with continuous spike-waves during sleep (ECSWS). These conditions cause recurrent epileptic seizures and impairment of language skills. Their most distinctive feature are characteristic patterns of abnormal electrical brain activity during slow wave sleep.

Aim: We evaluated the divergencies and commonalities between molecular disruptions associated with different mutational mechanisms affecting GRIN2A in patients on the epilepsy-aphasia spectrum.

Methods: We systematically reviewed all articles published in the past 10 years that reported GRIN2A variants associated with epilepsy-aphasia spectrum disorders. From a total of 11 publications, we selected pathogenic or likely pathogenic missense variants affecting the most important protein domains coded by this gene (i.e., glutamate binding (GB) and pore-forming (PF)) and their flanking regions. Prediction scores from protein damaging effects of 23 variants, reported in a total of 59 patients, and gnomAD populational dataset were used to define protein regions that are conserved against gain and function (GoF) and loss of function (LoF) variation.

Results: 13 variants were detected in more than one patient, of which 7 were inherited, indicating incomplete penetrance, and 6 were de novo. GB was the most affected protein domain, harboring 15 variants, followed by PF, with 8 variants. The most frequently reported phenotypes were rolandic epilepsy, CSWS and LKS. The GB domain was associated with multiple epileptic encephalopathy phenotypes, while PF was found to be mostly associated with CSWS. 4 GB-region variants were reported among exome and/or genome samples on gnomAD, of which 3 were reported as inherited. From variants with functional validation, 15 were LoF, with all of them affecting GB, with equal rates of de novo and inherited heritability. All 3 GoF variants were associated with the PF domain and reported to be de novo.

Conclusions: The mutational mechanisms acting on GB and PF domains diverge on penetrance, protein activity effects and clinical consequences. Dissecting the molecular consequences of disease-relevant missense variants can lead to precise functional modeling and precision medicine approaches.

ID: 1314

Association between Prostatic-specific Antigen and Obstructive Sleep Apnea in the EPISONO Study

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Keywords

- ▶ sleep
- ▶ obstructive sleep apnea
- ▶ prostatic-specific antigen
- ▶ oxygen saturation

Introduction: Obstructive sleep apnea (OSA) is related with several physiologic alterations. The participation of sleep disturbances in the pathways related to the development of cancer has been investigated. The prostatic-specific antigen (PSA) is the main marker in preventive exams against prostatic tumors, although its biological role is still debated.

Aim: To evaluate the effects of OSA on free PSA levels.

Methods: This is a cross-sectional study using a secondary database from the São Paulo Epidemiological Sleep Study (EPISONO) study, 3rd edition, performed in 2015. The sample contains 149 older men (≥ 50 years old). The following variables were considered as predictors in the multivariate linear regression analysis: OSA severity groups (normal, mild, moderate, and severe), respiratory disturbance index (RDI), apnea hypopnea index (AHI), and percentage of sleep time with SpO₂ below 90% (SpO₂ < 90%). Free PSA level was the dependent variable. Pearson's correlation and regression were performed in Jamovi (2.2.3), and the statistical significance threshold was set at $p < 0.05$.

Results: The multivariate linear regression model with the four predictors was statistically significant ($\beta = 0.57$; IC95% [0.21–0.94]; $p = 0.002$). The SpO₂ < 90% was statistically significant for the model ($\beta = 0.014$; IC 95% [0.006–0.02]; $p < 0.001$), i.e., free PSA levels increase by 0.014 ng/mL with each increased unit of SpO₂. No significant differences in free PSA levels among any of the OSA severity groups were observed. There was no statistical significance in the parameters RDI ($\beta = -0.02$; IC 95% [-0.09–0.04]; $p = 0.447$) and AHI ($\beta = 0.02$; IC 95% [-0.04–0.09]; $p = 0.53$). A positive correlation was observed between free PSA levels and SpO₂ < 90% ($r = 0.305$; IC 95% [0.152–0.444]; $p < 0.001$).

Conclusions: Results showed that SpO₂ < 90% may be associated with free PSA levels, independently of OSA severity groups.

ID: 1315

Latent Class Analysis of Multiple Parameters of the Individual Socioeconomic Context on Sleepiness

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Keywords

- ▶ sleep
- ▶ sleepiness
- ▶ socioeconomic status

Introduction: Recent studies highlight the importance of the social, economic, and demographic environment in which individuals live to sleep health. Sleep

health has an unequal distribution in the population, especially considering factors such as workload, race, and socioeconomic status. An important aspect of sleep health is sleepiness, and evidence indicates the association between social parameters and excessive daytime sleepiness, which is prevalent in our society.

Aim: To analyze whether latent variables can be extracted from multiple socioeconomic and demographic variables and check if those constructs have any effects on sleepiness in a representative sample from the population of São Paulo.

Methods: Participants from the São Paulo Epidemiologic Sleep Study (EPISONO) – 3rd edition (2007) answered the following questionnaires: Epworth Sleepiness Scale (ESS), Brazil Economic Classification Criteria (CCEB), marital status, household income, working status (worker, student, none or both), number of jobs, weekly work hours, and self-declared race. Latent variables (or classes) were extracted from the questionnaires results using latent class analysis (LCA). The association between ESS and latent classes was tested utilizing generalized linear models (GLM). The statistical significance criterion was set at $p < 0.05$.

Results: LCA resulted in 3 factors being extracted, with a 74% entropy value, indicating a reasonable accuracy of the class definition. Class 1 had predominantly whites, those who had high CCEB and income, and thus named “high socioeconomic status.” Class 2 evidenced a high percentage of non-working (70%) women (75%) with diverse races and middle to low income and education, and thus named “non-workers.” Class 3 also presented middle to low income, CCEB, and multiple races, but 93% were workers with 40 or more weekly work hours. Thus, Class 3 was named “workers.” GLM verifying the effect of latent classes on ESS resulted in Class 2 showing a single statistically significant association with a statistically significant lowered ESS score.

Conclusions: Latent class analysis resulted in 3 latent classes, “high socioeconomic status,” “non-workers” and “workers.” “Non-workers” showed a negative significant association with sleepiness, suggesting that absence of work combined with middle to low income was related to lower ESS. A measurement model of socioeconomic variables was built, strengthening the hypothesis that the social context is linked to sleep health.

ID: 1316

Pain during the Night and Its Association with Quality of Life in Women: Data from the Epidemiologic Sleep Study (EPISONO)

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Keywords

- ▶ sleep
- ▶ quality of life
- ▶ pain
- ▶ women
- ▶ polysomnography

Introduction: Sleep deprivation is associated with pain, even though this relationship has not been fully clarified. Women with pain present a reduction in sleep

duration and quality of life, but the consequences of pain experienced at night are still open.

Aim: The goal of this study was to investigate and to compare levels of anxiety, depression, and fatigue in women with pain during the night with those without pain. Our hypothesis was that pain perception was associated with the worsening of fatigue and mood.

Methods: This cross-sectional study used data from the 2007's Epidemiologic Sleep Study (EPISONO). From the 574 women who took part in the EPISONO, a total of 244 women aged 20–80 years met the inclusion criteria, 82 in the pain group and 162 in the control group. The groups were distributed according to the presence of pain during the night, self-reported from both the Pittsburg Sleep Quality Index (PSQI) and the Pre-Sleep Questionnaire (PSQ). The participants went through a full night laboratory polysomnography, and completed questionnaires related to fatigue, depression, anxiety, and quality of life. All analyses were performed using the SPSS software version 26, with Bonferroni adjustment.

Results: The pain group had a significantly lower perception in all domains of quality of life, and significantly higher levels of fatigue (5.4 times), anxiety, and depression, compared with the control group. Pain perception was also correlated to levels of anxiety and depression in the psychological ($R_s = -0.463, -0.607$, respectively) and social ($R_s = -0.423, -0.438$, respectively) quality of life domains.

Conclusions: Pain during the night in women contributes to decreased quality of life and may worsen mood disorders and fatigue. Our data shows the importance of investigating pain and its deleterious effects, as well as women's sleep patterns.

ID: 1321

Is There an Association between Physical Activity, Low Back Pain and Sleep Quality? Cross-Sectional Study with Participants Aged 60 Years and Over

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Keywords

- ▶ sleep
- ▶ physical activity
- ▶ older adults
- ▶ pain

Introduction: Low back pain (LBP) is among the main causes of years lived with disability, in addition to being closely associated with the aging process. Physical activity contributes to the improvement of sleep quality and the symptoms of LBP. However, few studies about the association between LBP and physical activity on the sleep pattern among older adults have been performed.

Aim: To investigate the relationship between physical activity, LBP and sleep quality in the older adults.

Methods: Older adults aged 60 years or older and who reported symptoms of LBP for at least 3 months were included, through self-report after the question “have you had pain in the last 3 months?,” as answer options: yes or not.

Physical activity was assessed with the Modified Baecke questionnaire for the older adults, and the classification was made based on percentile. Those above the 75th percentile were considered active, and the remaining were considered inactive. Sleep quality was evaluated with the Pittsburgh Sleep Quality Index. Those who scored between 0 and 7 were grouped as a good sleeper, and above 7 as a poor sleeper.

Results: A total of 504 older adults participated in this study and the results found that 45% had LBP, 53% had poor sleep quality and 83% were inactive. Logistic regression analysis showed that there was no relationship between having poor sleep quality compared with those without LBP ($p > 0.05$ [95% CI]). There was no significant effect of physical activity on the sleep of the elderly.

Conclusions: Older adults with low back pain were not more likely to have worse sleep quality and no effect of physical activity on sleep quality was observed.

ID: 1322

Aspects of Sleep during the COVID-19 Pandemic in Individuals with Chronic Obstructive Pulmonary Disease: Results of a Longitudinal Study

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Keywords

- ▶ obstructive chronic pulmonary disease
- ▶ sleep
- ▶ pandemic
- ▶ COVID-19

Introduction: Previous work suggests that the COVID-19 pandemic negatively affected sleep. People with chronic obstructive pulmonary disease (COPD) are known to present sleep complaints, which could also get worse during the pandemic.

Aim: To analyze the impact of COVID-19 pandemic on sleep in individuals with COPD.

Methods: Sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI) and by the Actiwatch sleep monitor for seven consecutive days. Pulmonary function was assessed using a portable spirometer. Visits were conducted in two moments: first in September-October/2020 (when rigorous measures of social isolation were implemented) and the second in June-July/2021 (immediately after the relaxation of social isolation measures as officially announced by national government institutions).

Results: Fourteen individuals with COPD were evaluated (8 men; median age 67 [65–72] years; FEV1 60 [41–66]% predicted; BMI 27 [24–30]kg/m²). In comparison to the first visit, individuals presented in the second visit lower sleep efficiency (94 [91–96] versus 85 [77–90]%, $p = 0.005$), longer awake time after sleep onset (28 [13–50] versus 72 [46–91] min, $p = 0.006$), higher number of sleep bouts (23 [14–38] versus 40 [32–53] bouts, $p = 0.007$), higher number of wake bouts (22 [13–37] versus 39 [31–52] bouts, $p = 0.007$) and longer duration of these waking blocks (1.09 [0.97–1.18] versus 1.80 [1.2–2.2]min, $p = 0.023$). Sleep quantity was similar in both visits (7.8 [7.1–8.6] versus 7.4 [6.4–7.9] hours, $p = 0.055$). Twelve (86%) patients reported a reduction in medical consultations at visit 1 because of the pandemic, and 4 (29%) patients reported worsening of respiratory symptoms at visit 2 compared with visit 1. No statistically

significant changes were observed when comparing the total PSQI score between visits 1 and 2.

Conclusions: During the COVID-19 pandemic, individuals with COPD presented a worsening of sleep quality, with reduced sleep efficiency and greater sleep fragmentation. Reduction of medical consultations and increase in respiratory symptoms were also reported, but more research is needed to investigate the associations of these findings. Results indicate that sleep evaluation and management should be encouraged in this population.

ID: 1327

Relationship between Sleep Duration and Risk of Fallings in the Elderly: Results from a Systematic Review

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Keywords

- ▶ sleep duration
- ▶ fall
- ▶ elderly
- ▶ actigraphy

Introduction: Aging is responsible for several changes on distinct sleep dimensions turning it less deep, more fragmented and restricted on duration when compared with previous adulthood scenarios. Increased sleepiness and daytime napping are often related to the increased likelihood of falling, which may lead to bone fractures and increased mortality rate. Studies show that as age increases, the number of falls rises up. Whether sleep duration may be a mediator of such relationship it is unclear.

Aim: To evaluate the association between sleep duration and the risk of falling in elderly.

Methods: A systematic review was performed between February 4th and April 3rd, 2022, using the keywords: “sleep duration” AND “elderly” AND “falls” AND “actigraphy.” Electronic databases and manual searches were used. The inclusion criteria was: elderly of both sexes aged > 65 years; presence of actigraphy to assess hours of sleep; questionnaire to assess the risk of falling. Exclusion criteria: animal studies, literature review, systematic review, meta-analyses, letters, abstracts, and conference proceedings.

Results: A total of 631 studies were found, of which 4 met the eligibility criteria. The samples ranged from 874 to 3101 participants (total $n = 8008$), with ages ranging from 76.4 ± 5.5 to 83.5 ± 3.8 years. It was observed that 1478 participants fell. These individuals were splitted in two groups according to their objective sleep duration: < 7 hours, from which 970 fell; and between 7 and 8 hours, from which 508 fell. Stone et al., 2008 and Stone et al., 2014 reported that participants who fell were likely to have short hours of sleep. Swanson et al., 2019 observed a tendency for a higher percentage of falls in the group that slept > 9 hour. However, Swanson et al., 2021 showed no association between sleep and increased risk of falls.

Conclusions: This study provides evidence supporting the relationship between sleep duration and the likelihood of falling in older adults. Meanwhile, future research should focus on possible mediators that can be integrated into clinical algorithms for the prevention and treatment of sleep disorders.

ID: 1329

Gut Microbiome, Irritable Bowel Syndrome and Obstructive Sleep Apnea: An Overview on this Interaction

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Keywords

- ▶ sleep
- ▶ sleep disorders
- ▶ obstructive sleep apnea
- ▶ gut microbiome
- ▶ irritable bowel syndrome

Introduction: Sleep disorders, including obstructive sleep apnea (OSA), may play a role in gastrointestinal disturbance and dysmotility, affecting the microbiome and gut hormonal regulation. Irritable bowel syndrome (IBS) is a condition that affects the large intestine, in the absence of any organic reasons.

Aim: This analysis aimed to describe and evaluate updates on this triple relationship (OSA, IBS and gut microbiome), which may guide future directions to this research line.

Methods: A search strategy was adopted and a literature review was performed through the electronic database PubMed. Review articles that linked directly or parallelly this association were included in this narrative analysis. Combined terms were used including “and” to refine the search. The term “sleep apnea and gut microbiome” produced 7 articles, and “sleep apnea and irritable bowel syndrome” 1 article. From the term “irritable bowel syndrome and gut microbiota,” a total of 15 of the most recent articles (past 5 years) was considered worthy to support our work.

Results: The IBS may be associated with dysbiosis and signaling imbalance of the gut-brain axis. This axis is a bidirectional link between the endocrine, immune and autonomic neural systems, which classically influence bowel motility and the gut microbiota. Several substrates, including cholecystokinin, vasoactive intestinal peptide, substance P and neuropeptide Y, contribute to the physiological regulation of the bowel tract. The altered gut microbiota may suffer influence of gut peptides, and lead to gastrointestinal disruption. As these substrates may be mediated by immune and neuroendocrinological pathways, and may regulate brain-gut neurotransmission, the role of sleep should be emphasized in this interaction, including the possible involvement of OSA in gut microbiota changes. Poor sleep resulting from OSA may dysregulate the gut-brain axis, which can impair the individual's microbiome and increase IBS severity. Substance P (related with pain and higher sensibility) may influence the hypoxia in OSA, and altered levels of this peptide were described in cases of excessive daytime sleepiness in OSA.

Conclusions: Further experimental and clinical studies could provide better understanding of the relationship between IBS and OSA, and sleep in general; and help to promote better management of any disturbance to the gut microbiome and bowel regulation.

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ID: 1330

Sleep Dentistry Improving School Performance and Child Development

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Keywords

- ▶ sleep dentistry
- ▶ cross bite
- ▶ development

Introduction: This work is based on the clinical results of an 8-year-old male patient, with crossbite, use of artificial teats such as a pacifier and bottle from birth to 3 years of age and with growth difficulties, poor sleep with complaint of snoring and movements night when associated with mouth breathing, shows the importance of sleep dentistry integrated with a multiprofessional network to change and improve the pattern of both breathing and occlusion.

Aim: Demonstrate how sleep dentistry associated with pediatric dentistry promotes fantastic results for the improvement of general health and balance of functions in pediatric patients.

Methods: Assessing the need to recover both masticatory and respiratory functions, it was necessary to use an orthopedic device since the atresic palate reduces the spaces of the upper airways and due to the use of artificial nipples, the open bite prevents lip sealing. The patient had a change in the correct growth of the arcades, which directly impacts breathing and, therefore, changes in sleep, since he has a much greater difficulty in reaching the REM stage, a fundamental stage of sleep both for recovery and assimilation of information and for the release of growth hormone. As a result, complaints of school performance and lack of attention during classes. We know that breathing without the nasal route is directly related to the reduction of oxygen in noble areas such as the brain, contributing to greater dispersion.

Results: After one year of treatment, it was possible to evaluate both the aesthetic correction and the improvement in the growth and development of the face and bite correction. Regarding the respiratory process after correction of the jaws and open bite, it was possible to perform lip sealing and thus correct breathing, position of the tongue and hyoid bone. The mother reported a much “quieter” sleep, after the first 6 months of treatment, it was noticed that frequent snoring became sporadic and with these changes a direct interference in better school performance.

Conclusions: Dentistry today has an extremely relevant importance in the treatment not only of the disease, but in the maintenance of health and the balance of functions in the human body. Preventive treatment from pediatric dentistry specializing in this vision of sleep promotes a direct interference in the development and quality of life.

ID: 1332

Maternal Depression at Six Month of Baby's Life: Fatigue and Sleep Disturbance

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Keywords

- ▶ depression
- ▶ maternity
- ▶ disorders

Introduction: The transition to motherhood, especially when it comes to the first child, is associated with important individual (physical and psychological) and social changes, which can be observed in different contexts. Emphasizing the psychological aspects, authors such as Winnicott have suggested that with motherhood the woman enters a special psychic condition that puts her in a state of great emotional availability for the baby, promoting a good enough environment and the healthy development of the child.

Aim: The present study investigated the presence of indicators of depression in mothers with babies at six months of age.

Methods: The study included 24 mothers aged between 16 and 39 years, of different socioeconomic levels who lived with the baby's father and participated in the Family Health Program in the city of Santo Antônio de Jesus (Bahia – Brazil). The Beck Depression Inventory (BDI) and a Diagnostic Interview detected 13 mothers showing indicators of depression, reaching a moderate level of depression (group I), and 11 mothers not showing indicators of depression (group II). The Diagnostic Interview was used with all mothers, to complement the results obtained through the BDI. Content analysis was used to analyze the interviews. The mothers' responses were categorized based on three thematic axes of depression indicators according to the BDI, such as feelings of tiredness, perception of sleep disturbance, and feelings of concern about the body.

Results: The results found drew attention to the similarity between the groups in relation to the analyzed categories, with no difference between the mothers. Through the BDI, the mothers of both groups showed indicators of depression such as tiredness; sleep alteration; and concern for the body.

Conclusions: The results were discussed based on Winnicott's theory of motherhood and the value of depression in the sense of emotional development toward maturity and autonomy. Physical disorders on the puerperal stage like sleep disturbance and others need more attention from researchers.

ID: 1340

Fragmented Sleep, Nocturia and Sustained Desaturations are Associated to the Risk of Falling in Elderly: Results from a Systematic ReviewC. M. Guimarães¹, C. M. C. C. Dias¹, M. G. M. Cruz^{1,2,3}, C. Salles^{1,4,5}¹Bahiana School of Medicine and Public Health, International Center of Clinical Sleep Medicine and Research, Salvador, BA, Brazil²Sleep Unit, Cardiovascular Center of the University of Lisbon, Lisbon School of Medicine, Lisbon, Portugal³European Sleep, Portugal⁴Professor Edgard Santos Hospital, Federal University of Bahia, Salvador, BA, Brazil⁵Jorge Amado University Center, Salvador, BA, Brazil**Keywords**

- ▶ sleep fragmentation
- ▶ accidental falls
- ▶ elderly

Introduction: Falls in people over 65 years old rank third among the causes of accidental deaths both in United States and Brazil. Inadequate or insufficient sleep are frequent causes of falls and accidental injuries, and sleep fragmentation was showed to increase the risk of both, particularly in elderly.

Aim: To evaluate the association between sleep fragmentation and risk of falling in the elderly.

Methods: The PRISMA protocol was used as a guide for the systematic review. The descriptors were sleep fragmentation, accidental falls, and elderly. Inclusion criteria were cross-sectional studies; people aged 65 years or older, both sexes; studies that have evaluated sleep fragmentation and the occurrence of falls in the elderly. Exclusion criteria were studies involving animals; reviews; cards; abstracts; Congress proceedings.

Results: Out of 298 total studies, 09 articles were selected. The following results were observed: 1. Sleep fragmentation rates were associated with an increased risk of falls; 2. The average number of falls was 1.66 + 1.60, ranging from 1 to 14 falls. Falling while sleeping at night, walking during sleep, and waking up in the morning were variables related to the number of reported falls; 3. Men with 10% or more sleep time with arterial oxygen saturation < 90% were increased risk of having one to two falls compared with those who had < 1% of total sleep time with oxygen saturation < 90%. For those men with worse oxygen saturation during sleep, the total sleep time was shorter, and the sleep fragmentation was higher. Furthermore, sleep fragmentation was directly related to the decrease in oxygen saturation levels, which, in turn, are associated with the increased occurrence of falls; 4. Nocturia three or more times a night was associated with a 1.27 increase in the risk of an incident fall in the elderly.

Conclusions: Results from this study show an association between sleep fragmentation and a greater risk of falling in elderly, especially in women. Of relevance, nocturia and drop in oxyhemoglobin saturation < 90% (in men) were identified as additional contributors which should be better explored in future research.

ID: 1344

Excessive Daytime Sleepiness is Associated with Knee Pain in Older AdultsV. A. Kakazu¹, R. Z. Pinto², V. Dokkedal-Silva¹, G. L. Fernandes¹, C. Gobbi³, M. L. Andersen¹, S. Tufik¹, G. N. Pires¹, T. A. Dias⁴, P. K. Morelhão¹¹Universidade Federal de São Paulo, São Paulo, SP, Brazil²Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil³Universidade Cesumar, Maringá, PR, Brazil⁴Universidade Estadual Paulista Júlio de Mesquita Filho, Presidente Prudente, SP, Brazil**Keywords**

- ▶ sleep
- ▶ osteoarthritis
- ▶ pain
- ▶ elderly

Introduction: One in 3 older adults over 65 years old suffers from osteoarthritis (OA). Poor sleep prevails in ~35%

of people with OA, and it is related to pain exacerbation. Many studies have associated sleep quality with worsening pain, but the findings are inconsistent for Excessive Daytime Sleepiness (EDS) and knee OA specifically.

Aim: To examine the association between EDS and knee pain in older patients with OA.

Methods: Participants aged 60 years or older were included. They were interviewed about their sociodemographic and anthropometric data, knee OA symptoms and EDS. OA data were collected according to the criteria of the National Institute for Health and Care Excellence (NICE) guidelines, and EDS was assessed using the Epworth Sleepiness Scale. Participants answered the Mini Mental State Examination, those who were classified as cognitively impaired by this questionnaire were excluded as well as those who did not meet the NICE prerequisites for OA. A logistic regression was conducted to verify whether EDS is a risk factor for knee pain.

Results: The final sample contained 451 participants, 291 without knee pain and 160 with knee pain from OA. The mean age of the sample was 71.8 ± 7.89 years; 81.2% had EDS and 64.5% had OA. Participants with OA were 1.93 times more likely to have EDS (OR = 1.934, 95%CI (1.199 to 3.121); $p = 0.001$) when compared with individuals without pain.

Conclusions: EDS was associated with knee pain in older adults with OA. It is recommended that health professionals evaluate EDS as a risk factor for the worsening of OA pain.

ID: 1348

Dental Side Effects Evaluation in Users of the Intraoral Mandibular Advancement Appliance with Intraoral Scanner. A New Evaluation Method

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Keywords

- ▶ intraoral appliance
- ▶ intraoral scanner
- ▶ dental side effects

Introduction: Dental alterations are a possible side effects observed in long-term users of mandibular advancement intraoral appliances (IOAma). The monitoring and evaluation of dental stability are commonly performed with intraoral photos, plaster models of the dental arches and radiographs, which are periodically repeated and compared with the initial files visually and superimposing teleradiographs with a cephalometric study. As they are relatively accurate comparison methods, dental side effects can already be recognized by professionals with considerable magnitude, making the management and reversal of the condition complex, and may lead the user to abandon treatment.

Aim: To describe an accurate, practical and reproducible method of evaluating dental stability in IOAma users by comparing digital models of dental arches obtained by intraoral scanner.

Methods: 41 IOAma users had their dental arches scanned before use and after a period of 6 to 12 months of IOAma use. Using a software, the digital files obtained at

times T0 (initial) and T1 (6–12 months) were superimposed and compared regarding the stability of dental positioning in the arches, making it possible to quantify the coincidence or not of the files in millimeters. We selected 6 teeth per arch (central incisors, canines and first molars) and 3 different points along the long axis of the tooth in the incisors (incisal, middle and cervical) and 6 points in the canines and first molars (incisal/incisal(M), medium /medium(M) and occlusal/occlusal(M)). The following comparisons were made: a) upper arch only; b) lower arch only; c) upper and lower arches occluded in T0 x T1. The comparison of tooth movement was performed using paired *t*-test (data not normally distributed were transformed by the natural exponential function and the inverse of natural exponential function).

Results: Comparing upper and lower dental arches, the only tooth that did not undergo significant movement was 16. Tooth 41 ($p < 0.001$) showed significant movement in all marked points. Occluded arches analysis showed teeth 13, 23, 31, 41 and 43 with significant movement ($p < 0.001$) at all marked points.

Conclusions: The use of intraoral scanner proved to be an accurate and practical tool to aid the early dental side effects diagnosis in IOAma users.

ID: 1351

Improvement of the Quality of Life, Sleep and Behavioral Attitude through the Treatment of Malocclusion with Functional Jaws Orthopedic

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Keywords

- ▶ quality of life
- ▶ malocclusion
- ▶ breathing
- ▶ upper airway space

Introduction: Functional Jaws Orthopedic Treatment (FJOT) started in 2019, at 3 years old when the patient presented with difficult behavior, irritability, lack of lip sealing, ankyloglossia, impaired sleep, anterior crossbite, mandibular prognathism; with a diagnosis of 92% blockage of the upper airways and indication for adenoid surgery. Four months after the start of treatment, there was a change in the therapeutic posture between the maxilla and mandible; reversing of the anterior crossbite; lip sealing; restful sleep; lip frenulum surgery; considerable improvement in behavior; the upper airway space also expanded and then the Otorhinolaryngologist ruled out the need for adenoid surgery. Currently, patient is 6 years old, uses a functional orthopedic device to maintain the therapeutic change between the jaws to accompany her harmonic growth and craniofacial development.

Aim: The objective of this study is to present a clinical case of a child patient with compromised sleep quality and breathing, who after undergoing FJOT, showed improvement in the malocclusion, respiratory condition, improved behavior and sleep quality.

Methods: Three years follow up Functional Jaws Orthopedic Treatment with Bimler C Appliance, klamm Elastic Activator therapy and Simões Net Work 3, conjunction with upper lip and tongue frenulum surgery, besides periodic evaluation of the upper airway space with the Otorhinolaryngologist.

Results: The malocclusion was improved through the change in the therapeutic posture between the maxilla and mandible, reversing the anterior crossbite, lip sealing, improvement of the upper airway space, peaceful sleep, considerable improvement in behavior, and the Otorhinolaryngologist ruled out the need for adenoid surgery.

Conclusions: In conclusion, we recognize that Functional Jaws Orthopedic Treatment improved the quality of life of this patient, but at the same time, we recognize that FJOT is still foreign within Sleep Medicine and Sleep Dentistry and thus interdisciplinarity is required for the benefit of our patient's quality of life.

ID: 1353

Analysis of Tracking Instruments for Obstructive Sleep Apnea in Different Age Groups

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Keywords

- ▶ sleep apnea
- ▶ age
- ▶ questionnaires
- ▶ tracking instruments

Introduction: Obstructive sleep apnea syndrome (OSA) is the most frequent sleep respiratory disorder. Type I polysomnography (PSG) is the gold standard exam to diagnose, but it is difficult to access and has a high cost. Therefore, other tracking instruments are important tools for clinical practice.

Aim: To analyze Berlin (BQ) and STOP-BANG (SBQ) questionnaires performances, as well as the Epworth sleep scale (ESE), in different age groups.

Methods: This is a transversal study, with samples coming from the sleep clinic of the Hospital Universitário Gaffrée e Guinle, from February 2020 to January 2022. Subjects were interviewed with clinic epidemiologic data collection, including the three instruments and PSG. The sample were characterized into three age groups: 18 to 39 (G1), 40 to 59 (G2) and > 60 years (G3).

Results: The sample consisted of 321 subjects, whose 46% in the G2 and average age was 50 years. Females were the predominant gender (56%). OSA frequency was 79%, with 25% considered mild, 24% moderate and 39% severe. The severe OSA was predominant in G2 and G3, 43% and 42% respectively. When compared with PSG, BQ and SBQ showed better performance in all age groups. Concerning G1, G2 and G3, the PSG was positive for OAS, respectively in 67%, 86% and 79%, while in BQ it was 67%, 82% and 70%, and in SBQ, 59%, 86% and 82%; the ESE was positive in 65%, 52% and 31%. In the analysis of the general sample, BQ and SBQ had the highest sensibilities, 81% and 86%, respectively, while ESE had the highest specificity, 66%. The predictive positive value of the three instruments were very similar, due to their OSA frequency. The ESE showed the lowest negative predicted value, 27%. SBQ had the highest likelihood and accuracy ratios, 1.80 and 79%, respectively. The ESE had the worst accuracy, 56%. Age group analysis showed that the BQ had the best performance in G2, with an accuracy of 78%; SBQ had similar accuracy in all age groups. The ESE had similar performance in G1 and G2,

with lower sensibility and accuracy to G3, 37% and 48%, respectively.

Conclusions: In this sample, in a general way, BQ and SBQ showed better performances to OSA suspicion. In the age group analysis, SBQ stood out by showing similar performance for all groups, suggesting that it is a good instrument for application, regardless of age. BQ showed better performance to the intermediate range, while ESE was less satisfactory in the older subjects.

ID: 1354

Sleep Respiratory Disorders in Individuals with Treacher Collins Syndrome: Preliminary Results

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Keywords

- ▶ mandibulofacial dysostosis
- ▶ obstructive sleep apnea
- ▶ polysomnography and quality of life

Introduction: Treacher Collins Syndrome (CTS) is characterized by congenital craniofacial alterations including micro and mandibular retrognathia, auricular hypoplasia and the zygomatic arch, sometimes associated with cleft lip and palate. Because they are directly related to the airways, these atypical craniofacial features often lead to a reduction in nasal and pharyngeal dimensions, predisposing these individuals to obstructive sleep apnea (AOS).

Aim: Prospectively evaluate the occurrence of OSA in adult individuals with CTS, attended at the Physiology Laboratory of HRAC-USP.

Methods: All adult individuals (≥ 16 years) with CTS attended at HRAC-USP, during a period of 9 months, were invited to participate in the research, resulting in a n of 11 participants (21.4 ± 6 years). For the diagnosis of OSA, the volunteers were submitted to Type I Polysomnography (Embla N 7000). For the detection of possible signs and symptoms related to OSA, it was noted: a) risk for OSA (Berlin Questionnaire), b) excessive daytime sleepiness (Epworth Sleepiness Scale), c) occurrence of respiratory complaints (Laboratory respiratory symptoms questionnaire. Physiology HRAC-USP), d) anthropometric data: body mass index (BMI), systemic blood pressure (BP), cervical circumference (WC) and abdominal circumference (WC), e) quality of life (SF-36).

Results: An average AHI of 10 ± 21 (min = 0.2 and max = 77.5) was observed, with 27.27% presenting mild OSA and 10% severe OSA. In addition, 45% of the patients presented high risk for OSA (Berlin) and 30% excessive daytime sleepiness, high values for the age group studied. The main respiratory complaints were snoring (82% of cases), nasal obstruction (70%) and oral breathing (80%). The mean values of systolic BP corresponded to 110 ± 9 mm Hg and diastolic BP corresponded to 67 ± 9 mmHg. The mean BMI value corresponded to 23 ± 7 (low weight 36%, eutrophic 45%, obesity 19%, WC = 34 ± 5 cm (20% of them with WC above normality values), WC = 80 ± 17 cm (30% of them with WC above normality values).

Conclusions: Adults with CTS present physical characteristics that predispose them to OSA, with associated symptoms, due to the presence of craniofacial conditions

imposed by the anomaly, which justify frequent respiratory complaints in this population and with a relevant occurrence of OSA, even in early age.

ID: 1355

Sleep Quality in Upper Airway Resistance Syndrome Indicated by Cyclic Alternating Pattern Analysis

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Keywords

- ▶ upper airway resistance syndrome
- ▶ cyclic alternating pattern
- ▶ sleep instability

Introduction: Upper Airway Resistance Syndrome (UARS) is suspected in individuals with excessive daytime sleepiness, fatigue, and sleep fragmentation associated with increased respiratory effort. UARS can negatively impact daytime function. Conventional polysomnography parameters do not demonstrate significant abnormalities in UARS patients but increase in RERAs. Sleep abnormalities may not be indicated by AASM current manual definition in UARS patients. Cyclic alternating pattern (CAP) is a periodic electroencephalogram activity of non-REM sleep that expresses a condition of sleep instability.

Aim: The objective of the study was to compare CAP components between UARS patients and health individuals.

Methods: Fifteen subjects with UARS and 15 age- and sex- matched controls had their sleep study blinded analyzed. UARS criteria were the presence of sleepiness (Epworth Sleepiness Scale-ESS ≥ 10) and/or fatigue (Modified Fatigue Impact Scale ≥ 38) associated with an apnea/hypopnea index (AHI) ≤ 5 and a respiratory disturbance index (RDI) > 5 events/hour of sleep, and/or flow limitation in more than 30% of total sleep time. Control group criteria were AHI < 5 events/hour, RDI ≤ 5 events/hour and $< 30\%$ of TST with flow limitation and ESS < 10 , without sleep, clinical, neurological, or psychiatric disorder. CAP electroencephalogram of both groups was analyzed.

Results: The number of CAP cycles in NREM 1 stage was significantly higher in UARS patients compared with controls (3.0 ± 1.1 vs 0.5 ± 0.2 , respectively). Mean phase B duration in NREM 1 stage was significantly higher in UARS patients compared with control group (31.3 ± 8.1 vs 3.1 ± 1.4). Mean phase B duration in both NREM 2 and 3 were also significantly higher in UARS patients (28.3 ± 1.0 vs 25 ± 0.9 , $p = 0,02$ and 25.3 ± 1.1 vs 21.7 ± 1.0 , respectively). There was a significant positive correlation between number of CAP cycles in NREM 1 ($r = 0.6$) and mean phase B duration in NREM 1 ($r = 0.6$) and ESS. There was a significant positive correlation between number of CAP cycles in NREM 1 ($r = 0.4$), mean phase B duration in NREM 3 ($r = 0.4$) and mean phase B duration in NREM ($r = 0.4$) and Beck Depression Inventory score (BDI).

Conclusions: We found higher number of CAP cycles in NREM 1 and higher mean phase B duration in NREM 1, 2 and 3 stages in UARS compared with control, suggesting altered sleep regulation leading to sleep instability.

ID: 1356

Frequency of Risk Factors and Previous Diseases in Obstructive Sleep Apnea in Adults with Different Age Groups

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Keywords

- ▶ sleep apnea
- ▶ risk factors
- ▶ age group

Introduction: The obstructive sleep apnea (OSA) is the most frequent respiratory sleep-disordered, with a multifactorial pathophysiology and it is influenced by factors such as age, sex, and previous diseases. Knowledge of most frequently OSA's factors can help in its screening.

Aim: To analyze the frequency of risk factors, considering anthropometric measurements, and previous diseases in individuals with OSA, in different age groups.

Methods: This is a transversal study, with samples coming from the sleep clinic of the Hospital Universitário Gaffrée e Guinle, from February 2020 to January 2022. Subjects were interviewed with clinic epidemiologic data collection and a physical examination, which included verification of anthropometric measurements. All subjects underwent Type I polysomnography (PSG) for the diagnosis of OSA. The sample was characterized into three age groups: 18 to 39 (G1), 40 to 59 (G2) and > 60 years (G3).

Results: The sample consisted of 321 subjects, whose 46% in the G2, and average age was 50 years. Females were the predominant gender (56%). OSA frequency was 79%, with 25% considered mild, 24% moderate and 39% severe. The severe OSA was predominated in G2 and G3, 43% and 41%, respectively. Systemic arterial hypertension (SAH) prevailed among previous diseases, 45% in the general sample, with 13%, 50% and 67% in G1, G2 and G3, respectively. There was a low frequency of other classic OSA-related diseases, such as type 2 diabetes mellitus (18%) and ischemic heart disease (7.8%), both more frequent in G3, 34% and 13% respectively. A sedentary lifestyle stood out among the risk factors, with a frequency of 77%, being more frequent in G2 and G3, 78% and 80%, respectively. Nevertheless, in relation to risk factors, higher BMI and cervical circumference (CC) were observed in individuals with OSA in G1 and G2. In G3, lower values were found for calf circumference (CaC).

Conclusions: In the present sample, SAH, as a previous disease, and sedentary lifestyle stood out, corroborating themselves as classic risk factors in OSA. Anthropometric measurements were relevant in individuals with OSA, highlighting higher values of BMI and CC in the younger and intermediate subjects' group, as well as lower values of CaC in the group of older subjects. Therefore, the importance of anthropometric measurements is denoted as another factor to be considered in OSA suspicion.

ID: 1357**Obstructive Sleep Apnea Diagnosed According to Apnea/Hypopnea Index or Respiratory Disturbance Index Criterion: Does It Matter?**

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- ▶ sleep apnea
- ▶ apnea/hypopnea index
- ▶ fatigue
- ▶ depression

Introduction: Sleep disordered breathing (SDB) is defined based on clinical complaints and polysomnography events. Obstructive sleep apnea (OSA) was initially diagnosed based on the apnea hypopnea index (AHI), but the ICSD-3 has defined the respiratory disturbance index (RDI) as the actual diagnostic criteria.

Aim: This study aimed to evaluate and compare clinical outcomes related to daytime function in OSA patients defined by AHI and RDI.

Methods: This study was derived from the Sao Paulo Epidemiological Sleep Study (EPISONO), in its 3rd edition (2007) and follow up edition (2015). A total of 557 individuals had polysomnography evaluated according to the 2012 American Academy of Sleep Medicine Scoring Manual in both editions. The scores of the Epworth Sleepiness Scale (ESS), Chalder Fatigue Scale (CFS), Pittsburgh Sleep Quality Index (PSQI), Beck Anxiety and Depression Inventories (BAI and BDI) and Insomnia Severity Index (ISI) were compared between individuals who sustained the same AHI level in both editions (either $AHI < 15$ or $AHI \geq 15$). We did the same comparison between individuals who had either $RDI < 15$ or $RDI \geq 15$.

Results: The grouping by AHI included 348 participants with $AHI < 15$ and 107 with $AHI \geq 15$; while the grouping by RDI was composed by 335 with $RDI < 15$ and 118 with $RDI \geq 15$. Considering the AHI grouping, there was no statistically significant differences in ESS, PSQI, BDI and ISI scores after 8 years of follow up, but a significant increase in the CFS and BAI scores was observed. Considering the RDI grouping, there was no statistically significant difference on ESS, PSQI and ISI scores after 8 years of follow up, but there was a significant increase on CFS, BAI and BDI.

Conclusions: OSA diagnosed by either AHI or RDI was associated with increase in fatigue levels. However, when OSA was diagnosed according to RDI, a worse depression score was observed. Depression complaints can significantly impair quality of life and should be considered an important SDB outcome.

ID: 1358**Sleep Pattern of One Athlete and His Support Team in an Ultramarathon: A Case Report**

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- ▶ sleep
- ▶ sleep privation
- ▶ athletes

Introduction: Running has become increasingly popular, and the ultramarathon has drawn the attention of practitioners and researchers. One of the main challenges that ultramarathons offer to runners is sleep deprivation, which is one of the factors that can impair performance. Until today, there is little data in the literature about the ultramarathoner sleep, and no objective information about the sleep from their support team.

Aim: Evaluate the sleep pattern of one athlete and his support team during an ultramarathon.

Methods: The study was approved by the Ethics and Research Committee (4.799.521), and the evaluation was performed with an athlete and his support team (a driver and a pacer - who runs together to set the pace) in the "Brazil 135 Ultramarathon." The athlete ran 135 km and the three participants used an Ambulatory Monitoring Motionlogger Watch actigraph from the night before until the end of the competition. The equipment was collected at the end of the race and the data were downloaded using the Watch Ware software (Ambulatory Monitoring Inc.). Action W's Ambulatory Monitoring Inc. software was used to read the data. The race started between 05:00 and 06:00 AM and there was no manipulation in relation to the sleep routine of the evaluated.

Results: In the night before the race the athlete slept from 11:17 PM to 3:42 AM (239 minutes), with sleep having 89.85% efficiency, 23 minutes of latency and 27 minutes of Wake After Sleep Onset (WASO). During the ultramarathon, he interrupted the race to nap five times, with a total of 121 minutes. Four of these breaks were at night (after 00h) and at the finish line the athlete reported that sleep was the main limiting factor for his performance in the race. In the night before the race the driver slept from 10:54 PM to 3:52 AM (233 minutes), with 88.76% efficiency, 29 minutes of latency and 25 minutes of WASO. During the competition he napped 10 times, with a total time of 186 minutes. The pacer slept from 11:05 PM to 4:01 AM (271 minutes) in the night before the race, with 91.25% efficiency, 8 minutes of sleep latency and 26 minutes of WASO. During the race the pacer took a nap on 3 occasions (total of 48 minutes). The team's plan was not to sleep during the race, but they reported that the sleepiness was greater than expected.

Conclusions: The start time influenced the sleep of the night before the ultramarathon, and sleepiness during the race induced individuals to nap more than once during the race course.

ID: 1361**Nocturnal Awakening with Headache: A Population-based Longitudinal Study of the City of São Paulo, Brazil**

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- ▶ sleep
- ▶ nocturnal awakening
- ▶ headache

Introduction: The complaint of nocturnal awakening with headache (NAH) is a noteworthy issue, as it is prevalent in the general population and has been associated with several sleep and psychiatric conditions, being an indication for the occurrence of these disorders. We have previously identified that the complaint of NAH was prevalent (8.4%) and associated with sleep disorders, such

as insomnia, restless leg syndrome, nightmares, and bruxism in the EPISONO cohort.

Aim: To assess the incidence and evolution of NAH in a prospective 8-year follow-up study and to identify the factors associated with the persistence of this symptom.

Methods: Data from the EPISONO cohort was collected in 2007 and the follow-up study in 2015 - both conducted at the Instituto do Sono in the city of São Paulo, Brazil. Of the 1,042 volunteers enrolled at baseline, 715 agreed to participate in follow-up (68.6%). Questionnaires and scales were applied, and in-laboratory full polysomnography was performed both in 2007 and 2015. The complaint of NAH was identified using a questionnaire and classified as frequent, occasional, or absent. Frequent NAH was defined as having symptoms at least once a week, and occasional NAH as having symptoms one to three times a month.

Results: At follow-up, 110 participants reported NAH, but only 51 (51/715, 7.1%) had frequent complaints. Of these 110 participants, 82 (82/110, 74.5%) were the same as at baseline, but only 38 (38/110, 46.3%) persisted with frequent complaints. Compared with participants whose headaches became occasional, participants with frequent complaints had a statistically significant higher prevalence of insomnia symptoms; higher insomnia severity index (8.4 ± 5.1 vs 11.2 ± 6.4 , respectively); higher scores of anxiety (10.4 ± 9.3 vs 12.0 ± 10.0), and depression (10.6 ± 9.9 vs 12.0 ± 9.9) symptoms, as well as higher rates of fatigue (4.9 ± 3.1 vs 9.8 ± 5.6).

Conclusions: This study showed that frequent NAH was prevalent in the population of São Paulo both at baseline and 8 years late (follow-up), although it had reduced in 1.3%. Frequent NAH was associated with higher insomnia severity scores, higher anxiety and depression scores, and higher rates of fatigue.

ID: 1363

Impact of Sleep on Stuttering

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Keywords

- ▶ sleep
- ▶ stuttering
- ▶ evaluation study
- ▶ actigraphy

Introduction: The relationship between stuttering and sleep disorders seems to be bidirectional, since stutterers are compromised by negative self-perception, anxiety, and depression that can lead to sleep problems, on the other hand, sleep disorders can result in decreased motivation and concentration, memory deficit, daytime sleepiness, mood swings, a decline in immunity, and worsening of motor alterations that highlight the stuttering picture. This negative feedback between sleep disorders and the pathological picture, when identified, can be considered in therapeutic planning, and its treatment results in behavioral improvement.

Aim: The present study aims to investigate objective characteristics of the sleep-wake cycle in children with stuttering using actigraphy and their relationship with the degree of severity.

Methods: Twenty individuals of both genders, aged 9 to 11 years, participated in the study. One group consisted of 10 children with stuttering (CWS) and the comparative group

consisted of 10 children without stuttering (CWNS). All children were evaluated for the presence of sleep disorders, the Sleep Disorders Scale for Children - SDSC, and objective parameters of the sleep-wake cycle by actigraphy. The CWS group was also evaluated for speech fluency and stuttering severity.

Results: Regarding the indication of sleep disorders, 60% of the CWS group and 30% of the CWNS had a latency time to start to sleep longer than acceptable, and 40% of the CWS group had indications of sleep disorders, the most frequent being SDS found in 40%, DIMS in 20% and DTSV in 10% of the subjects. The CWS group had higher mean scores than the CWNS group in DTSV and Total Score. Analysis by actigraphy showed that the CWS showed higher mean scores than the CWNS in the Time to Bed. There was a correlation between total sleep time and the stuttering severity parameters: % disfluency typical of stuttering (% DTG) and total score, and between time in bed and % DTG.

Conclusions: The actigraphy data confirmed that the group of individuals with stuttering had a longer sleep latency time. The hypothesis that sleep parameters were related, possibly bidirectional, to parameters of stuttering severity was also confirmed.

ID: 1364

Sleep and Language in Smith-Magenis Syndrome: A Case Report

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Keywords

- ▶ sleep
- ▶ smith-magenis syndrome
- ▶ language
- ▶ actigraphy

Introduction: Smith-Magenis Syndrome (SMS) is described as a deletion of the 17p11.2 locus that results in craniofacial abnormalities, behavioral changes, autistic traits and cognitive impairments (moderate level intellectual disability and significant disturbance in language and learning development), and sleep disturbances. Severe sleep disorders have been reported in MSS; however, the characterization of such disorders, mainly by objective methods, and the possible relationships with other behavioral and cognitive parameters typical of the syndrome are still important for the therapeutic planning of this population.

Aim: To characterize sleep-wake cycle parameters of a patient diagnosed with SMS using the Pittsburgh Sleep Questionnaire (PSQI) and by actigraphy and relate them with language data.

Methods: The actigraph was placed on the non-dominant arm of the participant, a 20-year-old woman diagnosed with SMS, for 15 days. The language was assessed by the Peabody Test and the Token Test.

Results: PSQI data showed habitual sleep efficiency of 93.9%, increased sleep latency, decreased sleep duration, and indicative of the presence of sleep disturbance. The actigraphy showed that on average the time to sleep was 11:21 PM, time to get up was 5:43 AM, time in bed was 7.46 hours, total sleep time 6.44 hours, sleep latency 1.28 hours, sleep efficiency was 85.83% and time awake after sleep onset was ~1 hour. The language parameters were below expected for their age. The language sample was characterized by repetitive and

persistent verbal behavior, difficulties in the use of linguistic strategies to repair communication breakdowns, and limited vocabulary production with reduced grammatical components. The analysis of the narrative structure showed a poor performance in practically all the items taken into account.

Conclusions: The actigraphy data confirmed most of the sleep parameters reported in the Pittsburgh questionnaire except for sleep efficiency, which was worse when recorded by actigraphy than in the subjective evaluation. These data indicate that the therapeutic planning of language disorders should consider the previous or combined treatment of sleep disorders considering the relationship between sleep disorders and language parameters already demonstrated in other studies.

ID: 1366

Insomnia and Personality Traits

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Keywords

- ▶ insomnia
- ▶ neuroticism
- ▶ personality traits

Introduction: Personality traits can be considered predisposing and potential perpetuating factors of chronic insomnia. Studies based on the five-factor model of personality show that insomniacs demonstrate higher levels of neuroticism and lower levels of conscientiousness, however the existing literature on the matter is still inconclusive about which personality traits show a higher level of correlation with chronic insomnia. Identifying and analyzing the most pervasive attributes in insomniacs may help in choosing and planning the most adequate treatment to each individual patient.

Aim: Identifying personality traits associated with the presence of chronic insomnia.

Methods: Participated 609 adults, ages 18–59 years ($M = 38.7$, $SD = 10.6$), 81.1% women and 18.9% without a college degree, divided into two groups: with insomnia ($n = 371$, 78.2% women, $M = 40.1$; $SD = 11.3$) and without insomnia ($n = 238$, 85.7% women, $M = 36.6$ years; $SD = 9$). Insomniacs met DSM-V diagnostic criteria for chronic insomnia and controls are healthy adults with no complaints of insomnia. Individuals with other sleep disorders were excluded. All participants completed the online version of NEO Five-Factor Inventory Revised (NEO-FFI-R) with the assistance of a psychologist. A multivariate analysis was conducted using a binary logistic regression model to assess the personality factors associated with insomnia classification. The multivariate model included age, sex, academic background (college degree/no college degree) and the big five personality traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness) as predictors of insomnia classification (insomnia/no insomnia).

Results: The model was statistically significant [$\chi^2(8) = 168$, $p < 0.001$] and explained ~21% of the variance (McFadden's R^2). We found that, holding all other constant predictor variables, the odds for insomnia classification increased by: 104% for males; 245% for people without a university degree; 7% for each additional year of age; 8% for each additional point on the Neuroticism scale; and 3% for each reduced point on the Openness scale. Data should be

interpreted with caution due to the small number of male participants and of those who do not have a higher education.

Conclusions: The results corroborate previous studies showing that high scores in neuroticism and lower scores in openness are associated with the presence of insomnia.

ID: 1368

Sleep-onset Time Variability and Sleep Characteristics on Weekday and Weekend Nights in Patients with COPD

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Keywords

- ▶ pulmonary disease
- ▶ chronic obstructive
- ▶ sleep
- ▶ actigraphy

Introduction: Although it is primarily a respiratory disease, chronic obstructive pulmonary disease (COPD) has many extra pulmonary features, including sleep disturbances. Sleep irregularity, one of the main sleep disturbances, can be measured by sleep-onset time variability (i.e., intrasubject standard deviation of sleep-onset time). Despite having been investigated in many diseases, variability of sleep-onset time was not yet thoroughly investigated in individuals with COPD.

Aim: To analyze the repercussion of sleep-onset time variability on the quantity and quality of sleep in individuals with moderate-to-severe COPD and to describe sleep characteristics on weekday and weekend nights in this population.

Methods: Pulmonary function was assessed using a portable spirometer and exercise capacity was assessed by the 6-minute walk test. Sleep was objectively assessed by a sleep monitor for seven consecutive nights. For analysis, individuals were divided into two groups according to results of sleep-onset time variability, characterized by intrasubject standard deviation of sleep-onset time (SOTV) ≥ 60 minute or < 60 minute.

Results: The sample comprised 55 individuals (28 males; mean age 66 ± 8 years; median FEV1 55 [38–62]% predicted). When compared with the SOTV < 60 min group ($n = 24$), the SOTV ≥ 60 min group ($n = 31$) presented shorter total sleep time (5.1 ± 1.3 h versus 6.0 ± 1.3 h; $p = 0.006$), lower sleep efficiency ($73 \pm 12\%$ versus $65 \pm 13\%$; $p = 0.030$), longer wake time after sleep onset (155 ± 66 minute versus 115 ± 52 minute; $p = 0.023$), longer duration of wake bouts (19 [16–28] min versus 16 [13–22] min; $p = 0.025$), and higher number of steps at night (143 [104–213] versus 80 [59–135]; $p = 0.002$). In general, sleep characteristics were poor regardless of the day of the week, and the only significant difference being that the participants woke up ~30 minute later on weekends than on weekdays ($p = 0.013$).

Conclusions: Sleep-onset time varied over 1h in a standard week in the majority of individuals with COPD in this sample, and a more irregular sleep onset indicated poor sleep quality both on weekdays and weekends. Sleep hygiene orientation could benefit these individuals if integrated with their health care.

ID: 1369

Do Airline Pilots Get Enough Sleep Before Night and Early Shifts?

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Keywords

- ▶ airline pilots
- ▶ sleep duration
- ▶ night shift
- ▶ early shift

Introduction: Most people would find a challenge working at nighttime. Workers are not supposed to sleep during the night working hours but should be alert during the whole shift. Similarly, early morning shifts demand the workers to phase advance their bed and waking times to have adequate rest before starting work. Anticipating sleep time may be difficult due to biological and social reasons.

Aim: We evaluated the mean total sleep duration (MTSD) around the clock and particularly before night and early morning shifts among airline pilots operating domestic flights in Brazil.

Methods: Study participants were 51 commercial pilots from Brazilian airlines (44 males, mean age 40 years). Their sleep and waking times were registered during 15 consecutive days. They wore actigraphs (Condor Instruments ActTrust 2) in the non-dominant wrist and filled out sleep logs during the data collection (Dec 21 - May 22). Their work schedules followed irregular work patterns according to ANAC's regulation. Night shifts were considered all flight duties starting from 00h00 to 06h00, and early-morning, 06h01 to 07h59. As further analysis was performed, the night shift was divided into three categories of two hours each (00h00 to 02h00; 02h01 to 04h00; 04h01 to 06h00).

Results: 493 flight duties were registered, among those 139 started during night and 72 during early-morning. MTSD before night and early-morning shifts was 389 minute (sd 102), while MTSD before all other flight duties during daytime and evening hours was 463 minute (sd 104). These MTSD are significantly different ($p < 0.001$). Comparing night to early morning, MTSD were 368 minute (sd 100) before night shifts and 429 minute (sd 94) before early mornings ($p < 0.001$). Results also showed MTSD increased as the starting working times delayed during night and early morning: 298, 332, 386, 429 minute, respectively. MTSD comparing 00h00 to 02h00 and 02h01 to 04:00 were not significantly different ($p = 0.44$). Starting flights between 00h00 and 04h00 showed the lowest MTSD (319 minute).

Conclusions: Starting work between 00h00 to 07h59 shortened MTSD ~75 minutes compared with joined day and evening hours. Considering NSF recommendation of sleep duration for 26–64 years, airline pilots do not get enough sleep before night and early flight duties. The reason is probably work schedule related.

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ID: 1370

Diagnostic Ability of Insomnia through Metabolomic Analysis: A Systematic Review and Meta-analysis

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Keywords

- ▶ adult
- ▶ sleep initiation and maintenance disorders
- ▶ metabolomics

Introduction: Metabolomics has wide clinical applicability, constituting a powerful tool for evaluating metabolic variations in individuals with insomnia.

Aim: To evaluate the diagnostic ability of metabolomic analysis to detect insomnia in adults.

Methods: Articles were searched for using the MEDLINE/PubMed, Cochrane, and VHL electronic databases by combining the Medical Subject Headings (MeSH) descriptors, including publications in English: Metabolomic, insomnia, adults. Inclusion criteria: articles that included metabolomic analysis, patients aged 18 years or older, diagnosed with insomnia by the Insomnia Severity Index (ISI), sleep diary, or the American Academy of Sleep Medicine criteria. Exclusion criteria: comorbidities, pregnant or breastfeeding women in the last 6 months, abstracts, conference proceedings, meetings and symposia, and crossover studies. PROSPERO registration number: CRD42021221679.

Results: A total of 791 studies were evaluated. Of these, 5 were included in the systematic review. Samples ranged from 30 to 40 subjects (total $n = 167$). One study identified 20 elevated and 14 reduced metabolites in patients with insomnia. The data obtained for glutamate/glutamine (Glx) levels were increased in insomniacs, while phosphocreatine (PCr) in the gray matter and phosphocholine in the white matter were reduced in this group. In addition, the GABA values were interesting since one study found it to be 30% reduced in insomniacs compared with the control group. Meanwhile, another study found this metabolite to be 12% higher in the occipital region in insomniacs.

Conclusions: Through the present study, it was possible to observe that many metabolites were able to characterize individuals with insomnia, especially the reduction of GABA at the brain level, phosphocreatine in the gray matter, and phosphocholine in the white matter. Despite the potential of some metabolic markers in predicting insomnia in adults, further studies will be necessary, with the definition

of targeted algorithms and allowing the discussion of an eventual consensus for their practical application.

ID: 1371

Influence of the School Shift on Subjective Sleep Quality and Related Parameters and Subjective Well-being in College Students

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Keywords

- ▶ sleep
- ▶ college students
- ▶ well-being
- ▶ biological rhythms

Introduction: College students are routinely exposed to exacerbated stress, which harms their mental and physical health and may impact on their academic life. The high demands and obligations, the lifestyle conditions to which students are exposed to can contribute to poor sleep quality by inducing excessive daytime sleepiness and increased sleep latency. The literature describes that interventions by delaying the school start time improves students' sleep quality with increment of the total sleep time and reduction of daytime sleepiness.

Aim: Evaluate the influence of the study shift (morning, evening, night or full-time) in sleep quality and related parameters and on subjective well-being.

Methods: We analyze data of 615 students from public (Universidade Federal de São Paulo) and private (Centro Universitário São Camilo) colleges in São Paulo city. Data were collected between September/2018 and June/2021 with an electronic form, containing sociodemographic questions and questionnaires to assess subjective sleep quality (Pittsburgh Sleep Quality Index), circadian preferences (Morning-Eveningness Questionnaire), daytime sleepiness (Epworth Sleepiness Scale) and subjective well-being (World Health Organization 5-item Well-being Index). Gender (82% women), age (23 ± 7 years) and circadian preferences were used as covariates in the statistical analysis.

Results: No significant effects related to school shift were found for any of the sleep parameters and subjective well-being evaluated. Women had poor sleep quality and more daytime sleepiness when compared with men. Early preferences were associated with better sleep quality, greater subjective well-being and less daytime sleepiness.

Conclusions: We did not observe any effect of the school shift on the subjective sleep quality and related parameters and on subjective well-being. However, our results demonstrated that women and evening-types may be more vulnerable to harmful changes in these parameters. This study can serve as a basis for future studies in the understanding of how these relationships occur and, possibly, in the development of interventions that aim to promote well-being, reception and support for these students.

ID: 1372

Central Hypersomnia and Chronic Insomnia: Expanding the Spectrum of Sleep Disorders in Long COVID Syndrome - A Prospective Cohort Study

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Keywords

- ▶ long-COVID
- ▶ narcolepsy
- ▶ insomnia

Introduction: Long-onset COVID syndrome has been described in patients with COVID-19 infection with persistence of symptoms or development of sequelae beyond 4 weeks after the onset of acute symptoms, a medium- and long-term consequence of COVID-19. This syndrome can affect up to 32% of affected individuals.

Aim: The present study aimed to characterize and evaluate the prevalence of sleep symptoms in patients with long COVID syndrome.

Methods: A total of 207 patients with post-COVID symptoms were evaluated through clinical evaluation with a neurologist, cognitive and sleep test and specific exams in the subgroup complaining of excessive sleepiness (ES). **Results:** Among 189 patients included in the long COVID sample, 48 (25.3%) had sleep-related symptoms. Insomnia was reported by 42 patients (22.2%), and excessive sleepiness was reported by 6 patients (3.17%). Four patients with ES were evaluated with polysomnography and test, multiple sleep latencies test, and Actigraphic data. Of a total of 4 patients with ES, 3 fulfilled the clinical criteria for central hypersomnia, and one reported symptoms of ES that resolved spontaneously after 6 months without intervention. We observed a high prevalence of cognitive complaints in these patients.

Results: This study demonstrated a high prevalence of sleep symptoms in a cohort of long-term COVID-19 patients with persistent sleep disorders up to 18 months after infection. Insomnia was the most frequent sleep disorder in these patients. To the best of our knowledge, we have reported the first cases of central hypersomnia after COVID. One of our patients fulfilled clinical and polysomnographic criteria for narcolepsy. All patients with ES responded to wakefulness-promoting agents. We have reported three patients with documented central hypersomnia after COVID-19. All 3 patients were young and had no sleep disorders prior to COVID infection, suggesting a strong association with SARS-CoV-2 infection. To our knowledge, this is the first report of this association in the literature. In addition to the possibility of direct viral infection, hypersomnia after COVID might be related to immune and inflammatory hyperactivation resulting in hypothalamic infiltration by CD4+ and CD8+ T cells leading to neuronal damage.

Conclusions: Sleep disorders are common in patients with long COVID syndrome, particularly insomnia. Chronic insomnia and central hypersomnia may expand the spectrum of post-COVID sleep disturbances.

ID: 1373

Sleep Pattern, Excessive Daytime Sleepiness and Obesity in a Population Sample from a Rural Community in Northeastern Brazil

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Keywords

- ▶ circadian rhythms
- ▶ obesity
- ▶ rural health

Introduction: The sleep expressed in a population can predict health conditions. Urbanization promotes sleep irregularity and is related to the increasing worldwide rates of sleepiness and obesity, although little is known in rural populations.

Aim: To evaluate sleep patterns, rates of excessive daytime sleepiness (EDS) and overweight in a small rural town in Brazil.

Methods: This was a cross-sectional, descriptive, quantitative study performed with a population composed of individuals living exclusively in the rural zone of the Community Palma, localized in Caicó-RN. The study was approved by the Research Ethics Committee. Participants were submitted to sociodemographic and Munich questionnaires (with additional questions to assess naps), Epworth Sleepiness Scale and Body Mass Index (BMI) assessment. IBM SPSS software was used for statistical analysis, with a confidence interval of 95% and $p < 0.05$.

Results: This study had 306 participants, 40% were older than 51 years, 66% were female, 65.5% had less than elementary school education, 76.8% had a partner, 91% had a monthly income of less than 3 minimum salaries, and 63.5% were not directly involved in rural activities. 58.4% reported a sedentary lifestyle, 59.4% had three meals a day, 88.1% were non-smokers, and 72.6% were non-drinkers. Sleep pattern (bedtime 21h00; wake-up time 05h00; sleep duration of ~8h/night) did not vary between weekdays and weekend. From the Munich Questionnaire, the median midpoint of sleep (MSFc or MSF) was 01h00 ($\pm 1h15min$) and the chronotype was defined from tertiles, with a predominance of morning (34.4%) and intermediate (36.6%). 73.8% reported naps with a mean duration of 1h/day. Multivariate analysis revealed that the chronotype had a significant association with age ($p = 0.001$), gender ($p = 0.001$), marital status ($p = 0.001$), and obesity ($p = 0.032$). 20% had EDS, with association with marital status ($p = 0.018$). Based on BMI, 66.4% showed overweight, associating with age ($p = 0.002$), marital status accompanied ($p = 0.003$) and at least one obese parent ($p = 0.001$).

Conclusions: In the study population, it was found that sleep episode allocation attends to environmental and socio-cultural factors in rural contexts. The low variability in sleep patterns and duration of sleep per night, associated with the habit of napping, suggest a satisfactory sleep duration, associated with a low prevalence of EDS. Despite this, obesity was prevalent in this sample, highlighting other causal factors.

ID: 1375

The Effect of Constraint-Induced Movement Therapy on the Rest-activity Patterns in Children with Spastic Hemiparetic Cerebral Palsy

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Keywords

- ▶ cerebral palsy
- ▶ rest activity- patterns
- ▶ actimetry
- ▶ constraint- induced movement therapy
- ▶ children

Introduction: Spastic hemiparetic Cerebral Palsy (CP) is the most prevalent type of CP; it is a condition that affects muscle control and function on one side of the body. Children with spastic hemiparesis experience difficulties when using their affected upper extremities in their daily lives, and one effective treatment is Constraint-Induced Movement Therapy (CIMT). The study of rest-activity patterns provides information on children's daily activities with spastic hemiparetic CP during the day and sleep.

Aim: We aim to investigate the effect of CIMT on the rest-activity patterns in children with spastic hemiparetic CP vs in a healthy group.

Methods: This nonrandomized controlled trial was conducted at the neuropediatric center. Children with spastic hemiparetic CP between 5 and 16 years participated in the study group. The healthy group was composed of children between 5 and 15 years. Changes in rest-activity patterns can be studied through nonparametric variables of actigraphy: M10 (an individual's most active 10h); L5 (an individual's least active 5h); and RA (relative amplitude of the rest-activity patterns).

Results: Forty-five children were recruited; 38 were included in the analyses; 19 had spastic hemiparetic CP (study group), their mean age was 9.31 years (± 3.07), and 11 (57.8%) were boys; 19 children were from the healthy group, their mean age was 9.84 years (± 2.69), and 13 (68.4%) were girls. In the study group, there was a significant increase in M10 and L5 ($p < 0.001$), and in the frequency and quality of movement of the affected upper extremity ($p < 0.001$) after CIMT. The values of M10 and L5 were significantly higher ($p < 0.001$) in the healthy group compared with the study group after CIMT. No differences were found between RA in the study group and the healthy group after CIMT ($p = 0.157$).

Conclusions: Our results demonstrated that CIMT increased the values of the M10 and L5 variables, which shows an improvement in rest-activity patterns. In summary, these non-parametric actimetry variables successfully showed that children with spastic hemiparetic CP became more active and participant in their daily life during the day as well as more efficient sleeping.

ID: 1376

Presence of Fragmented and Poor-Quality Sleep in Patients with Snoring and Nasal ObstructionA. C. Ribeiro¹, A. Gelsinski¹, D. P. Rodrigues¹, N. C. D. S. Argollo², B. C. Martins¹, L. R. Ferreira³, G. M. R. Rezende¹, L. P. Monteiro¹¹Universidade Católica de Brasília, Brasília, DF, Brazil²Nubia Santana Otorrino e Medicina do Sono, Brasília, DF, Brazil³Escola Superior de Ciências da Saúde, Brasília, DF, Brazil**Keywords**

- ▶ fragmented sleep
- ▶ snoring
- ▶ nasal obstruction and sleep apnea

Introduction: The obstructive sleep apnea (OSA) is a sleep disorder characterized by the complete or partial recurrent breath blockage that affects directly the sleep quality. Among the consequences of OSA are the non-renovated and fragmented sleep.

Aim: Evaluate which impact snoring and nasal obstruction (NO) have in the quality and fragmentation of sleep, through parameters obtained in polysomnography.

Methods: 245 patients that went through polysomnography were evaluated saying they NO between 2018 and 2020. In addition to polysomnography and the Epworth Sleepiness Scale, the patients answered a pre-sleepiness questionnaire which had data about sleep, sex, age, symptoms during the day and diseases.

Results: We analyzed the questionnaires obtained from the 245 patients with NO and divided them into two groups: A – patients who had snoring and B – patients who did not have snoring. Following that, we analyzed the polysomnography from group A and B, and took notes of the parameters that indicated quality of sleep: sleep efficiency (SE) and micro wakings (MW). Patients with index of $MW \geq 10$ and or patients with $SE \leq 85\%$ were considered having bad sleep quality. So, 219 patients were from group A and 26 were from group B. When we analyzed the sleep patterns from group A, we observed that 177 patients (80.82%) had bad sleep quality and in group B 21 patients (80.76%) showed a bad quality of sleep. As we juxtaposed group A and B per group age, the more prevalent: A – 77.63% between 20 and 60 years old; B – 65.38% between 20 and 60 years old; Sorting by sex groups: A – 60.73% men and 39.27% women and B – 61.53% men and 38.47% women. And finally, the results with the Body Mass Index (BMI) the most prevalent were: A - Overweight ≥ 25 a ≤ 29.99 Kg/m² (43.38%); and B – normal $\geq 18,5$ and ≤ 24.99 kg/m² (42.30%).

Conclusions: We concluded that despite the majority of patients with snoring and NO having presented bad quality sleep, the snoring does not appear to be the major factor influencing in the quality of the sleep, for the patients who have NO and do not snore also have a predominancy in bad sleep quality. So, it is likely that the fact of having only NO not related to snoring, be in itself a factor that augments the chance of having bad quality sleep. Besides this, it was possible to observe this characteristic prevailing more in patients with bad quality sleep: men, within the age group between 20 and 59 years old and BMI ≥ 25 kg/m².

ID: 1377

Clinical Improvement of REM Sleep Behavior Disorder after the Combination of Amantadine and Quetiapine

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Keywords

- ▶ REM sleep behavior disorder
- ▶ Lewy body disease
- ▶ amantadine

Introduction: Rapid eye movement (REM) sleep behavior disorder (RBD) is a parasomnia characterized by motor activity during sleep resulting from loss of REM sleep atonia. It is often associated with synucleinopathies such as dementia with Lewy bodies (DLB).

Aim: We report a case of a patient with RBD who did not respond to standard treatment and whose condition was completely under control after the combination of amantadine and quetiapine.

Methods: Clinical data were collected from electronic medical records.

Results: A 45-year-old woman was referred to the neurology department reporting frequent nocturnal episodes of restlessness with walking and vocalizations. Upon awakening, she had incomplete recollection of the episodes, and the description of the events were reported to the patient by her mother, with whom she lives. She reported worsening frequency and intensity of the condition after a recent COVID-19 infection, with daily events. She reported previous treatment with no improvement. She described similar episodes in childhood, with complete improvement in adolescence. On physical examination, she showed mild impairment of upper limb balance; other subjects on neurologic examination without changes. Clonazepam 2.5 mg/ml 4 drops was started, and the dosage was increased by 1 drop every 2 days up to 10 drops/day. Transcranial ultrasound of the brain parenchyma, magnetic resonance imaging of the brain, and polysomnography were also requested. Thereafter, the patient reported a worsening of her condition and began to remember her nightmares. The medication was discontinued and quetiapine 25 mg/day was started. Ultrasound measurement of the substantia nigra showed 10 mm² on the right and 15 mm² on the left (reference value 25 mm²). Magnetic resonance imaging showed absence of the swallow tail sign. Polysomnography showed no changes, but there was a loss in technical quality because the multiple sleep latency tests were not performed. Then, therapy with amantadine 50 mg/day in combination with quetiapine 25 mg/day was started. She reported significant clinical improvement with a reduction in the frequency of episodes. After a new dose adjustment with amantadine 100 mg/day and quetiapine 25 mg/day, the patient developed stably without new episodes.

Conclusions: Movement disorder may be suspected in patients with spontaneous RBD who do not respond to clonazepam, and amantadine might be a possible therapeutic option.

ID: 1378

The Incidence of Snoring in Patients with Nasal Obstruction and Its Correlation to Sleep Apnea Severity

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Keywords

- ▶ nasal obstruction
- ▶ SOAHS
- ▶ snoring

Introduction: Due to changes in the structure and the coating of the nose, nasal obstruction (NO) increases upper airway resistance, contributing to the development of snoring and Sleep Obstructive Apnea and Hypopnea Syndrome (SOAHS). Therefore, the amount of patients who suffer from snoring has been searched out in a sample group that accuses the presence of NO, as well as the incidence of SOAHS and its levels of intensity.

Aim: To evaluate the incidence of snoring in patients with NO and the impact of those variables in the gravity of SOAHS. To observe the distribution of such parameters according to sex, age and Body Mass Index (BMI).

Methods: A sample of 255 patients from 2018 to 2020 was evaluated. Of such, 220 patients presented NO and snoring. The patients were submitted to a pre-sleep survey, to Epworth's Sleepiness Scale and to a polysomnography. The goal of this research was to understand the impact of snoring and NO in the presence and gravity of SOAHS, in addition to dividing them according to sex, age, BMI and severity of apnea.

Results: 220 of the studied patients (86.27%) fulfilled the criteria of NO and snoring. According to the sex division, 135 people were men (61.36%) and 85 were women (38.64%). When it comes to age, patients were divided into 3 groups: less than 20 years of age (3.18%), between 21 and 59 years of age (75.91%) and above 60 years of age (20.91%). Regarding the BMI, parameters used were: normal, with BMI below 24.9 Kg/m² (26.48%); overweight, with BMI between 25 and 29.9 Kg/m² (43.38%) and obese, with BMI above 30 Kg/m² (30.14%). Apnea-hypopnea index (AHI) was calculated by the number of obstructive apnea and hypopnea episodes per hour of sleep. The SOA gravity classification was: normal when AHI < 5 (17.27%); mild when AHI between 5 and 15 (30.45%); moderate when AHI between 15 and 30 (23.64%) and severe when AHI > 30 episodes per hour of sleep (28.64%).

Conclusions: In summary, 86.27% of patients with NO snore. BMI has shown to be an important risk factor, considering 73.52% of patients who snore have a BMI above 25 Kg/m². Furthermore, an increased prevalence in male adults (between 21 and 69 years) was observed. 82.73% of snorers present SOAHS. They are divided practically evenly regarding the gravity of AHI, although the mild classification was slightly predominant. Therefore, it has been found that the association of NO and snoring is related to SOAHS but doesn't influence the gravity of the illness.

ID: 1379

Pro-atherogenic Factors and Sleep Quality among Women with Severe Obesity

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Keywords

- ▶ PAI-1
- ▶ poor sleep quality
- ▶ cardiovascular diseases

Introduction: Cardiovascular diseases are the first cause of death in Brazil and as a multifactorial disease, many factors should be analyzed. Poor quality sleep is associated with coronary heart disease (CHD), inflammation and pro-coagulant factors. Plasminogen Activator Inhibitor-1 (PAI-1) can be a link between sleep characteristics and CHD, both factors elevated in severe obesity. Higher PAI-1 levels are related to higher sleep disorders by polysomnography, but more studies should analyze it with more applicable measurements.

Aim: The main of the study is to test the hypothesis that seric concentrations of PAI-1 in severe obese women is associated with impaired sleep evaluated by validated questionnaires.

Methods: Forty-five women with severe obesity (BMI > 40 kg/m²) at a public hospital were enrolled in this study, approved by Ethics Committee (961/19). The quality of sleep was analyzed by Pittsburgh Sleep Quality Index (PSQI) and Epworth sleepiness scale (ESS). Anthropometric measurements collected were: weight, height, neck (NC), waist (WC), and hip circumference (HC). Blood samples were collected to analyze the metabolic profile (glucose/lipid profile; c-reactive protein) and PAI-1 (determined by ELISA immunoassay). Statistical analyses were performed in SPSS. Normality was assessed by Shapiro Wilk Test. Generalized Linear Models (GLZM) was used to compare the groups and Spearman's to verify the correlation between sleep disorders and other variables. The volunteers were grouped according the median of values of PAI-1.

Results: The mean age and BMI of the volunteers were 40.1 ± 8,5 years and 48.19 ± 7.05 kg/m², respectively. All the mean values of circumferences were compatible with cardiovascular risk. The prevalence of impaired sleep was 68.9% and 42.2% assessing PSQI and ESS. No correlation in sleep questionnaires and metabolic parameters were found. The group with high values of PAI-1 presented significant higher insulin and lower HDL, but any difference in sleep analyses was observed. In correlation analyses, the group with high levels of PAI-1 showed a correlation between PSQI and total cholesterol ($r = 0.503$; $p = 0.033$) and the group with low levels of PAI-1 showed a negative correlation between ESS and HDL ($r = -0,481$; $p = 0.023$).

Conclusions: Both sleep parameters were correlated with pro-atherosclerotic lipid profile in patients with severe obesity. No difference between sleep quality was observed when analyzed by PAI-1 levels. Funding: CNPq/FUNAPE.

ID: 1380

Effect of Continuous Positive Airway Pressure on Telomere Length and Its Associated Mechanisms

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Keywords

- ▶ sleep apnea
- ▶ sleep
- ▶ cpap
- ▶ telomeres

Introduction: Growing cross-sectional evidence suggests the contribution of obstructive sleep apnea (OSA) in the molecular pathways of aging related to the maintenance of telomere length, through the accumulation of damage by greater levels of inflammation and reactive oxygen species. However, to date, only a couple of studies investigated the role of OSA or its treatment on telomere in a longitudinal approach.

Aim: In this sense, the present study aimed to investigate the effect of OSA and its treatment with continuous positive airway pressure (CPAP) on the variation of telomere length and its associated mechanisms.

Methods: A 6-month randomized, double-blind and sham-controlled clinical trial was conducted. Participants were randomized to use CPAP or sham-CPAP and attended 7 visits, in which they underwent clinical assessment and had their blood collected to determine mean leukocyte telomere length (LTL) and the dosage of metabolic and inflammatory markers.

Results: Among 127 individuals that we contacted, 46 met the inclusion criteria. At baseline, individuals in both groups were homogeneous. After 3 months of treatment, we observed an effect of the treatment on LTL, in which the SHAM group (1.0117 ± 0.1552 vs 0.9457 ± 0.0747) showed a more expressive reduction than the CPAP group (1.0960 ± 0.1122 vs 1.0521 ± 0.1094). After 6 months of treatment, we observed a reduction of depressive and anxiety symptoms and sleepiness, as well as an improvement in sleep quality. We found a time-related stability on LTL in individuals undergoing CPAP treatment (1.0960 ± 0.1122 , 1.0521 ± 0.1094 , 1.0675 ± 0.1225). We also analyzed the correlation between deltas LTL with TNF- α and IL-6. We observed a significant correlation between LTL and TNF- α ($\rho = -0.354$, $p < 0.001$). Interestingly, when we stratified by intervention, we no longer observed the correlation in CPAP group ($\rho = -0.150$, $p = 0.195$), but a stronger negative correlation between SHAM and TNF- α ($\rho = -0.475$, $p = 0.08$).

Conclusions: We could conclude that CPAP, when compared with the sham-CPAP, was effective in normalizing the polysomnographic parameters and the subjective complaints normally reported by individuals with OSA. Regarding the main outcome of the study, we observed an effect of the treatment on the stability of the LTL. This work was supported by grants from Associação Fundo de Incentivo à Pesquisa (AFIP) and Fundação de Amparo à Pesquisa de São Paulo (FAPESP).

ID: 1382

Development of the Sleep Acceptance Scale (SAS)

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Keywords

- ▶ acceptance
- ▶ insomnia
- ▶ scale construction

Introduction: Insomnia symptoms are associated with higher levels of metacognitive control. Controlled information processing interferes with a healthy sleep process by preventing cognitive deactivation, which involves diminished verbal regulation and control, and acceptance of spontaneous processes. Because general tools for measuring acceptance do not address sleep-related behaviors, the development of specific instruments is essential for studying the acceptance of sleep.

Aim: This study aimed to develop a new measure of sleep acceptance, titled Sleep Acceptance Scale (SAS), and examine its factorial structure, internal consistency, and construct validity.

Methods: The SAS was developed as a 6-item self-report questionnaire rated using a scale ranging from 1 (never) to 7 (always), such that higher scores indicate lower sleep acceptance. Data were collected from online surveys responded by 1419 participants, with and without insomnia symptoms. Participants also completed: The Hospital Anxiety and Depression Scale (HADS), Insomnia Severity Index (ISI), Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16), Acceptance and Action Questionnaire (AAQ-II), and Sleep Problem Acceptance Questionnaire (SPAQ). We conducted a parallel analysis and exploratory factor analysis to estimate the number of facets underlying the instrument items. Then, we ran a confirmatory factor analysis to obtain fit statistics and parameter estimates. Reliability indices for each of the facets were obtained using Cronbach's α and McDonald's ω . We assessed construct validity by examining the relations with variables known to be linked with insomnia.

Results: Mean age was 38.6 ± 9.8 years. Our sample included 1141 women and 1084 participants with insomnia symptoms. The parallel analysis procedure indicated two latent factors: avoidance (two items) and distress (four items). The 2-factor model showed a good fit [$\chi^2(8) = 59.48$, $RMSEA = 0.067$ [0.05, 0.084]; $CFI = 0.999$; $RNI = 0.999$; $TLI = 0.998$] and factor loadings ranging from 0.55 to 0.95. Internal consistency was suboptimal for avoidance ($\alpha = 0.53$ [0.48, 0.58], $\omega = 0.55$ [0.52, 0.6]) and excellent for distress ($\alpha = 0.93$ [0.93, 0.94], $\omega = 0.93$ [0.93, 0.94]). The SAS was positively correlated with ISI ($r = 0.8$), DBAS-16 ($r = 0.76$), AAQ-II ($r = 0.63$), HADS-A ($r = 0.64$), HADS-D ($r = 0.56$), and negatively correlated with SPAQ ($r = -0.63$).

Conclusions: Preliminary evidence suggests that the SAS is a valid tool to assess acceptance of sleep.

ID: 1383

Contribution for the Neuroanatomy of Narcolepsy Associated to the Atrophy of Midbrain in Progressive Supranuclear Palsy

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Keywords

- ▶ narcolepsy
- ▶ progressive supranuclear palsy
- ▶ hypocretin
- ▶ midbrain atrophy

Introduction: Narcolepsy type 1 (NT1) is a lifelong sleep disorder affecting 1:2000 individuals. The disease is characterized by excessive daytime sleepiness, cataplexy and other abnormal manifestations of REM sleep, such as sleep paralysis and hypnagogic hallucinations. Recently, it was discovered that the pathophysiology of (idiopathic) narcolepsy-cataplexy is linked to the loss of hypocretinergic neurons in the lateral hypothalamus. (Barateau et al., 2022). Sleep disorders are important manifestations of neurodegenerative disorders and eventually are clinically evident before the onset of other neuropsychiatric features (Hauw et al., 2011). Symptomatic or secondary narcolepsy refers to the symptoms of narcolepsy occurring during the course of other brain disorders. Progressive supranuclear palsy (PSP) is an atypical parkinsonism related to 4R tauopathy. Neuropsychiatric symptoms include apathy, depression, anxiety, disinhibition and impulsive behavior (Fabbri et al., 2019). A wide range of sleep disorders that include insomnia, rapid eye movement sleep behavior disorder, periodic limb movement disorder, excessive daytime sleepiness, and sleep apneas, may complicate the course of the Parkinson plus disorders, but narcolepsy is rarely mentioned (Bhattacharya et al., 2020). Besides that, little is known about the neuropathology of narcolepsy (Hauw et al., 2011).

Aim: To describe a patient with narcolepsy associated to focal midbrain atrophy in progressive supranuclear palsy.

Methods: Design: Case report. Setting: The Colorado Neurological Institute Movement Disorders Center in Englewood, Colorado, and the Mayo Clinic in Rochester, Minnesota. Patient: A 62-year-old woman with a neurological disorder characterized by Richardson's syndrome presented with narcolepsy (excessive daytime sleepiness, cataplexy, and other abnormal manifestations of REM sleep), and Godot's syndrome in the setting of midbrain atrophy. Intervention: symptomatic treatment for parkinsonism and sleep disorders. Main outcome measures: Polysomnography, multiple sleep latency test, and neurological examination and neuroimaging.

Results: Treatment with a modafinila improved daytime somnolence.

Conclusions: This is the first report associating narcolepsy with primary PSP (Richardson's syndrome). Symptomatic treatment of narcolepsy is beneficial even in the presence of midbrain atrophy in PSP.

ID: 1384

A Network Approach of Insomnia and Dysfunctional Beliefs and Attitudes about Sleep

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Keywords

- ▶ network analysis
- ▶ insomnia
- ▶ beliefs

Introduction: Cognitive processes are crucial to several models of insomnia. Negatively toned cognitive activity triggers arousal and distress, channeling attention and monitoring to sleep, and creating distorted perceptions. Challenging unhelpful beliefs about sleep is a crucial element of cognitive-behavioral therapy for insomnia. Understanding how this network of beliefs connects to insomnia severity may provide leads to help targeted interventions.

Aim: To use a network analysis of cross-sectional data to investigate the associations of dysfunctional beliefs and attitudes about sleep with overall insomnia severity, in a sample of Brazilian adults.

Methods: Data were collected from surveys responded by 1376 adults, aged 18 to 59 years, both with and without insomnia symptoms. Participants completed online self-report questionnaires, including, Insomnia Severity Scale (ISI) and Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16). Gaussian Graphical Models were estimated using the GLASSO regularization and EBIC model selection with hyperparameter set to 0.5. We first estimated a network describing the associations among overall insomnia severity and the four factors of DBAS-16. Subsequently, we estimated a network describing the associations among insomnia severity and each of the individual items of DBAS-16. The stability of node strength was estimated using a case dropping bootstrap procedure (1000 iterations). Node centrality was assessed by strength, closeness, and betweenness – these measures indicate how important nodes are in a network.

Results: Worry about sleep was a highly central symptom, indicating its importance as possible target for cognitive-behavioral therapy for insomnia. Nodes with high centrality indices are important in the flow of information through the network. Surprisingly, we found a negative partial correlation between sleep expectations and insomnia severity. Belief that a poor night of sleep would ruin functioning on the next day emerged as the item with highest strength, closeness and betweenness. Another item with high centrality indices referred to feelings that insomnia is ruining one's ability to enjoy life.

Conclusions: This network analysis of insomnia severity and beliefs about sleep provides important insights as to which beliefs may be the most important targets for cognitive-behavioral interventions. This analysis may also provide some useful preliminary data to estimate causal effects.

ID: 1385**Association between Food Consumption and Characteristics of Sleep and Circadian Rhythmicity**

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Keywords

- ▶ pediatric obesity
- ▶ actimetry
- ▶ circadian rhythm

Introduction: When studying the inherent aspects of sleep it is important to assess how the quality and quantity of sleep in the last two decades may be one of the reasons for the increase in childhood obesity, which has been growing rapidly worldwide. This study aims to evaluate the association of diet with circadian rhythm in children and adolescents with obesity.

Aim: The objective is to evaluate the association of diet with circadian rhythms in children and adolescents with obesity.

Methods: An analytical observational cross-sectional study was conducted with data collection from 43 patients between 6 and 13 years old diagnosed as overweight seen in outpatient clinics of the public health system. For the analysis of the activity-rest rhythm the study participants used the Actrust model actimeter for a period of 7 days and completed the 6-day Food Consumption Record to collect energy and macronutrient intake.

Results: To verify if the food consumption could interfere in the circadian rhythm of the researched patients, the tests of Statistical Analysis Linear Regression and the Binary Logistic Regression were used with the analysis of the “r” through the Correlation Classification for the data collected through of the actimeter and the energy intake of the patients in 6 days of food consumption. The correlations of energy and macronutrient intake with the variables Relative Amplitude and L5 were negative, while with the M10 Value the correlation was very weak positive, demonstrating that there is no relationship between energy intake and activity-rest in the same period. In our study, the only parameter to show statistical significance ($p < 0.05$) with the activity-rest data was age in relation to the M10 value, which may be characteristic of greater diurnal activity for older patients with higher food consumption. When comparing the risk for sleep disorders with the parameters of circadian rhythm, the variables L5 onset and M10 onset had a positive association with SVTD, indicating a possible phase change associated with sleep disorders.

Conclusions: No association was identified between macronutrient intake and the Relative Amplitude of the activity-rest rhythm, with the average activity of the day (M10) and with the average activity during the night (L5) in the studied sample.

ID: 1386**Development and Validation of a Sleep Staging Classification Model for Healthy Adults Based on a Single-channel EEG Device**

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Keywords

- ▶ electroencephalogram
- ▶ medical software
- ▶ sleep tracker
- ▶ wearable devices

Introduction: Despite its recent expansion, the validation of wearable devices for sleep monitoring is still deficient. Data regarding sleep stages are inaccurate and do not reflect those obtained by polysomnography, the gold standard method in Sleep Medicine, such as results for “light sleep” and “deep sleep,” stages that do not correspond to the ones formally defined by the American Academy of Sleep Medicine.

Aim: To perform the techno-scientific validation and evaluate the accuracy of a classification model for sleep staging using a single-channel electroencephalogram (EEG) device in association with wrist actigraphy for the development of a classification model for sleep staging.

Methods: We included healthy individuals aged between 20 and 40 years, no sleep disorders. The procedure consisted of one full-night type-I polysomnography in which two sets of additional devices were tested: (A) flexible EEG band+actigraph and (B) rigid EEG band+actigraph. Data were segmented according to the polysomnography stages (30-second epochs), the specific characteristics of each sleep stage were extracted, and the classification model was developed. The model was tested to verify its final accuracy (sensitivity, specificity tests and an error matrix). The prior sample size calculation showed a minimum of 8 individuals per combination of devices.

Results: We recruited 23 individuals (50% men, mean age: 31 ± 4 years, mean BMI: 24 ± 3 kg/m²), 12 for combination A and 11 for B. We tested three classifiers (Decision Tree, Support Vector Machine, and Naive Bayes). For combination A, the mean accuracy was 94% and the individual accuracy for each stage was: 98% for wakefulness, 69% for N1, 97% for N2, 97% for N3 and 91% for REM. The highest error rate was observed for N1 (31%) - mostly confounded with REM (15%), N2 (8%), and wakefulness (8%). For combination B, the mean accuracy was 90% and the individual accuracy for each stage was: 83% for wakefulness, 78% for N1, 97% for N2, 99% for N3 and 96% for REM. The highest error rate was observed for N1 (21%) - mostly confounded with N2 (9%) and with wakefulness (13%). The actigraph presented a minor contribution to the classification model, maybe due to its reduced temporal resolution.

Conclusions: We developed a precise and accurate model for sleep staging for healthy adults on two single-channel EEG devices, with similar performance on both, which evidences the agnostic potential of the classification model.

ID: 1387**Sleep Bruxism and Biological Rhythm in School-based Sample from the City of Piracicaba, SP, Brazil**

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Keywords

- ▶ sleep bruxism
- ▶ circadian rhythm
- ▶ children
- ▶ bruxism
- ▶ pediatric dentistry

Introduction: The possible association between sleep bruxism and variables responsible for the disruption of the biological rhythm in children may contribute to the understanding of the multifactorial etiology of bruxism.

Aim: To verify whether children with possible sleep bruxism (PSB) had alterations in their biological rhythm and to explore the possible factors involved, such as sleep characteristics, screen time, breathing, sugary food consumption, clenching teeth during wakefulness reported by parents/guardians.

Methods: Data were collected by online interview from 178 parents/guardians of students aged 6 to 14 years, enrolled in five public schools in Piracicaba, SP. The frequency of PSB, sociodemographic data, time of sugary, sleep data were assessed through anamnesis. The Biological Rhythm Interview Assessment in Neuropsychiatry for Kids (BRIAN-K) was applied during online interviews. It was composed by four domains (1) sleep, (2) daily routine activities, (3) social behavior and (4) eating and questions about predominant rhythms related to disposition, concentration, and change day to night. Three groups were formed: (1) without possible sleep bruxism (WPSB), (2) with possible sleep bruxism sometimes (PSBS) and (3) with possible frequent sleep bruxism (PSBF).

Results: The number of boys with PSB was similar to that of girls ($p = 0.153$); body variables and sociodemographic variables were similar between groups ($P > 0.05$); the total value of the BRIAN-K Scale for the 4 domains was significantly higher for the PSBF group compared with WSB group; first domain of BRIAN-K scale, sleep, presented a significantly higher values for the PSBS and PSBF, while in the other three domains, no significant difference between groups occurred, as well as for predominant rhythm. The only factor that differed between the groups in the bivariate analysis was clenching teeth, as the number of children with possible sleep bruxism sometimes was significantly higher (χ^2 , $p = 0.005$). Multivariate ordinal logistic regression showed that socio-demographic variables were not associate with PSB, were first domain of the BRIAN-K scale, sleep, ($p = 0.004$), and clenching teeth ($p = 0.022$) were positively associated with PSB (OR 1.19 and 2.35, respectively).

Conclusions: Difficulties in maintaining sleep rhythm and clenching teeth during wakefulness reported by parents/guardians may determine a greater chance of children to increase the frequency of possible sleep bruxism.

ID: 1388

Comparison of the Sleep Parameters, Physical Activity Level and Sedentary Behavior between Hospitalized and Non-hospitalized Post-COVID-19 Patients

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Keywords

- ▶ sleep quality
- ▶ physical activity
- ▶ sedentary behavior
- ▶ somnolence
- ▶ post-COVID

Introduction: COVID-19 is associated with poor sleep quality and post-infected patients experience greater sleep

disruption and are more susceptible to sleep disorders. In addition, after infection, these patients may show a reduction in the level of physical activity and an increase in sedentary behavior.

Aim: To compare the objective and subjective assessment of sleep parameters, physical activity level and sedentary behavior between hospitalized and non-hospitalized post-COVID-19 patients.

Methods: This is a cross-sectional study with 32 post-COVID-19 patients, 20 inpatients (G1) and 12 outpatients (G2). We evaluated sleep quality (SQ) using the Pittsburgh Sleep Quality Index (PSQI), excessive daytime sleepiness (EDS) using the Epworth sleepiness scale (ESS), objective sleep parameters and the level of physical activity through of the Fitbit 3 motion monitor, which was used by the patients for 7 days. For the subjective assessment of the level of physical activity, the international physical activity questionnaire (IPAQ) was used. Data were analyzed in Microsoft Excel and the Student *t*-test for independent samples was used for comparison between groups (significance level $p < 0.05$). Results are shown as mean, standard deviation and percentage.

Results: The prevalence of active individuals was higher in G1 (83.3% versus 50%) and the time spent in sedentary behavior was higher in G2 (926.5 ± 168.6 min versus 734.1 ± 337.9 minute; $p = 0.046$). There was no difference between the groups in the other parameters of physical activity evaluated: number of steps ($p = 0.300$); calories burned ($p = 0.312$); distance traveled ($p = 0.342$); minutes of light ($p = 0.608$), moderate ($p = 0.083$) and intense ($p = 0.104$) activity. The prevalence of poor SQ was higher in G1 (85% versus 66.66%), whereas EDS was more prevalent in G2 (45% versus 50%). In objective sleep parameters, there was no difference between the groups: total sleep time (TTS) ($p = 0.699$); sleep efficiency ($p = 0.858$); wake episodes per night (WE) ($p = 0.508$); wake after sleep onset (WASO) ($p = 0.674$).

Conclusions: In the present study, post-COVID-19 patients who required hospitalization had a higher prevalence of poor sleep quality. On the other hand, patients without hospitalization had a higher prevalence of EDS and, despite being more active, exhibited more time in sedentary behavior.

ID: 1390

Bacteriological Safety in Home Titration with Automatic Continuous Positive Airway Pressure

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Keywords

- ▶ automatic positive airway pressure
- ▶ filter
- ▶ adapter
- ▶ titration

Introduction: The automatic continuous positive airway pressure equipments (autoCPAP/APAP/autoPAP) are used to perform home titration, providing more comfort to the patient. With the emergence of the SARS-CoV2 pandemic, exams were suspended due to the risk of contamination.

Aim: To assess the level of contamination in autoCPAP equipments used in home titration.

Methods: This is a case study, where bacteriological tests were performed with swab collection at the room air inlet of four autoCPAP devices. The sample was by convenience, in which four patients were randomly selected to perform CPAP titration at home, all with a diagnosis of moderate to severe obstructive sleep apnea (AHI>15) who underwent polysomnography in the laboratory. It should be noted that the hygienic conditions of the residence (room) are unknown. The sample was divided into two moments (Time 1 (T1)=foam filter + barrier filter placed in the autoCPAP air inlet; and, Time 2 (T2)=HEPA filter adapter placed in the autoCPAP air inlet), each patient participated in both moments for a period of 7 days. The swab collection in autoCPAP was performed before and after each of the moments in the laboratory environment.

Results: The average time of use of devices in operation at home at night in T1 was 5h03min and T2 was 5h17min. When the foam filter and barrier filter (T1) were used, the devices showed contamination after 7 days of use in the patients' homes. When the HEPA filter adapter (T2) was used, the devices showed no contamination.

Conclusions: The use of the HEPA filter adapter in autoCPAP devices proved to be a preventive and safe procedure when used at home.

ID: 1391

Effects of Different Training Load Magnitudes on Sleep Pattern and Mood State in Young Soccer Players

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Keywords

- ▶ actigraphy
- ▶ physical training
- ▶ workload
- ▶ football

Introduction: Young athletes are exposed to successive periods of changes in training loads, which can affect their sleep-related health and mood states.

Aim: To analyze the effect of different training load magnitudes on sleep patterns and mood states in young soccer players.

Methods: 13 young soccer players (15.93 ± 0.59 years; 68.70 ± 6.12 kg; 1.75 ± 0.07 m; 22.30 ± 0.97 kg/m²), were evaluated by 3 weeks of training during a pre-season. The external training load (ETL) was verified by the PlayerLoad method, while the internal training load (ITL) was determined by the Subjective Perceived Effort of session (sRPE) method. Pulse actigraphy was used to monitor sleep. Sleep variables, including time in bed (TIB), total sleep time (TST), sleep latency (SL), wake after sleep onset (WASO) and sleep efficiency (SE) were evaluated on every night. Mood state was assessed using the Brunel Mood Scale (BRUMS). Repeated measures ANOVA was used to verify the effect of time. Friedman's test was used for data that did not meet normality assumptions (sleep latency and mood states). Bonferroni's post-hoc was used to verify point differences.

Results: Week 2 showed higher ETL and ITL compared with weeks 1 and 3 ($p < 0.001$). There was a significant improvement in sleep during week 2 (TIB: +35 minute, $p = 0.044$; TST: +46 minute, $p = 0.003$; SL: -5 minute,

$p = 0.001$; SE: +3%, $p = 0.019$). There was no difference in the BRUMS scale component: tension ($p = 0.378$), depression ($p = 0.311$), anger ($p = 0.148$), vigor ($p = 0.178$), fatigue ($p = 0.063$), and confusion ($p = 0.630$) during the three weeks analyzed.

Conclusions: During a microcycle with higher training loads there was no change in the mood state of athletes and possibly the longer total sleep time may, at least in part, explain this finding.

ID: 1393

The Use of Social Networks and Sleep Quality in Medicine Academics in the COVID-19 Pandemic

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Keywords

- ▶ sleep-wake disorders
- ▶ social isolation
- ▶ student health
- ▶ sleep hygiene

Introduction: Sleep is physiologically a reversible behavioral state that has several essential functions for the body, such as energy saving; role in neuronal plasticity; episodic memory consolidation and learning. The literature reports that the period of social isolation, caused by the COVID-19 pandemic, brought the hyperconnectivity of subjects as one of the harms. Given this scenario, it is hypothesized that the excessive use of social networks can, in turn, cause negative consequences for the health of the population.

Aim: The objective of this study was to analyze the relationship between social media use and self-reported sleep quality in medical students before and during the pandemic.

Methods: A questionnaire containing 3 personal questions and the Pittsburgh Sleep Quality Index (PSQI) was randomly applied to medical students via Google Forms, to assess the quality of sleep before and during the pandemic. The groups were compared using the paired *t*-test, and a significance value of $p < 0.05$ was adopted.

Results: Out of the 150 medical students that participated in the study, 90% said that social isolation affected sleep quality and only 10% did not observe any changes. Total sleep quality showed a statistically significant worsening ($p < 0.0001$) during the pandemic period compared with the same period before Covid-19 ($p < 0.0001$), in all sleep components (subjective sleep quality, latency of sleep, sleep time, use of sleep medication, and overall PSQI score) worsened over the course of the pandemic. The amount of social networks used showed no statistically significant difference.

Conclusions: The results suggest a significant worsening in the general sleep status of medical students when evaluated before and during the COVID-19 pandemic, which may be related to social isolation and increased use of social networks.

ID: 1397

Is Sexual Function Deteriorated in Postmenopausal Women with Obstructive Sleep Apnea and Insomnia?

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Keywords

- ▶ sleep
- ▶ obstructive sleep apnea
- ▶ insomnia
- ▶ menopause
- ▶ sexual function
- ▶ climacteric symptoms

Introduction: Sleep and sexual activity are commonly disturbed in postmenopausal women due to a decline in hormone levels. Insomnia and obstructive sleep apnea (OSA) can reach a prevalence of 31% and 44% of postmenopausal women, respectively, which can affect women's wellness.

Aim: The aim of this study was to investigate the climacteric and sexual symptoms of postmenopause women with both sleep disorders (insomnia and OSA) and compare with women with only insomnia or with only OSA.

Methods: Our sample comprised 47 postmenopausal women distributed into 3 groups: 1) insomnia, 2) OSA, and 3) OSA + insomnia. All participants completed the questionnaires: Insomnia Severity Index, Female Sexual Function Index, and Blatt-Kupperman menopausal index. Of the 47 participants, 34 women had undergone polysomnography. The 3 groups were compared in respect of climacteric symptoms, sexual function score, and sleep.

Results: Our results showed that 85.1% of the postmenopausal women were classified with insomnia, 46.8% were diagnosed with OSA, and 82.9% had low sexual function. All groups had sleep efficiency < 80%, wake after sleep onset > 65 minute, and a total sleep time < 6h, indicating poor sleep quality. There were no statistically significant differences among the groups in all sexual domains. The group of OSA + insomnia reported more climacteric symptoms (27.1 ± 9.7) when compared with OSA group (15.7 ± 9.6).

Conclusions: In our sample, the presence of insomnia and OSA associated with postmenopause revealed a low score for sexual function. Climacteric symptoms were higher in the groups with insomnia, and the association with low sexual function can lead to worsening of clinical condition.

ID: 1398

Insomnia is Common in Patients with Hypertension and Associated with Higher Need of Anti-hypertensive Drugs

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Keywords

- ▶ sleep disorder
- ▶ Insomnia
- ▶ hypertension

Introduction: Insomnia is a common sleep disorder characterized by the difficulty in initiating and/or maintaining sleep and/or waking up earlier than desired despite appropriate opportunities for inducing sleep. Previous studies have shown that insomnia may increase the risk of incident hypertension (HTN), but it is not clear the potential impact of insomnia in patients with HTN.

Aim: To evaluate whether insomnia may impact blood pressure (BP) values and BP control in adult patients with an established diagnosis of HTN recruited from a Tertiary University Center.

Methods: We recruited consecutive patients under regular treatment for HTN from December 2021 to July 2022. The evaluation was performed through interviews and validated questionnaires for the evaluation of insomnia, in addition, a clinical evaluation was done and included clinical history data such as the number of antihypertensive drugs in use, comorbidities, anthropometric data collection and the standardized measurement of BP (obtained by the average of 03 measurements using a validated digital device). The SPSS statistical program was used for statistical evaluation of the data.

Results: Three hundred consecutive patients were evaluated (64% female, median age 63 years, 54.6% obese, number of antihypertensive drug classes: 4.4 ± 1.6). The prevalence of insomnia was 51%. Patients with and without insomnia were homogeneous regarding several variables including age and obesity, but the group with insomnia had a higher percentage of women (75.2% vs 52.4% $p < 0.001$). Compared with patients without insomnia, patients with insomnia had a higher rate of ≥ 4 antihypertensive drugs use (64.6 versus 75.8%; $p = 0.034$). Despite the higher use of antihypertensive drugs, the group with insomnia tended to have a lower rate of office BP control when considering the < 140x90mmHg cut-off in the office (69.3 versus 59.9%; $p = 0.088$).

Conclusions: Insomnia is quite common in patients with hypertension and associated with a greater use of number of antihypertensive drugs in parallel to a trend toward a lower rate of BP control.

ID: 1399

Do Women with Dysmenorrhea Present Altered Sleep and Inflammatory Mediators' Levels?

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Keywords

- ▶ sleep
- ▶ dysmenorrhea
- ▶ inflammation
- ▶ menstruation
- ▶ hormonal contraceptive
- ▶ inflammatory mediators

Introduction: Painful menstruation is the main symptom of dysmenorrhea, a dysfunction that affects more than 50% of women during reproductive phase. It is a recurrent inflammatory pathology that can strongly impact women's life by causing academic and work absenteeism, social problems, lower performance, and sleep complaints.

Aim: The objective of this study was to analyze the level of inflammatory mediators and the sleep of women with

dysmenorrhea (Dysm) during menstruation (Menst) and compare them to healthy women and among non-menstruated (Non-Menst) and oral contraceptive (OC) use women.

Methods: We distributed 328 women into 6 groups: Dysm + Menst ($n = 35$); Dysm + NonMenst ($n = 83$); Dysm + OC ($n = 45$); Menst ($n = 26$); NonMenst ($n = 88$) and OC ($n = 51$). All these groups have undergone a one-night polysomnography (PSG) and had IL-6, Tumor Necrosis Factor (TNF) and C-reactive protein (CP) measured. Menstruation and painful menstruation episodes were asked and reported on the night of the PSG by gynecological questionnaire to enable group distribution. For statistical analysis, we used Generalized Linear Model, and Sequential Bonferroni post hoc test which corrects for multiple comparisons.

Results: The groups of Dysm + NonMenst and Dysm + Menst showed lower sleep efficiency ($82.8\% \pm 1.54$; $79.7\% \pm 2.4$, respectively) when compared with group using OC ($88.8\% \pm 0.99$). The CP was found significantly increased in Dysm + OC women ($0.45\text{mg/dL} \pm 0.05$) when compared with NonMenst ($0.27\text{mg/dL} \pm 0.02$) and Dysm + NonMenst ($0.24\text{mg/dL} \pm 0.02$) women. The TNF level was statistically higher in NonMenst women ($9.9\text{pg/mL} \pm 0.69$) compared with Menst women ($7.73\text{pg/mL} \pm 0.67$). Sleep latency, total sleep time, awakenings/hour, N1, N2, N3, REM sleep and IL-6 had not presented any statistical differences among the groups investigated.

Conclusions: Our results indicated that dysmenorrhea did not affect the sleep efficiency of women using OC; however, this condition was related to increased cardiovascular risk in these women.

ID: 1400

Sleep Quality of Elderly Brazilians during the COVID-19 Pandemic

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Keywords

- ▶ sleep
- ▶ elderly
- ▶ COVID-19

Introduction: More than two years ago, the World Health Organization (WHO) declared the COVID-19 pandemic. With this, social isolation was adopted to contain the virus. Consequently, people suffered changes in the family routine and mainly the elderly as for self-protection. It is already known the aging process, by itself, affects sleep characteristics, so it is relevant to understand eventual modifications in the quality of sleep of the elderly during the pandemic period.

Aim: To analyze the sleep quality of the elderly along the COVID-19 pandemic.

Methods: This is part of a populational based longitudinal study, performed from April 2020 to June 2021. Participants were invited through social networks and through the internet, radio and TV in two periods (April-July 2020 and April-July 2021) to answer an online questionnaire, through the Qualtrics online survey software platform. Responders with over 65 years old, were selected and responded the questionnaires Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). Further they have completed sociodemographic information. The present study was approved and is registered in Plataforma Brazil under the number 30748320.5.0000.5336.

Results: The participants were divided into three groups, the first group comprises 198 responders from 2020 (E1), the second group were 51 responders from 2021 (E2) and third group were 38 respondents for both years (2020-2021) (E3). The variables that prevailed in the three groups were: female (E1) 70.5%, (E2) 64.8%, and (E3) 63.2%; white ethnicity (E1) 84.5%, (E2) 86.3%, and (E3) 86.8%; family income > BR\$ 11,261.00 (E1) 54%, (E2) 58.8%, and (E3) 60.5%. In 2021 (E2) 88.2% of the elderly claimed that they were not infected by COVID-19, but 90.2% reported that family members/close friends were infected and, in addition, 55.9% had a close family member who died from the disease. Regarding the quality of sleep in the group (E1) 50.8% had worsened sleep; in (E2) 60.8% and in the group (E3) in 2020 (63.9%) and 2021 (57.9%). An increase in the prevalence of sleep disorders was observed in the group (E3), which in 2020 was 15.8% and in 2021 it was 26.4%. In 2021, in E3, excessive daytime sleepiness increased up to 52.6%.

Conclusions: The decrease in sleep quality and the increase in excessive daytime sleepiness in the elderly were possibly linked to the social isolation imposed by the COVID-19 pandemic.

ID: 1402

Evaluation of the Effect of Pramipexole and Exercise on Restless Legs Syndrome

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Keywords

- ▶ dopaminergic agonists
- ▶ periodic leg movement
- ▶ polysomnography

Introduction: Restless legs syndrome (RLS) is a sleep-related movement disorder, which manifests as an uncontrollable desire to move, especially the legs, to relieve uncomfortable sensations. These symptoms are worse in the late afternoon and at night and can be relieved through movement. Pramipexole (PPX) is used as a first-line treatment for RLS. However, its chronic or continuous use may increase the severity of RLS symptoms (augmentation). Besides that, the exercise has positive effects in reducing RLS symptoms.

Aim: The objective of the study was to evaluate the effect of treatments with PPX and exercise on the sleep pattern in an experimental model of RLS (Spontaneously Hypertensive Rats/SHR).

Methods: For this, the animals were divided into 4 groups: 1) SHR control (CTRL); 2) SHR chronic exercise (CE); 3) SHR pramipexole (PPX) and, 4) SHR chronic exercise and pramipexole (CE + PPX). PPX treatment was performed at a dose of 0.125 mg/kg (daily, i.p.) during four weeks. To assess the sleep pattern, electrocortical and electromyographic analyzes were performed in the period between 2 and 6 AM. The following sleep parameters were examined: Total Sleep Time, Sleep Efficiency, Arousals, Wakefulness, Slow Wave Sleep, REM Sleep, and Limb Movements. Data were analyzed SPSS Statistics (version 25 IBM corporation).

Results: The results showed that the use of PPX reduced statistically the percentage of sleep efficiency, as well as REM sleep and increased wakefulness, in relation to the control group. Thus, considering that increased

wakefulness is associated with worsening of RLS symptoms, we suggest that PPX caused the augmentation effect.

Conclusions: Although no statistically significant differences were observed with exercise, the literature already demonstrates its positive effect in reducing RLS symptoms. Thus, it is of great importance to carry out other studies that evaluate the effect of exercise through other protocols, in the period from 2 AM to 6 AM in SHR rats.

ID: 1403

REM Sleep Behavior Disorder is Associated to Falls in the Elderly: A Systematic Review

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Keywords

- ▶ REM sleep behavior disorder
- ▶ falls
- ▶ elderly

Introduction: Unintentional injuries are leading causes of death in the elderly, with falls ranking second. Evidence shows that ~40% of seniors residing at home will fall at least once a year. The increasing prevalence of falls in elderly populations per year has been reported globally, as 31% in the United States, 20–30% in Canada, 25.6% in Australia, and 27.6% in Brazil. REM sleep behavior disorder (RBD) is characterized by dream enactment and loss of muscle atonia during REM sleep. RBD is a common cause of falls potentially leading to severe injuries. Therefore, the relationship between both should be clarified and discussed.

Aim: To evaluate the association between RBD and the occurrence of falls in the elderly.

Methods: This systematic review that adopted the following descriptors: probable RBD; falls; elderly. Inclusion criteria: articles comprising elderly people ≥ 65 years, both sexes, with an investigation of the number of falls in the previous 12 months, polysomnography performed to identify RBD, studies published in the last five years. Exclusion criteria: studies performed on animals, abstracts and congress letters, review articles.

Results: A total of 509 studies were found in the virtual databases, after which 5 articles were selected according to the inclusion criteria for complete analysis, $n = 12,211$. The following results were observed: 1. RBD was associated with a higher occurrence of falls; 2. The occurrence of falls did not vary significantly concerning the level of education, occupation, average income, smoking, alcohol consumption, physical activity; 3. The percentage of women who reported falls was higher than men; the average number of women was 68.3%, while that of men was 31.7%. 4. Among those reporting falls, the average number of falls during the previous year was 1.66 ranging from 1 to 14 falls. 5. The following factors were associated with the occurrence of falls in the previous year: difficulty falling asleep, poor sleep quality, difficulty maintaining sleep, and daytime sleepiness. Furthermore, indices of

sleep fragmentation were also associated with an increased risk of falls.

Conclusions: A systematic review of the literature showed a positive relationship between RBD falls, particularly in older women. Those RBD patients who live alone, live alone, have never been married, and are single, seems to be more prone to fall. Therefore, directed preventive measures should be developed to avoid potentially severe sequelae.

ID: 1404

Relationships between Training Loads and Sleep Standard in Young Football Players

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Keywords

- ▶ monitoring
- ▶ physical training
- ▶ actigraphy
- ▶ football

Introduction: Young athletes, during the pre-season and season phases, are exposed to successive periods of changes in the magnitude of training loads, which can directly affect the quantity and quality of sleep.

Aim: To analyze the influence of different training load magnitudes on sleep parameters and their relationship with sleep-related variables.

Methods: 13 young male soccer athletes (15.93 ± 0.59 years; 68.70 ± 6.12 kg; 1.75 ± 0.07 m; 22.30 ± 0.97 kg/m²) were evaluated during 3 weeks of training with different workload magnitudes in the pre-season period. The external training load (ETL) was verified by the PlayerLoad method, while the internal training load (ITL) was determined by the session's Subjective Perceived Exertion (RPE) method. Pulse actigraphy was used to monitor sleep. Sleep variables, including time in bed (TIB), total sleep time (TST), sleep latency (SL), wake after sleep onset (WASO) and sleep efficiency (SE) were evaluated on every night of post-workout sleep. Repeated measures ANOVA was used to verify the effect of time. Friedman's test was used for data that did not meet normality assumptions (sleep latency). Bonferroni's post-hoc was used to verify point differences. Pearson and Spearman correlations were used to verify associations between training loads and sleep-related variables.

Results: Week 2 had the highest workload, with a significant increase in ETL ($p < 0.001$) and ITL ($p < 0.001$) when compared with weeks 1 and 3. In addition, there was a significant improvement in sleep parameters during the week with the highest training load (TIB: +35 minute, $p = 0.044$; TST: +46 minute, $p = 0.003$; SL: -5 minute, $p = 0.001$; SE: +3%, $p = 0.019$). There was a very strong correlation between ETL and ITL ($r = 0.783$; $p < 0.001$), moderate correlation between ETL and TST ($r = 0.340$; $p = 0.037$), ITL and TST ($r = 0.458$; $p = 0.003$), ITL and SE ($r = 0.359$; $p = 0.025$).

Conclusions: During a microcycle with higher loads, there is an increase in TIB, TST, SE and a reduction in SL. In addition, there was a direct and moderate correlation between training load, total sleep time and sleep efficiency.

ID: 1405**Central Sleep Hypersomnia after Covid-19 Infection: Serial Case Reports**

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Keywords

- ▶ narcolepsy
- ▶ COVID-19
- ▶ hypersomnia

Introduction: Despite public health concerns about the acute effects of the recent pandemic viral infection, SARS-COV2, chronic broad-spectrum manifestations draw attention, similarly to post-viral syndromes described in survivors of other virulent coronavirus epidemics.

Aim: We described three patient that's reported a significant hypersomnia after COVID-19 infection with a good response to modafinil and methylphenidate.

Methods: We performed a longitudinal follow-up of the three patients, through regular consultations, evaluation and response to prescribed medications.

Results: We report 3 patients, 2 females and 1 male diagnosed whit Central Sleep Hypersomnia after Covid-19 infection. The median age of the cases was 34 years. Covid-19 infection in March, November and December 2020. Three to five months after initial symptoms, the patients continued reporting fatigue, cognitive complaints and excessive sleepiness with naps occurring frequently in inappropriate situations, as on work desk and non-restorative sleep of 8 to 12 hours. Before the infection, the patients were a regular of sleep pattern, with 5 to 6 hours of restorative sleep per night. Physical examination: The median Epworth Sleepiness Scale (ESS) scored 21 out of 24. The neurological exam: showed hyposmia in one of the patients. Complementary exams: Brain MRI showed signs of olfactory bulb atrophy/hypoplasia in one case. Laboratory tests were normal. Polysomnography and multiple sleep latency test (MSLT) revealed a reduction of sleep onset latency in 5 out of 5 tests of MSLT in all patients, with an average sleep onset latency of 1.9 minutes. Early onset REM sleep was evidenced at every opportunity in the TMLS in one of our patients. Compatible with the diagnosis of Narcolepsy. The all patients started treatment with modafinil 200mg/day. After one month of treatment, the patient improved with a decrease in the daily sleep time (median ESS = 15). The dose of modafinil was increased to 400mg/day, but in one patient reported headache. We returned modafinil to previous dose and added methylphenidate 10mg/day. The ESS average was 8, after optimized treatment.

Conclusions: As far as we know, persistent hypersomnia has not been previously reported in patients with post COVID-19 infection. The temporal association between the onset of somnolence and the COVID-19 suggests a possible correlation. Central hypersomnia may expand the spectrum of post-COVID sleep disturbances.

ID: 1406**Post-traumatic Stress Disorder and Sleep Disturbances after Kidnapping of a Bus on the Rio-Niteroi Bridge: A Case Series Report**

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Keywords

- ▶ post-traumatic stress disorder
- ▶ acute stress disorder
- ▶ sleep
- ▶ polysomnography

Introduction: Post-traumatic stress disorder (PTSD) is the most common mental disorder resulting from a severe traumatic event and can only be diagnosed after 30 days of the stressful event. Currently, there are few data in the literature comparing sleep alterations that occur in the period before and after these 30 days, in the same individuals.

Aim: The aim of this study was to describe possible sleep disorders and psychiatric symptoms and to study the possible relationships between them in individuals who collectively experience a traumatic event. In addition, it intends to contribute to broadening and deepening knowledge on the subject, adding new data on the relationship between acute stress disorder, PTSD and sleep.

Methods: Ten victims were assessed a few days after the bus was hijacked on the Rio-Niterói bridge. They were residents of São Gonçalo/RJ, a historic population that was repeatedly exposed to all kinds of violence. Follow-up lasted between one and sixteen months. A sociodemographic profile was drawn and a periodic assessment of quality of life, mental health and sleep was performed (using the PCL-5, SF-36, THQ, BDI-II, BAI, ESE, PSQI and SCID-5-CV), in addition to the polysomnography.

Results: All participants had at least one sleep complaint at the first assessment, with insomnia and nightmares the most prevalent complaints. Four participants (female) had acute stress disorder (ASD). Two of these progressed to PTSD and 3 reported bizarre or trauma-related visual hallucinations within the first month. Overall, 4 participants developed PTSD and 7 required pharmacotherapy to treat PTSD, mood disorder, generalized anxiety disorder, and alcohol use disorder. The absence of anxiety symptoms a few days after the trauma, early psychiatric intervention and rapid correction of sleep disturbances were related to the non-development of severe mental disorders. Patients with a high number of traumatic events during their lifetime, a weakened social support network, long-term insomnia and nightmares, abusive use of alcohol, smoking, psychiatric comorbidities, poor adherence to early treatment, inadequate sleep hygiene or poor sleep quality had worse evolution.

Conclusions: The results of this study suggest that, in patients with ASD or PTSD, it is important to recognize possible protective and risk factors to initiate early psychiatric and sleep treatment and prevent chronification and worsening of the psychiatric condition.

ID: 1409**Type 4 Night Polygraphy as a Diagnostic Tool for Sleep Apnea in the Clinical Practice of Nurses**

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Keywords

- ▶ night polygraphy
- ▶ sleep apnea
- ▶ nurse

Introduction: The Nursing Consultation uses scientific method components to identify health-disease situations, prescribe and implement measures that contribute to the protection, promotion, recovery and rehabilitation of the individual's health. Sleep is a reversible physiological and behavioral state, characterized by a decrease in motor activity and an increase in the threshold of response to the environment, essential for health maintenance, learning and memory consolidation. Frequent sleep fragmentation can increase the risk of developing chronic diseases. Sleep apnea is a disorder that affects more than 30% of the population. In view of the above, it is necessary to investigate this disorder during the nursing consultation through night polygraphy type 4, so that the Nurse can assertively direct the patient to a multidisciplinary team.

Aim: To measure the degree of sleep apnea in patients undergoing type-4 night polygraphy.

Methods: This is a descriptive, quantitative, cross-sectional cohort study. 31 sleep tests were analyzed from July 2020 to June 2021 in the municipality of Surubim/PE, with the Oxistar device, a high-resolution oximeter with actigraph developed by a start-up. Data were analyzed and processed using IBM SPSS 25.0 software.

Results: The mean age of the sample was 39.77 ± 14.13 years; IDO of 4.91 ± 5.33 ; BMI of 27.40 ± 5.2 ; 94.77 ± 1.05 SpO2 mean; 85.93 ± 6.45 SpO2 minimum; 98.83 ± 1.06 basal SpO2; HR of 68.00 ± 9.75 BPM. A positive correlation was observed between BMI and ODI ($r = 0.459$; $p = 0.009$). There is no effect of sex ($p = 0.651$) and BMI ($p = 0.614$) on ODI, and no interactions between sex and BMI on ODI ($= 0.134$) were observed.

Conclusions: Although the scientific literature supports the hypothesis that male gender and high BMI contribute to greater episodes of ODI, the present study did not find an effect and interactions between sex and BMI on ODI, although there was a positive correlation between BMI and ODI. GONE. The sample n, although considerable, may be low for this type of analysis, requiring a more robust sample n. The 31 patients were instructed on good sleep habits and referred to the multidisciplinary team.

ID: 1412

Association of Adiponectin, Leptin, and Daytime Sleepiness in Women with Severe Obesity

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Keywords

- leptin
- adiponectin
- daytime sleepiness

Introduction: Metabolic alterations such as insulin resistance (IR), hyperleptinemia, and hypo adiponectinemia, are prevalent conditions in the obesity epidemic and are often associated with sleep disorders, worsening quality of life. Adipokines such as leptin and adiponectin have a pro-inflammatory and anti-inflammatory character, respectively. Individuals with obesity often present hypo adiponectinemia and hyperleptinemia state, which are associated with a worsening in sleep quality, duration, apnea, and sleep

disorders when evaluated by polysomnography. However, more viable and practical tools such as questionnaires should be studied for the daily clinical practice.

Aim: Assess whether daytime sleepiness is associated with ratios of adiponectin/leptin and leptin/adiponectin in women with severe obesity.

Methods: Forty-five women that were on the waiting list for bariatric surgery at a public hospital in Goiânia were included. Weight, height, and circumferences of the neck (NC), waist (WC), and hips (WC) were measured. Daytime sleepiness was assessed by Epworth Sleepiness Scale (ESS), blood samples were collected for analysis of glycemic parameters, lipid profile and adipokines. Leptin and adiponectin concentrations were determined by ELISA enzyme immunoassay method. Statistical analyzes were performed in SPSS. Data normality was verified by the Shapiro Wilk Test and Generalized Linear Models (GLZM) were used to compare the groups. Spearman/Pearson's correlation was performed to verify the correlation between sleep disorders and other variables. Volunteers were grouped according to the ESS classification into excessive (EDS) and Normal daytime sleepiness.

Results: The total sample had an average age of 40.1 ± 8.59 years; 48.19 ± 7.05 kg/m² of BMI; and increased circumferences. The prevalence of worst sleep quality was 42.2%. Individuals with EDS had a higher leptin/adiponectin ratio ($p = 0.009$), lower adiponectin/leptin ratio ($p = 0.007$). Positive correlation between ESS and glycated hemoglobin ($p = 0.00$; $r = 0.647$) was found.

Conclusions: Women with severe obesity and excessive daytime sleepiness has higher pro-inflammatory and decreased anti-inflammatory ratios. Also, is possible to observe an association of ESS and metabolic parameters. Thus, ESS proved to be a tool to be considered in clinical practice, correlating with inflammatory and metabolic parameters in women with severe obesity.

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ID: 1414

A Systematic Review on the Relationship between Restless Legs Syndrome and Risk of Falling in the Elderly

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Keywords

- risk of falling
- restless legs syndrome
- elderly

Introduction: Falls are frequent in the elderly, affecting 1:3 individuals over 65 years old. These events are among the leading causes of accidents in this age group. On the other hand, Restless Legs Syndrome (RLS), a frequent disorder in the aging population, may contribute as a causal factor to the increased risk of falls.

Aim: To evaluate the association between restless legs syndrome and fall risk in the elderly.

Methods: This is a systematic review using the PRISMA methodology. The descriptors were: restless legs syndrome, risk of falls, and elderly. Inclusion criteria: cross-sectional or prospective cohort studies comprising older adults > 65 years, both sexes, use of polysomnography or validated questionnaires for RLS and risk of falling. Exclusion criteria: cards; abstracts; congress proceedings, posters.

Results: Of the 321 articles identified, 05 were selected and analyzed, with the observations: 10% of the total participants had RLS, and most were females. Women were 2.46 times more likely to develop RLS than men. In addition, elderly people with RLS had a relative risk of falls of 6.59. This condition may have occurred due to the following factors: 1. Individuals with scores above 5 points on the Pittsburgh Sleep Quality Index were more frequent in those with RLS than in those without it; 2. RLS was associated with worse physical functioning, since these elderly patients reported difficulties in performing daily life activities, such as climbing stairs, getting up from chairs, bending over and moving large objects; so that mobility limitations were statistically and clinically significant (hazard ratio of 1.90), implying higher accidental risks in the elderly and showing a prevalence ratio of elderly with RLS who fell 2.63 times higher than those who did not have RLS; 3. The Mini-Mental score was lower in patients with RLS than in individuals without it, demonstrating concentration problems in this population and, hence, higher numbers of falls; 4. An association was observed between nocturnal falls and patients with RLS who used benzodiazepines.

Conclusions: The present systematic review showed an association between Restless Legs Syndrome and an increased risk of falls in the elderly. However, this association may depend on RLS manifestations and related behaviors, namely, poor sleep quality, physical deconditioning, difficulties in concentration, and consumption of benzodiazepines.

ID: 1415

Development and Validation of an Application for Prevention of Sleep Disorders in Puerperal Women

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Keywords

- ▶ sleep deprivation
- ▶ health education
- ▶ postpartum period
- ▶ educational technology
- ▶ validation studies

Introduction: Sleep deprivation and sleep fragmentation are considered frequent causes of sleep disorders in the puerperal stage. Although it is considered a transitory stage, with no defined date for return to normal sleep, the puerperal woman may have cumulative sleep disturbances. Therefore, it is important to develop self-learning strategies to minimize the negative consequences of sleep deprivation in the postpartum period.

Aim: This study describes the process of developing and validating a free self-learning application for preventing sleep disorders in postpartum women.

Methods: Methodological research in three stages: literature review, construction of the application and validation of the application. For the construction of the educational media a literature review was performed and software development kits (SDK) for Android devices were used through the co-design methodology adapted from Millard. Content Validation Index (CVI) was used for content and appearance validation by experts with experience in Human Chronobiology and a minimum master's degree. The usability evaluation was performed by the target audience formed by puerperal women, through the System Usability Scale (SUS) questionnaire and a minimum score of 68 points.

Results: The application was completed with 19 screens involved importance of good quality sleep, sleep in the postpartum period, adequate sleep in the puerperium and strategies for improving sleep domains. The content and appearance validation of the app program was performed by five experts with experience in chronobiology research and/or teaching, and most of them with a doctoral degree. This validation stage obtained a minimum CVI of 0.80. The usability evaluation was performed by a group of thirty-six puerperal women, with a prevalence of normal births, complete secondary education and multiparous. The SUS score obtained was 78.8 points.

Conclusions: The "Sono no pós-parto" application obtained satisfactory content validation and appearance. The usability evaluation obtained a score considered good. Thus, the application can be considered a suitable tool for use in teaching-learning on subjects related to sleep in the puerperium. It is expected that the application can be reformulated to attend other women profiles.

ID: 1417

Validation Study of a Quality of Life Questionnaire (SAQLI) and the Comparison of Anxiety and Depression in the Population before and after the Covid-19 Pandemic

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Keywords

- ▶ COVID-19
- ▶ anxiety
- ▶ depression
- ▶ quality of life questionnaire

Introduction: During the study of the validation of the quality of life questionnaire (SAQLI), it was necessary to carry out the selection of samples using the Beck anxiety and depression scales. The study started in August 2021, was interrupted in March 2020 and the return to its application was in March 2022, with a clear finding that anxiety and depression have increased considerably, influencing adherence to treatments for sleep disorders.

Aim: The initial objective was to validate the quality of life questionnaire (SAQLI), however, after restarting the application of the anxiety and depression scales, it was possible to observe a considerable increase in these indices, leading to the current study comparing these indices before and after critical period of the pandemic.

Methods: This study started at Unifesp's neuro-sleep outpatient clinic in August 2021 and is ongoing at Unicamp's snoring and apnea otorhinolaryngology outpatient clinic. The cut-off point for excluding patients from the questionnaire validation study was from 12 points, in the Beck Inventory for depression and for the Anxiety Inventory the cut-off point was 19 points.

Results: Before the pandemic period, from August to November 2021, 8 patients from the Unifesp neuro-sleep outpatient clinic participated, with only 2 participants being excluded from the study, that is, 25% of exclusion, for scoring above the aforementioned cutoff points. After the period of isolation caused by the pandemic, studies were resumed at the otorhinolaryngology outpatient clinic at Unicamp and 6 patients participated between March and August 2022, and the proportion of exclusion increased significantly because, by taking the same cuts, it would only be possible to select 2 patients, 67% exclusion.

Conclusions: Quantitative analysis reveals a significantly higher rate of depression and anxiety in the population after the critical period of the pandemic. However, there is a qualitative caveat that reveals that this increase may be associated with the disclosure of symptoms of anxiety and depression caused by social isolation, changes in routines influencing sleep quality, exacerbating these symptoms. However, there are new findings pointing to emotional sequelae related to covid-19. These studies reveal that patients who would have a predisposition to anxiety and/or depression experienced these emotional symptoms, in a large way, after 3 months of the onset of covid-19 symptoms.

ID: 1418

Does Insomnia Associate to the Risk of Falling in Elderly? A Systematic Review

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Keywords

- insomnia
- falls
- elderly

Introduction: According to the World Health Organization, 30% of aged (> 65 years old) people and 50% of those above 80 years old, report falling at least once a year. Yet, prevalence of poor sleep quality among aged population varies from 33% to 73%, with insomnia prevailing on 13% to 30% of the same age-group. Insomnia is related to excessive daytime sleepiness, worse physical and cognitive function, difficult concentration, and slower motor reflexes response rates, contributing to an increased risk of falling.

Aim: To evaluate the association between insomnia and the risk of falling in elderly (people aged 65 years and older).

Methods: This is a systematic review (PRISMA 2020). For the research strategy, the descriptors "insomnia", "falls", and "elderly" were used. Inclusion criteria: cross-sectional and longitudinal studies; elderly aged >65 years, of both

sexes; studies that involved older people diagnosed with insomnia and the evaluation of the occurrence of falls in this population. Exclusion criteria: studies involving animals; reviews; letters; abstracts; congress proceedings.

Results: A total of 4.574 articles were found in the electronic databases and manual research. Nine studies were selected according to the eligibility criteria, with the following results: 1. Insomnia and its symptoms were associated with an increased risk of falling. 2. Older people with insomnia have 78.7% more risk of falling (RR = 1.787, 95% CI = 1.106-2.887) than those without such disturbance. 3. The use of benzodiazepines in patients without insomnia and as an insomnia treatment were independently associated with an increased risk of falls in the older population by 27% (OR 1.27 [1.08-1.49]) and 54% (OR 1.54 [1.21-1.97]), respectively. 4. Insomnia symptoms, such as difficulty falling asleep and difficulty staying asleep throughout the night, were related to the increased number of falls, respectively 53% (OR 1.53 95% CI = 1.04-2.24) and 64% (OR 1.64 95% CI = 1.11-2.42).

Conclusions: Results from this study relying on a systematic review indicate insomnia as a risk factor of falling among elderly. Further, benzodiazepines may also independently contribute to such risk. These results have significant clinical relevance both for diagnosis and therapeutic.

ID: 1419

Effective Treatment with Mandibular Advancement Devices in Comorbid Insomnia and Sleep Apnea: A Two Step Study on Clinical, Polysomnographic, and Cardiovascular Risk

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Keywords

- COMISA
- sleep apnea
- insomnia
- oral appliance
- autonomic balance

Introduction: One of the options for COMISA treatment is CPAP, which can fail. It is known that the mandibular advancement oral appliance (OAm) has efficacy and adherence in the treatment of OSA, however it has never been tested in COMISA patients.

Aim: To test whether OAm may be successful for treating COMISA patients both regarding respiratory parameters and insomnia and related cardiovascular risk.

Methods: Two independently cohorts were addressed for testing: 1) whether OAm may improve OSA and insomnia in patients with COMISA; 2) whether OAm may improve cardiovascular risk in patients with COMISA. Cohort 1: patients with isolated Obstructive Sleep Apnea (OSA) ($n = 35$; 51,4% males) and COMISA as defined by OSA + Sleep Latency > 30min ($n = 31$; 58,1% males) derived from 3 different centers (Portugal, Spain and Brazil) were treated with OAm; Cohort 2: patients with COMISA, as defined by OSA + Sleep Latency > 30min ($n = 12$), were treated with titratable

PMPositioner (OAm) and evaluated after 3 months of using OAm. Sleep variables were evaluated by PSG and Heart rate variability (HRV) as a surrogate of cardiac autonomic function was accessed and analyzed by rhythmography, which stands on the HRV wave structure as a fingerprint of autonomic regulatory mechanism.

Results: Cohort 1: OSA and COMISA groups didn't differ neither regarding age (50.8 ± 12.1 vs 54.8 ± 8.1 ; $p = 0.12$) and pre-treatment Apnea Hypopnea Index - AHI ($26.9 \text{ ev/h} \pm 14.4$ vs $25.2 \text{ ev/h} \pm 10.6$; $p = 0.6$). Post-treatment AHI remained slightly higher and above the normal threshold in COMISA group ($6.4 \text{ ev/h} \pm 6.9$) while achieving normal levels ($<5/h$) in OSA group ($3.7 \text{ ev/h} \pm 3.2$); $p = 0.04$. Sleep latency significantly improved from 63.6 ± 46 minute to 22.8 ± 20.8 minute; $p = 0.001$ in COMISA group without changes in OSA group; Cohort 2: COMISA patients (6 males), mean age = 49.7. The AHI was reduced from 22.7 ± 12.7 to 4.0 ± 3.5 ($p < 0.0002$) and sleep latency reduced from 63.1 ± 49.4 to 21.8 ± 21.4 ($p < 0.2$), reaching a normal level. The time-domain and frequency-domain parameters were significant for RR interval (from 807 ± 30 to 936 ± 62) and both Fast Fourier Transform (FFT) in parasympathetic area and Wavelet analysis spectral method (WVT) for sympathetic area, respectively.

Conclusions: OAm can be an effective tool for managing COMISA patients, with significant positive impact on respiratory and insomnia related therapeutic outcomes as well on the reduction of cardiovascular risk, as showed by the positive impact on the autonomic balance.

ID: 1422

Correlation between Objective and Subjective Measures of the Sleep Parameters in Post-COVID-19 Patients

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Keywords

- ▶ COVID-19
- ▶ excessive daytime sleepiness
- ▶ sleep quality
- ▶ sleep parameters

Introduction: SARS-CoV2 infection has a serious pandemic character and high potential for transmission around the world. This disease has been generating repercussions in affected patients even in the post-COVID phase. Changes in the sleep parameters are highly prevalent and can affect the functional capacity and quality of life of these patients. Thus, it is important to evaluate and monitor sleep-related variables in the post-covid period.

Aim: To assess the correlation between objective and subjective measures of sleep parameters in post-COVID-19 patients.

Methods: This is a cross-sectional study and the objective assessments of sleep included sleep efficiency (SE), total sleep time (TST), Wake episodes per night (WE) and sleep latency (SL), obtained by the Actigraph (ActTrust, Condor) used for 7 days. The subjective sleep quality (SQ) was assessed using the Pittsburgh sleep quality questionnaire (PSQI) and the excessive daytime sleepiness (EDS) using the Epworth sleepiness scale (ESS). Data are shown as mean, standard deviation and percentage. The Spearman correlation test was used to evaluate the correlation between the

variables, a statistical significance level of $p \leq 0.05$ was considered.

Results: Fifteen patients were evaluated, aged 44.8 ± 14.4 years, and the prevalence of females (83.3%). Regarding to the PSQI results, poor sleep quality was observed in the entire sample (100%). However, the subjects did not show EDS. Correlating objective and subjective measures of sleep parameters, a positive correlation was observed between the PSQI score and TST ($p = 0.018$; $r = 0.60$). There was no correlation between PSQI score and SL ($p = 0.37$; $r = 0.17$), SE ($p = 0.67$; $r = -0.11$) and WE ($p = 0.92$; $r = 0.27$). There was also no correlation between ESS score and TTS ($p = 0.77$; $r = 0.08$), LS ($p = 0.28$; $r = 0.29$), ES ($p = 0.81$; $r = -0.06$) and the ND ($p = 0.30$; $r = 0.28$).

Conclusions: In accord to the results, a positive correlation was observed between sleep quality (PSQI score) and total sleep time. However, there was no correlation between the PSQI and ESS scores and the other objective sleep parameters.

ID: 1424

Influence of Social Jet Lag on Food Consumption during the First Year of Bariatric Surgery

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Keywords

- ▶ social jet lag
- ▶ bariatric surgery
- ▶ food consumption

Introduction: Circadian misalignment is caused by a failure to synchronize endogenous (central and peripheral clocks) and environmental factors. Social jet lag (SJL) is a measure that indicates the degree of this misalignment and is related to a higher risk of obesity, changes in metabolic parameters and worse eating patterns. However, the scientific literature is still lacking in studies on the influence of SJL on food consumption in individuals undergoing bariatric surgery.

Aim: Evaluate the influence of SJL on food consumption during the first year of bariatric surgery.

Methods: The study included 122 bariatric patients (83.3% female; 33 years old [28-41.7]), 80% of who underwent Gastric Bypass-Y-ROUX. The food consumption was evaluated by two 24-hour recalls (24HR) (1 day during the week and 1 day on the weekend) at each evaluation moment (baseline, three months, six months and one year after bariatric surgery) and the multiple pass method was used. Linear regression was performed to analyze the association between the mean SJL and macronutrient and fiber consumption over 1 year of surgery follow-up. The generalized estimating equations (GEE) was performed to evaluate the effect of time, the isolated effect of SJL, and the interaction between time and SJL throughout the same period of one year. The following adjustments we used in the statistical analysis: sex, age, surgical technique, family income, physical activity, marital status, physical exercise and body mass index (BMI), diabetes, and shift work.

Results: Linear regression results showed that the greater exposure to SJL, the higher consumption of calories ($p = 0.01$) and protein ($p = 0.03$) after 1 year of surgery. Furthermore, the GEE results showed that the group more exposed to SJL had the higher consumption of calories ($p = 0.001$), carbohydrates ($p = 0.003$), proteins ($p = 0.001$),

total fat ($p = 0.002$) and polyunsaturated fat ($p = 0.011$) when compared with the group less exposed to SJL during the first year of recovery.

Conclusions: SJL was negatively associated with consumption of calories, carbohydrates, proteins, total fats and polyunsaturated fats during the first year after bariatric surgery. However, more studies are needed on this topic to better understand these results in individuals undergoing this surgical intervention.

ID: 1425

Assessment of Sleep Quality and Associated Factors in Physical Education Students during the Remote Model

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Keywords

- ▶ physical education
- ▶ sleep
- ▶ student health
- ▶ sleep-wake disorders
- ▶ sleep disorders due to excessive sleepiness

Introduction: With the COVID-19 pandemic, sleep disorders were intensified and during the period of quarantine, there was a drop in the physical and mental well-being of human beings, and this condition is related to the decrease in sleep quality, causing capacity of impaired health restoration, resulting from the presence of some pre-installed disease, demanding a greater amount in the hours of sleep. Therefore, it is important to investigate whether in fact the sleep quality of Physical Education students at a Public University in the Northern Region of Brazil is reduced due to the inclusion of remote classes.

Aim: to evaluate the sleep quality of Physical Education students during the remote model.

Methods: Cross-sectional study with non-probabilistic sampling. Participants were asked to respond to the Pittsburgh Sleep Quality Index, validated for use in Brazil. This project was approved by the Ethics and Research Committee through opinion No. 5,117,581. Data were analyzed using the Statistical Package for Social Sciences software.

Results: Of the 68 students studied, it was found that 50 (73.5%) had poor sleep quality/sleep disorders, 24 (35.3%) were male and 26 (38.2%) were female, with no significant difference between groups. As for the average age of the two groups, in the group with good sleep quality it was 25.5 (± 6.58) years, and with poor sleep quality/sleep disorders it was 24.78 (± 5.89) years. Regarding the number of children in the studied sample, 41 (82.0%) of those who did not have children had poor sleep quality/sleep disorders, with a significant difference between the two groups ($p = 0.02$). It is observed that 22 (44.0%) of the students participating in the third year of the course had poor sleep quality/sleep disorders. It is worth highlighting an important data regarding fourth year students, in which 9 (50.0%) demonstrated good sleep quality.

Conclusions: Students seem to be more exposed to poor sleep quality/sleep disorder, with those in the 5th and 6th period being the most affected and presenting a worse perception of sleep quality. Non-pharmacological interventions should be implemented to improve the sleep hygiene of these students.

ID: 1426

Food Insecurity Associated with Evening Types: Cross-sectional Study with University Students during the COVID-19 Pandemic

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Keywords

- ▶ university students
- ▶ food security
- ▶ sleep hygiene

Introduction: The chronotype, which reflects the interindividual differences in sleep patterns and sleep wake-cycles and activities, is linked to well-being and preference for morning and evening. Individuals, especially university students, with a tendency to evening, have been investigated because they are more prone to sleep disorders and physiological and cognitive changes due to academic demands and social life. In addition, the social restriction caused by COVID-19 pandemic altered the student's lifestyle and deteriorated the situation of food insecurity, contributing to an increase in the development of social inequities and evasion. Concerns about uncertainties regarding socioeconomic conditions and health contributed substantially to the worsening of sleep patterns and food of these individuals. However, knowledge is limited about the relationship between chronotype and food security.

Aim: To estimate the prevalence of food insecurity, to know the chronotype of university students and their association in the pandemic period.

Methods: Cross-sectional study at a federal university located in the Midwest region of Brazil. An instrument for sociodemographic characterization was applied, the Morningness and Eveningness Questionnaire by Horne and Österberg was used, evening chronotypic trends were considered scores between 16-41 points, and Brazilian Food Insecurity Scale (EBIA), scores between 1-8 points were considered food insecurity.

Results: This study included 138 students. The prevalence of food insecurity was 49.3% and of university students with a tendency to evening 50.7%, who had a 2.46 times higher chance of food insecurity (95% CI 1.02-5.50, $p = 0.04$). It is concluded that the university students are in greater vulnerability to food insecurity.

Conclusions: The findings reveal the need to develop actions aimed at sleep hygiene and adequate and low-cost feeding strategies for this vulnerable population.

ID: 1427

Sleep Bruxism Frequency Related to Hormonal Changes: A Cross-sectional Assessment in Women from a Population Sample from São Paulo (Brazil)

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Keywords

- ▶ sleep bruxism
- ▶ hormones
- ▶ menopause
- ▶ women

Introduction: Sleep patterns change throughout life among women, because of both aging and hormonal oscillations. These hormonal changes have a marked influence on the menopausal transition, increasing the complaints of postmenopausal sleep disorders. Sleep bruxism (SB) affects a large portion of the general population, but its etiology remains unknown. Previous studies indicate that gender and hormonal changes might affect the incidence of SB. It is important to evaluate the effect of hormones changes on the prevalence of bruxism.

Aim: The aim of this study was to evaluate whether the prevalence of SB was different due to the menopausal status, comparing premenopausal and postmenopausal women.

Methods: This study was based on the database of the São Paulo Sleep Epidemiological Study (EPISONO), 3rd edition, a population-based cross-sectional study conducted in São Paulo in 2007. Participants (20–80 years old) undergone a full-night type-I polysomnography and answered both a sleep and a gynecological questionnaire. Diagnostic of bruxism was made in 2 steps: individuals who have self-reported SB had their polysomnographies evaluated for bruxism, based on electromyographic recordings of the masseter muscles. In the morning after the polysomnography, blood was collected to assess serum levels of LH, FSH, progesterone and 17-estradiol, which were used to distribute women into groups according to stage of life: reproductive age (premenopausal) or postmenopausal.

Results: The sample of the EPISONO study comprised 1,042, including 535 women. After hormonal analysis, 339 women were considered as premenopausal and 196 as postmenopausal. A total of 32 women were diagnosed with SB, being 11 in the premenopausal group and 21 in the postmenopausal group. The prevalence of SB in postmenopausal group was 10.7% and the prevalence in the premenopausal group was 3.2%. The prevalence ratio of SB was estimated as 3.3.

Conclusions: We observed that postmenopausal women have 3 times more chance to be diagnosed with SB when compared with women of reproductive age. These findings suggest that the prevalence of SB should be analyzed in the face of hormonal changes present in these different phases of women's lives. Therefore, the menopausal transition and the postmenopausal period should be considered as a period of risk for the incidence of SB.

ID: 1428

Alcohol Use and Sleep in Women: Results of a Cross-sectional Survey

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Keywords

- ▶ sleep
- ▶ alcohol use
- ▶ woman
- ▶ sleepiness

Introduction: Women of reproductive age present specific sleep characteristics when compared with men, including a higher prevalence of insomnia, sleep dissatisfaction and more sleep complaints. Alcohol use and abuse, which has increased among women in the last decades, might worsen these sleep-related symptoms.

Aim: This study aimed to evaluate effects of alcohol use on sleep characteristics on a sample of women of reproductive age.

Methods: The original sample comprised 2,055 women of reproductive age, from 18 to 40 years, who responded to an online questionnaire between 2016 and 2017. Excessive daytime sleepiness (EDS) was analyzed using with the Epworth Sleepiness Scale (ESS) and insomnia symptoms were evaluated with the Insomnia Severity Index (ISI). Sleep Efficiency (SE) was calculated using self-reported bedtime, awakening time and total sleep time (TST). Alcohol use was assessed according to the self-reported use pattern in the last 3 months. The effects of alcohol use on ISI and ESS score, TST and SE were analyzed using Linear Regression Models and significance level was established as $p < 0.05$.

Results: Daily or almost daily alcohol use was associated with reduced SE ($B = -0.63 [-1.14; 0.11]$, $p < 0.05$). Drinking 5 or more doses in a single occasion was associated with increased EDS ($B = 0.14 [0; 0.27]$, $p < 0.05$). Drinking 5 or more doses in a weekly basis was associated with increase of TTS ($B = 0.24 [0.04; 0.24]$, $p < 0.05$), however, no significant difference was found in SE in this group ($B = -0.09 [-0.29; 0.12]$, $p > 0.05$).

Conclusions: Based on this online survey, we found a significant relationship between worse sleep pattern and alcohol use among women of reproductive age, mainly including reduced SE and increased EDS.

Support: AFIP, CNPq, and CAPES.

ID: 1429

Food Practices and Sleep Quality of University Students during COVID-19 Pandemic: A Cross-sectional Study Carried Out in Midwest of Brazil

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Keywords

- ▶ University students
- ▶ eating behavior
- ▶ sleep hygiene

Introduction: Concerns about uncertainties regarding academic and health conditions contributed substantially to the worsening of sleep pattern and nutrition of university students during social isolation due COVID-19 pandemic. Although poor sleep quality is extremely prevalent during the COVID-19 pandemic, little is known about the qualitative assessment of diet under pandemic conditions in this population. The few studies performed have quantified food consumption.

Aim: To estimate the prevalence and association of poor sleep quality and food practices of university students during the COVID-19 pandemic.

Methods: Cross-sectional study, at a federal university located in the Midwest region of Brazil. This research belongs to the matrix project entitled "mental health, nutritional care and sleep pattern of the university community during the covid-19 pandemic: mixed research," approved by the National Council for Ethics in Research (CONEP), nº 4.084.201, complying with the requirements of Resolution nº 466/2012. To assess sleep quality, the Pittsburgh Sleep Quality Index (PSQI) was used (> 5 points – poor sleep quality) and eating behavior was qualitatively evaluated by the food practices test developed by the Ministry of Health based on the

recommendations of food guide and validated for the Brazilian population. It was considered >41 points: protective to health, deserves attention: between >31 <41 points: <31 points: needs change.

Results: 253 students participated in the study. It was found that 40.3% ($n=102$) students had eating habits that needed changes and with a 2.45 times chance (95% CI 1.68-3.58; $p<0.00$) of poor sleep quality (62.8%, $n=159$) in relation to those who had good sleep quality.

Conclusions: University students with unhealthy food practices are more likely to have impaired sleep quality. The results demonstrate the need for actions aimed at preventing health problems in this vulnerable population.

ID: 1430

Sleep Quality and Mental Health of University Students during the COVID-19 Pandemic

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Keywords

- ▶ University students
- ▶ mental health
- ▶ sleep hygiene

Introduction: University students are considered vulnerable to different situations, due to multiple factors, such as increased levels of stress, depression and anxiety, triggered by graduation demands and difficulty in reconciling them with other responsibilities. During the suspension of presential classes, as a protective measure against the spread of COVID-19, these symptoms were intensified, reflecting negatively on sleep quality and mental health.

Aim: To estimate the prevalence and association of poor sleep quality and mental health in university students during the COVID-19 pandemic.

Methods: Cross-sectional study, at a federal university located in the Midwest region of Brazil. An instrument for sociodemographic characterization, a questionnaire for screening for common mental disorders (SRQ-20) and Pittsburgh Sleep Quality Index (PSQI), instruments validated for Brazilian population were applied.

Results: 253 students participated in the study. The prevalence of poor sleep quality was 62.8% ($n=159$) and common mental disorder 58.1% ($n=147$), which were 3.95 times more likely to have poor sleep quality (95% CI 2.30-6.80, $p<0.00$).

Conclusions: Students with common mental disorder were more prone to poor sleep quality. The results demonstrate their vulnerabilities, a fact that points to the need for interventions regarding sleep hygiene, aiming at the integral health of these individuals.

ID: 1431

Is Poor Sleep Quality Associated with Falls in Community-dwelling Older Adults?

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Keywords

- ▶ sleep
- ▶ senior
- ▶ falls

Introduction: Populations are aging due to increased life expectancy, thereby generating challenges for health systems. Falls have serious consequences for the physical and mental health of older adults. Some studies have examined the risk factors related to falls, but few have investigated poor sleep quality as a risk factor.

Aim: To determine whether poor sleep quality in community-dwelling older adults was a risk factor for falls.

Methods: A total of 513 older adults were recruited through household interviews in the city of Presidente Prudente in the State of Sao Paulo, Brazil. The participants completed questionnaires about sleep quality (the Pittsburgh Sleep Quality Index), and answered questions about their history of falls (Have you fallen in the last year? Have you fallen since you became 60 years old?).

Results: The findings demonstrated that 324 (63%) had fallen after becoming 60 years old and 183 (35.6%) had fallen in the last year. Sleep quality showed to be a risk factors for falls with an odds = 1.12 (95% confidence interval: 1.05 to 1.19) adjusted for age, body mass index and sex.

Conclusions: The results were consistent in indicating that sleep quality was associated with falls in older community-dwelling adults. Health professionals should be aware of this association and implement measures to assess and improve the sleep quality of older adults.

ID: 1432

Relationship between Sleep Disorders, Depression, and Obesity in Older Adults with or without Sarcopenia

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Keywords

- ▶ sleep
- ▶ elderly
- ▶ depression
- ▶ sarcopenia

Introduction: During the aging process, a series of changes occur in the body, generating a greater chance of older adults developing obesity, poor sleep sarcopenia, and emotional disorders, which are associated with decreased mobility an increase in a range of diseases, especially chronic ones.

Aim: To identify the association between sleep disorders, depression and obesity in sarcopenic and non-sarcopenic older adults.

Methods: The study was cross-sectional, with data collection performed by the Study Group on Physical Education, Physiotherapy, Sport, Nutrition and Performance (GEF-FEND/UNICESUMAR), which involves professionals from various areas whose aim was to provide an interdisciplinary approach to therapy for individuals with obesity or overweight. Individuals over 60 years old and insufficiently active were included, and they completed three sleep assessments – the Pittsburgh, Berlin, and Epworth instruments. In addition, they underwent a bioelectrical impedance assessment of

body composition and dynamometry to evaluate isometric manual strength; and completed the Patient Health Questionnaire-9 for depression, and the Strength, Assistance with Walking, rising from a chair, climbing stairs, and falls (SARC-F) questionnaire to assess the possible presence of sarcopenia. For statistical analysis, the chi-square test was used to verify the association of categorical variables.

Results: A total of 77 older adults were recruited. Among the 77 participants, 67 were not diagnosed with sarcopenia and 10 were diagnosed with sarcopenia. The results demonstrated an association between sarcopenia and the volunteers' BMI ($X^2=16.21$ $p=0.001$). However, no significant relationship was found between sarcopenia and depressive symptoms ($X^2=2.74$ $p=0.601$). Regarding sleep variables, there was no association between of the Pittsburgh, Berlin and Epworth instruments and the diagnosis of sarcopenia ($X^2=2.02$ $p=0.154$; $X^2=1.33$ $p=0.513$; $X^2=0.239$ $p=0.625$), respectively.

Conclusions: Our study findings indicated that a higher BMI was associated with sarcopenia in older adults. Although we did not obtain significant results for depression and sleep quality, both variables deserve further investigation, as our sample was small, and this was a limitation of the study.

ID: 1433

Sleep and Eating Behavior in Adults: A Pilot Study

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Keywords

- ▶ sleep
- ▶ eating behavior
- ▶ weigh gain
- ▶ actigraphy

Introduction: Sleep duration and quality have been associated with eating behaviors. Short sleep duration and worse sleep quality are associated to weight gain through worsening eating habits as increased intake of high energy density and reduced in natura food groups. Specific eating behaviors as uncontrolled eating (UE), emotional eating (EE) and, cognitive restrain (CR) might be also influenced by sleep quality and then contribute to eating pattern.

Aim: To identify specific eating behaviors related to sleep pattern in adults.

Methods: This is a transversal design pilot study developed with nine adult participants (5 female). It was evaluated Sleep-awake cycle by 14 days of actigraphy, sleep quality by Pittsburg Sleep Quality Index (PSQI) and, eating behavior by the Three-factor Eating Questionnaire (TFEQ-21). Also body weight and composition were evaluated using bioelectrical impedance. This study was approved by Human Ethical Comitee (protocol: 3.164.884) from Federal University of Lavras, Brazil. Analysis was performed comparing groups distributed by: total sleep time (TST: < 7h/night or > 7h/night), time of sleep (below 23:00h and after 23:00h), and sleep quality (Good: PSQI < 5 and Bad: PSQI ≥ 5). Pearson correlations between variables was performed. Jamovi software (2.3.16 version) was used for analysis and significance level of 5% was adopted.

Results: Mean age of participants was 31.0 ± 9.43 years and, mean BMI was 25.0 ± 3.53kg/m². Participants

who slept after 23:00h showed increased score for CR (61.1 ± 15.7; $p=0.007$) compared with those who slept before 23:00h (24.1 ± 8.48). Also, participants with less than 7h of sleep showed increased score for UE (37.0 ± 6.3; $p=0.031$) compared with those with higher than 7h of total sleep time (25.0 ± 6.32). No significant differences between eating behaviors and PSQI groups were found. Negative correlation between UE and TST ($r=-0.711$; $p=0.032$) and a positive association between the interval of the time of the last meal of the day and time of sleep ($r=0.684$; $p=0.042$) were found.

Conclusions: This pilot study suggests that sleep late might be related to increase CR and, lower sleep duration is associated to increase UE. These relationships might contribute to increase energy intake and weight gain in adult population.

ID: 1434

Effects of CPAP on Central and Peripheral Blood Pressure in Patients with Uncontrolled Hypertension and Obstructive Sleep Apnea: Final Analysis of the Multicenter MORPHEOS Trial

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Keywords

- ▶ hypertension
- ▶ obstructive sleep apnea
- ▶ continuous positive airway pressure

Introduction: The impact of obstructive sleep apnea (OSA) treatment with continuous positive airway pressure (CPAP) on central and peripheral blood pressure (BP) is not well established in patients with uncontrolled hypertension (HTN).

Aim: Evaluate the impact of OSA treatment with CPAP on central BP, office BP and 24 hours ambulatory BP monitoring (ABPM).

Methods: The MORPHEOS is a multicenter ($n=6$) randomized controlled trial designed to evaluate the BP lowering effects of treatment with CPAP or placebo nasal dilator strips (NDS) for 6-months in adult patients with uncontrolled HTN and moderate-to-severe OSA. Patients using at least one anti-hypertensive medication (AHM) were included. Uncontrolled HTN was confirmed by at least one abnormal parameter in the 24 hours ABPM and ≥ 80% medication adherence evaluated by pill counting after the run-in period (4 weeks). OSA was defined by an apnea-hypopnea index ≥ 15/h. The co-primary endpoints are brachial BP (office and ABPM) and central BP. Secondary outcomes include hypertension-mediated organ damage. Visits occur once a week in the first month and once a month thereafter.

Results: One-hundred fourth-five patients with uncontrolled hypertension (median 3 [1.8;4.0] AHM, baseline values of office systolic and diastolic BP: 153 ± 17 and 93 ± 12 mmHg, respectively), and OSA were randomized to NDS ($n=72$) and CPAP group ($n=73$). Due to COVID-19 pandemic and refusals to repeat exams, 22 randomized patients did not complete the study. Baseline clinical and polysomnographic variables were similar between the groups. Compared with NDS, CPAP promoted a greater reduction in SBP and DBP at 6 months (Δ Delta SBP: DNS -4 ± 17 versus CPAP -10 ± 16 mmHg, $p=0.027$; Δ DBP: NDS -1.27 ± 10 versus CPAP -7 ± 12 mmHg, $p=0.004$). Regarding central BP, CPAP promoted a greater reduction in central SBP and DBP but did reach statistical significance at 6 months only for DBP (Δ central SBP: NDS -6 ± 19 versus CPAP -10 ± 17 mmHg, $p=0.09$; Δ central DBP: DNS -3 ± 13 versus CPAP -6 ± 9 mmHg, $p=0.006$). 24 hours ABPM analysis revealed no differences in BP for the comparisons of NDS and CPAP, but CPAP reduced nighttime heart rate as compared with NDS.

Conclusions: In patients with uncontrolled HTN and OSA under regular AHM, CPAP was effective in reducing office SBP, DBP and central DBP but have no significant effects on ABPM parameters as compared with placebo.

ID: 1435

Thirty Minutes of Physical Exercise May Contribute to the Maintenance of Total Sleep Time in Shift Workers

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Keywords

- ▶ shift workers
- ▶ physical exercise
- ▶ sleep

Introduction: Shift workers may have chronic sleep restriction, reducing sleep duration to an average of 5 and 6 hours per day (Narciso; Teixeira; Ohayon; Smolensky; Roth, 2010), presence of sleep disorders, physical complaints and fatigue (Moreno; Lowden; Vasconcelos; Marqueze, 2016) that compromise worker health and safety (Mello; Narciso; Mello; Ruiz, 2015). Workers on the night shift or on rotating shifts mostly have chronic sleep restriction and are usually involved in activities that make routine and regular physical exercise difficult, which can have positive effects on sleep. Physical exercise can still be considered a zeitgeber capable of stimulating specific effects on circadian rhythms and the central molecular clock machinery (Kemler; Wolff; Esser, 2020).

Aim: The aim of this study was to investigate the effect of 30 minutes of physical exercise with vibration on the sleep of shift workers.

Methods: This study was approved (protocol No. 97394818.6.0000.5149) by the Research Ethics Committee (COEP) of the Federal University of Minas Gerais. Participated in the research, 23 male volunteers, aged between 18 and 50 years old, fast rotating shift workers 4×1 off-road truck operators in mining company. Participants' sleep was assessed by the actigraphy method for 15 days. Then the participants were randomly allocated to the exercise group on an oscillating platform or the control group. The intervention phase consisted of performing three physical exercise sessions per week, lasting ~30 minutes per session. After the intervention or control period, the volunteers had their sleep

evaluated by the actimetry method for another 15 days. The generalized linear model (GEE) with Gamma distribution was applied to describe the effect of group and time on measures of sleep assessed by actigraphy. The variables group and time were considered as a fixed effect, controlling for age and the length of time working on the scale.

Results: Only the variable of total sleep time showed a significant result (Wald Chi-Square 7.59, degrees of freedom:3, $p=0.05$). A reduction of ~32 units was observed in the overall mean of the control group at post-treatment compared with pre-treatment.

Conclusions: The proposed physical exercise did not improve sleep parameters evaluated by actigraphy in shift workers. However, those who did not exercise reduced their total sleep time. Physical exercise can help to maintain sleep behavior and total sleep time in shift workers.

ID: 1436

Profile of Patients with COMISA from a Private Clinic in São Paulo

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Keywords

- ▶ COMISA
- ▶ OSA
- ▶ insomnia

Introduction: Insomnia is the most common sleep disorder followed by obstructive sleep apnea. Both constitute a public health problem in isolation due to the impact on the individual's health, as well as the increase in health costs. The comorbidity of insomnia and OSA (COMISA) is even more challenging and still underexplored.

Aim: Map the profile of patients with COMISA treated at a private clinic in São Paulo city.

Methods: Between March and June 2022, all patients who attended the clinic were invited to answer the Insomnia Severity Index (ISI) questionnaire. The questionnaire was sent via a link to the patient's cell phone and the result was stored in a database, attached to the patient's medical record and a copy sent to their email. To assess the severity of OSA, we used the AHI taken from the previous polysomnography result. About the use of medication, patients were asked about and registered in their medical records. When analyzing the medications, we separated them into 4 classes: Z drugs, benzodiazepines, antidepressants, and others (anticonvulsants, cannabidiol and analgesics).

Results: A total of 317 patients were invited to answer the questionnaire, 10 of which did not have a cell phone and/or were unable to respond, 6 refused to complete the survey and 300 responded to the questionnaire. Our sample consisted of 209 (69.66%) male patients and 91 (30.33%) aged between 25 and 89 years (mean: 59.96), the mean age among women was 65.59 and men 57.51. When assessing the severity of OSA, our population consisted of 150 (50%) patients severe OSA, 67 (22.33) moderate OSA, 20 (6.66%) with mild OSA and 63 (21%) who did not bring baseline polysomnography, only titration or medical prescription for CPAP use. As a result of the ISI, we found 91 (30.33%) of the patients did not present clinically relevant symptoms of insomnia, but 53 used some type of medication, 116 (38.66%) were classified as mild insomnia and 44 of them used medication, 79 (26.33) were classified as moderate

insomnia and 37 of them used medication and 14 were considered to have severe insomnia and 5 of them used medication. All women in the study were classified as without insomnia because they did not present clinically significant symptoms, but 64 (70.32%) of them were using medication. As for the use of medication, only 81 men (38.75%) reported using it.

Conclusions: COMISA was very prevalent (69.66%) in our population measured by symptoms and may be more frequent as many were already using medication.

ID: 1437

Impact of Obstructive Sleep Apnea Treatment with Continuous Positive Airway Pressure on Arterial Stiffness in Patients with Uncontrolled Hypertension: A Randomized Clinical Trial

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Keywords

- ▶ arterial stiffness
- ▶ carotid arterial thickness
- ▶ hypertension
- ▶ obstructive sleep apnea
- ▶ continuous positive airway pressure

Introduction: Obstructive sleep apnea (OSA) is common in patients with hypertension (HTN) and may induce target-organ damage. Arterial stiffness is independently associated with cardiovascular risk. However, the impact of OSA treatment with continuous positive airway pressure (CPAP) on arterial stiffness in patients with OSA and HTN is unclear.

Aim: To evaluate the impact of OSA treatment with CPAP on arterial stiffness and on carotid arterial thickness.

Methods: This is a sub-study of the MORPHEOS trial (clinicaltrials.gov: NCT02270658), a randomized controlled study designed to test the impact of CPAP on blood pressure (BP) and vascular parameters in patients with OSA + uncontrolled HTN. This sub-study was designed to compare the 6-months effects of CPAP or placebo (nasal dilator strips, NDS) on arterial stiffness and carotid intima-media thickness (CIMT) in adult patients with uncontrolled hypertension (HTN) using at least one anti-hypertensive medication and moderate-to-severe OSA. Uncontrolled HTN was confirmed by at least one abnormal parameter in the 24 hours ambulatory BP monitoring (ABPM) and $\geq 80\%$ medication adherence evaluated by pill counting after the run-in period (4 weeks). The primary endpoint was carotid-femoral pulse wave velocity (PWV), a validated marker of arterial stiffness. CIMT was the secondary outcome.

Results: Seventy-three patients with uncontrolled HTN and OSA were randomized to NDS ($n=37$) or CPAP ($n=36$), respectively. Baseline clinical variables were similar between the groups and PWV in the NDS and CPAP groups were similar (9 ± 1.5 vs 9.1 ± 1.3 m/s, respectively). CPAP promoted a greater reduction in PWV than NDS at 6 months (Δ Delta PWV: NDS -0.02 ± 0.53 versus CPAP -0.82 ± 1.48 m/s,

$p=0.011$). CIMT did not change significantly in both groups (Δ CIMT: NDS 0 ± 0.09 versus CPAP -0.01 ± 0.08 mm, $p=0.524$).

Conclusions: The treatment for 6 months of OSA with CPAP in patients with uncontrolled HTN and OSA reduces arterial stiffness significantly.

ID: 1438

Sleep Pattern in Adolescents with Obesity: Effects of Sex and Anthropometric Associations

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Keywords

- ▶ adolescents
- ▶ chronotype
- ▶ obesity
- ▶ sleep quality
- ▶ sex

Introduction: Sleep disorders has been increasingly associated to obesity. In this sense, sleep alterations, as reduced sleep time, poor sleep quality and chronotype dysregulation could impair weight control treatments in adolescents with obesity.

Aim: To evaluate the sleep pattern (quality, quantity, and regularity) and its associations with anthropometric measures in adolescents with obesity.

Methods: Sample consisted of male and female teenagers (12 to 17 years old) who attend the pediatric endocrinology ambulatory of Santa Casa de Misericórdia de São Paulo, Brazil. Anthropometric parameters were measured and obesity was defined as $zBMI > 2SD$ (WHO, 2007). Sleep data were measured using the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale, and Eveningness-Morningness Questionnaire. Only subjects with a reasonable level of understanding questionnaires were included. Data were presented as mean (\pm SD) or frequency (%). The level of significance was 5%.

Results: Our sample was composed of 48 adolescents (58.3% female), 13.5 (± 1.4) years old, $zBMI$ 2.79 (± 0.6), abdominal circumference of 103 (± 14.8) cm, neck circumference 38.3 (± 3.8) cm, and waist-to-height ratio 0.6 (± 0.08). No significant differences between sex were found on these parameters. Total sleep time (TST) was 8.2 (± 1.7) hours and the sleep latency was 32 (± 49.3) minutes. Similar values were found on boys and girls. TST correlated positively with waist-to-height ratio. 63.6% of the sample reported to have poor sleep quality, with a higher frequency of poor sleep in girls (82.1% versus 17.9%). PSQI score in girls was 8.74 (± 2.8) versus 5.18 (± 2.9) in boys. Insomnia complaints was reported by 25% of adolescents, being more frequent in girls (37% versus 5.9%). 23.7% of the sample reported excessive daytime sleepiness. 24.4% of the sample had an evening chronotype, 9.8% morning chronotype and most adolescents were classified as intermediate (65.9%).

Conclusions: Adolescents with obesity had a high frequency of poor sleep quality. Girls had more negative results on sleep parameters. Regardless sex, higher sleep

time correlated with higher waist-to-height ratio, a cardio-metabolic risk measure. Due to the effects of sleep on metabolism, sleep pattern analysis should be encouraged in pediatric clinical settings particularly in adolescents undergoing treatment for weight control.

ID: 1439

Effects of Melatonin Administration on Diabetes Risk Markers According to Dietary Lipid Profile in Night Workers

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Keywords

- ▶ fat
- ▶ melatonin
- ▶ diabetes

Introduction: Interactions between circadian clocks and key mediators of chronic low-grade inflammation associated with fat consumption may be important in maintaining metabolic homeostasis and may pose a risk for the development of obesity-associated comorbidities, especially type 2 diabetes.

Aim: The aims of the present study were to evaluate the effects of melatonin administration on diabetes risk markers according to dietary lipid profile (pro-inflammatory versus anti-inflammatory) in excessive weight night workers, and to determine the effect of administration on fat consumption profile.

Methods: A randomized, controlled, double-blind, crossover clinical trial involving 27 nursing professionals working permanent night shifts under a 12x36-hour system was conducted for a period of 25 weeks. The melatonin group (12 weeks) used synthetic melatonin (3 mg) only on days off and between shifts, while the placebo group (12 weeks) was instructed to take a placebo, also on days off and between shifts. For inflammatory characteristics, participants were divided into pro-inflammatory (saturated fats, trans fats and cholesterol) and anti-inflammatory (monounsaturated, polyunsaturated fats and EPA + DHA) groups according to fatty acid determinations. At baseline and at the end of each phase, blood glucose, insulin, glycosylated hemoglobin (HbA1c) plasma concentrations were collected and HOMA-IR was calculated.

Results: Participants had a mean age of 37.1 years (SE 1.1 years) and BMI of 29.9 kg/m² (SE 0.6 kg/m²). Median time working nights at the institution was 5.3 years (IQR 2-4 years). At baseline, mean levels of blood glucose, insulin and HbA1c were within the recommended reference ranges and median HOMA-IR was 3.1 (IQR 2.0-4.8), exceeding the recommended value. Regarding dietary lipid consumption, intake was within recommended levels for 81.5% of participants and median consumption was 60.6 g/day of fat (IQR 28.6-72.7 g/day). Melatonin administration had no effect on fat consumption profile or diabetes risk markers, according to the consumption of pro-inflammatory and anti-inflammatory fats or total fats.

Conclusions: In summary, melatonin administration for 12 weeks had no effect on DM risk markers according to dietary lipid profile (pro-inflammatory or anti-inflammatory potential) in excessive weight night workers. Melatonin promoted no changes in fat consumption profile (total fat, dichotomized into anti-inflammatory and pro-inflammatory, or isolated fats) during the intervention.

ID: 1440

Association between Chronotype, Central Blood Pressure, and Arterial Stiffness of Patients Cared in a Cardiology Clinic

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Keywords

- ▶ chronotype
- ▶ central blood pressure
- ▶ arterial stiffness
- ▶ cardiovascular diseases

Introduction: Cardiovascular diseases (CVD) are one of the main causes of death in the world, being systemic arterial hypertension (HAS) the responsible for over half of the annually unfavorable outcomes. It is a multifactorial condition, frequently asymptomatic, marked by persistent elevation of the blood pressure (BP). Many risk factors contribute for changes in the arterial pressure standards, such as genetics, age, sex, ethnicity and lifestyle. Recent hypotheses show that the sleep and wake patterns and chronotype can be related to arterial stiffness rise, causing increase of the central blood pressure and enabling lesions of target organs (heart, brain, vessels and kidneys).

Aim: To analyze the association between chronotype, central blood pressure and arterial stiffness of patients cared in a cardiology clinic.

Methods: It was a quantitative, prospective and cross-sectional study. Participants ($n = 134$) answered questionnaires regarding sociodemographic, clinical, lifestyle and chronotype (Munich Chronotype Questionnaire) data. Central arterial pressure and arterial stiffness were measured by the triple Pulse Wave Velocity (PWV) method, using the Arteris AOP equipment. Linear regression analyses were performed, adjusted for sex and age.

Results: Participants were 53.2 years old, 103 (76.9%) female and 31 (23.1%) male, 78 (59.1%) did not practice physical activity, 127 (96.2%) were non-smokers, 99 (75%) did not drink alcohol and 79 (60.3%) informed CVD in the family. The average of the cardiovascular data were peripheral BP 129x83mmHg, central BP 119x84mmHg, PWV 7.97 m/s and 24.7 of Augmentation index (AI@75). It was not found association between chronotype and PWV ($\beta = 0.00268$; $p = 0.863$), PASc ($\beta = 0.0166$; $p = 0.885$) and AI@75 ($\beta = 0.0104$; $p = 0.907$).

Conclusions: Chronotype, central arterial pressure and arterial stiffness of patients were not associated. As arterial stiffness tends to increase over time, it is suggested that further longitudinal studies with a greater number of participants needs to be performed.

ID: 1441

Sleep Quality can Affect the Amount of Adverse Symptoms Experienced by COVID-19 VaccinesE. de França¹, C. G. Marques¹, G. S. F. Leite², A. C. O. Magalhães³, É. C. Caperuto⁴, R. V. T. dos Santos¹¹Universidade Federal de São Paulo, São Paulo, SP, Brazil²USP, São Paulo, SP, Brazil³UNESP, Botucatu, SP, Brazil⁴Universidade São Judas Tadeu, São Paulo, SP, Brazil**Keywords**

- ▶ vaccine
- ▶ COVID-19
- ▶ sleep

Introduction: Vaccines for COVID-19 have caused several adverse effects, with those vaccinated reporting different numbers of symptoms (NS).

Aim: To verify whether lifestyle-related factors are associated with the NS due to the COVID-19 vaccine's first dose.

Methods: We used Google Forms to collect information related to the vaccination period, such as sleep quality (Pittsburg Questionnaire-PSQI), physical activity (IPAQ), diets, and alcohol intake. We also collect the type of vaccine taken, if they had COVID-19 or chronic medication use, age, sex, weight, and height. We used SPSS v.26 to perform a stepwise multiple linear regression (SMLR) using the NS as the dependent variable. The participants' lifestyle data and other individual characteristics were used as independent variables. Then we made a decision-tree (DT) regression model (CHAID method) to explore the relationship between lifestyle and vaccine NS. The DT nodes (leaves) were pruned to compare at least 50 samples in each node. In the DT model, we used the NS as the dependent variable and lifestyle data as the independent variable. This study was approved by the Ethical Committee (No.: 0686P/2021).

Results: 300 participants (age, 18 to 75 years old and both genders) answered the questionnaires and reported three types of vaccine that affected different NS (CoronaVac = 0.9 NS, 95% CI = 0.6 to 1.2; Pfizer = 1.8 NS, 95% CI = 1.5 to 2.3 and AstraZeneca = 3.9 NS, 95% CI = 3.5 to 4.3). Vaccine type and age were the only predictors that entered the SMLR model (adjusted R² = 0.304; vaccine, B = 1.038, 95% CI = 9, 0.8 to 1.2; age, B = -0.054, 95% CI = -0.078 to -0.031; *p* = 0.000). In the DT model, using age as a covariate, we identified that a change in sleep efficiency (SE) is related to the NS (ES ≤ 82.8% = 3.3 NS; ES between 82.3 to 93.3% = 2.2 NS; ES > 93.3% = 2.8 NS; *p* = 0.000). Medication used could decrease NS from 2.5 to 1.7 reports in the "82.3 to 93.3%" ES nodule. When using the vaccine type as a covariate, in the DT model, we observed that the PSQI score is related to different NS reports (PSQI score ≤ 3 = 2.2 NS; a PSQI score > 3 = 3.4 NS). Also, the medication used could decrease the NS from 3.7 to 3 reports in the "PSQI score > 3" nodule.

Conclusions: Considering age and type of vaccine, sleep quality significantly influences the number of adverse effects reported from participants who take the COVID-19 vaccine. Medications used can mitigate the NS reported by the participants.

ID: 1442

Do Social Vulnerability Factors Influence Sleep Duration? Data from ELSA-Brazil StudyS. Giatti¹, R. B. Santos¹, B. K. Parise², A. N. Aiello², N. L. Ferreira², P. A. Lotufo², I. M. Bensenor², L. F. Drager³¹Hospital Universitário da Universidade de São Paulo, São Paulo, SP, Brazil²Universidade de São Paulo, São Paulo, SP, Brazil³Instituto do Coração da Universidade de São Paulo, São Paulo, SP, Brazil**Keywords**

- ▶ neighborhood characteristics
- ▶ short sleep duration
- ▶ vulnerability factors

Introduction: There is considerable variability in sleep behaviors. Beyond risk factors and genetics, quality and quantity of sleep is frequently socially driven. The social environment can foster perceptions of safety and social support and can affect mood, anxiety, and stress, which in turn can potentially impact sleep.

Aim: This study aimed to investigate the association between perceived neighborhood characteristics in short versus regular sleepers in a large sample of adults from the ELSA-Brazil.

Methods: This cross-sectional study recruited participants from the São Paulo center of the ELSA-Brazil cohort. Each participant was interviewed and visited the research center for clinical examination according to standard protocols. Four neighborhood dimensions were evaluated: social cohesion, walkability, availability of healthy food and safety, and the neighborhood socioeconomic status (SES) categorized by tertiles. The sleep duration was objectively measured by using an Actiwatch model 2 (Philips Respironics). Participants were instructed to wear the actigraph over a period of 7 consecutive days and nights in the nondominant wrist during a typical week. We performed the evaluation of obstructive sleep apnea (OSA) using a portable monitor in our non-referred population for sleep studies and classified sleep events according to the AASM 2012. OSA was defined by an AHI ≥ 15 events per hour of recording. We also evaluated the association between the tertiles of the social factors and short (≤ 6h) and regular (> 6h) sleep duration in men and women, adjusting by age, education, ethnicity, per capita income, OSA status, antidepressant medication, alcohol abuse and physical activity.

Results: A total of 1.816 participants were included in the final analysis (age 49 ± 8 years; 43.5% men; 11% retired; 33% with OSA). The average total sleep time was 396 ± 59 minutes. Overall, we found no association between any social vulnerability domains with short sleep duration. However, the stratified analysis by sex revealed an independent association between short sleepers and the second tertile of social cohesion (OR 0.503; IC 0.319-0.898; *p* = 0.018) as well as the first tertile of availability of healthy food (OR 0.536; IC 0.284-0.890; *p* = 0.018) in men only.

Conclusions: Our results suggest a potential role of vulnerability domains in influencing short sleep duration status particularly in adult men.

ID: 1444

Sleep Duration during Workdays in Fixed Shift Workers: A Cross-sectional Study Carried Out in the Cross-sectional Study Carried Out in Central Western BrazilB. Gonçalves¹, L. F. Soares², M. F. Lemos², R. Lucchese², G. C. S. Leão³¹Copacabana Tecnologia da Informação, São Paulo, SP, Brazil²Universidade Federal de Catalão, Catalão, GO, Brazil³Grupo de Pesquisa MACROS/Universidade Federal de Catalão, Catalão, GO, Brazil**Keywords**

- ▶ fixed shift workers
- ▶ actigraphy
- ▶ sleep hygiene

Introduction: Evidence from the scientific literature has shown that shift work, especially atypical schedules, has been recognized as individuals who are known to be predisposed to present sleep disorders. However, studies analyzing this association in fixed shift workers are in fact scarce in the literature.

Aim: To characterize and compare the sleep patterns in the activity-rest cycle of workers in fixed shifts.

Methods: A cross-sectional study was conducted with three fixed shift workers from a mining company under real life conditions. Individuals were evaluated over six days in a shift schedule performed as follow: A – 08:00 to 16:00, B – 16:00 to 00:00, and C – 00:00 to 08:00), using a smartwatch ez-rest as an actigraphy.

Results: This study included 37 participants. During workdays, the workers in shift A (M = 07:09, SD = 00:46, $p = 0.018$) had longer sleep time when compared with shift B (M = 05:49, SD = 01:16).

Conclusions: The results demonstrate the need to develop actions aimed at a better sleep pattern in these individuals in all work shifts.

ID: 1446

Integrated System for Monitoring Individuals with Obstructive Sleep Apnea Treated with Positive Airway Pressure – A Proposal to the Public Health System in the State of CearáC. F. Leite¹, N. F. Leite², M. M. Costa², R. R. Calixto², A. J. X. Santiago², K. A. Paiva¹, M. L. Melo¹, S. C. Magalhães¹, M. A. Sobreira-Neto¹, A. R. Alexandria²¹Universidade Federal do Ceará, Fortaleza, CE, Brazil²Instituto Federal de Educação, Ciência e Tecnologia do Ceará, Fortaleza, CE, Brazil**Keywords**

- ▶ obstructive sleep apnea
- ▶ continuous positive airway pressure
- ▶ public health system
- ▶ management of science technology and innovation in health

Introduction: Obstructive sleep apnea (OSA) is characterized by recurrent episodes of partial or total upper airway obstruction, with interruptions of the sleep cycle, often associated with intermittent hypoxic/hypercapnic stress. The prevalence of OSA is high and is strongly associated with cerebrovascular and cardiovascular events.

Its gold standard treatment is performed through the application of positive airway pressure. This treatment, when properly instituted, is cost-effective. In the state of Ceará, four sleep-specialized services assist and follow patients undergoing treatment with positive airway pressure. The positive pressure equipment used for the treatment is provided to patients through the State Health Department.

Aim: To develop a system that can be applied to the public health system (SUS – Sistema Único de Saúde) for the management and monitoring of patients treated with positive airway pressure, who are followed up in specialized sleep services. From this integrated information system, it is intended to generate a bigdata that allows offering solutions in the sphere of management, clinical follow-up and science based on information generated by artificial intelligence models.

Methods: The developed system uses cloud computing techniques to interact with the user through conventional browsers and the acquired data are stored in the cloud, forming a bigdata. Artificial intelligence techniques will be used to extract information that enhances the treatment of patients with OSA, both individually and collectively.

Results: The platform is under construction, based on the research of the necessary variables and constructs. An entity-relationship diagram was produced and integrated into the construction process. The combined variables for the artificial intelligence strategy are in the adjustment phase.

Conclusions: It is expected that the developed program will make it possible to expand the follow-up of patients followed up in specialized sleep services, enabling better communication between services from the public health system, as well as providing information on the effectiveness of therapy to the state of Ceará. This study is financed by the National Council for Scientific and Technological Development (CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico), approved in grant 409321/2021–4.

ID: 1448

Cross-sectional Study of Sociodemographic Characteristics in Physical Education Students with Insomnia during Remote Education

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Keywords

- ▶ sleep
- ▶ student health
- ▶ sleep-wake disorders

Introduction: The pandemic hit many countries in 2020, including Brazil, which joined numerous measures to combat the spread of the virus, interfering with the life of society, with the requirement of social isolation and that the recommendation “stay at home” adopted to stop the spread of COVID-19 affected higher education, bringing to university students significant changes, from an economic point of view, in the physical, mental, emotional, social, spiritual, environmental, political aspects and negative effects on the quality and quantity of sleep and, consequently, the installation of sleep disorders. sleep, especially insomnia. The interest in the subject arises as a

result of the real situation of the COVID-19 pandemic, justified by the teaching model adopted at Public Universities, leading students to remain more exposed to the use of technologies, in addition to affecting the organization of personal life and changes in routines. daily life, not only of this group, but of the entire academic and family community, which can negatively affect their health and consequently generate losses in academic training, being an emerging, incipient issue and still little investigated in licentiate programs in Northern Brazil.

Aim: To estimate the prevalence of insomnia in Physical Education students during remote teaching.

Methods: Cross-sectional study with students of the Degree in Physical Education at a public university through non-probabilistic sampling. The instrument used to measure insomnia was the Insomnia Severity Index, validated for use in Brazil. The project was approved by the Ethics and Research Committee through opinion No. 5,117,581. Data were analyzed using the Statistical Package for Social Sciences software.

Results: Sixty-eight students participated in the study, 55.9% ($n=38$) were female and 40.1% ($n=30$) were male. Of these, it was found that 51.5% ($n=35$) have insomnia and 48.5% ($n=33$) without insomnia. The degree of insomnia severity according to the gender variable was more prevalent in females, with emphasis on 42.1% ($n=16$) for mild absence and 18.4% ($n=7$) for moderate insomnia.

Conclusions: The prevalence of insomnia in Physical Education program students was high, being more frequent and more severe in female students. Thus, it is important in the educational field to assess sleep disorders with strategies to promote and prevent sleep-related changes in university students.

ID: 1450

Relationship of Sleep and Metabolic Syndrome Parameters in Women with Severe Obesity

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Keywords

- ▶ excessive daytime sleepiness
- ▶ metabolic syndrome
- ▶ obesity
- ▶ sleep duration

Introduction: Obesity seems to be linked by a bidirectional mechanism with sleep disorders and both are risk factors for the development of metabolic syndrome (MS). The MS is a complex set of factors that significantly increases the risk of cardiovascular diseases.

Aim: To evaluate excessive daytime sleepiness (EDS) in women with severe obesity and its relationship with MS and its parameters.

Methods: Women with a body mass index (BMI) greater than or equal to 40 kg/m² were recruited. At the first outpatient consultation, weight, height, waist (WC) and hip (HC) circumferences were measured, and blood samples were collected to analyze the levels of fasting glucose, insulin, glycated hemoglobin (HbA1c), triglycerides (TG), total cholesterol (TC), high (HDL-c), and low density (LDL-c) lipids. It was calculated the values of HOMA-IR and HOMA-β and

systolic (SBP), and diastolic blood pressure (DBP) data were obtained from medical records. The Epworth Sleepiness questionnaire was applied, and women were classified with EDS when Epworth score \geq to 11. Moreover, volunteers were identified with MS according to the criteria of the International Diabetes Federation (2005) and sleep duration was asked. The Shapiro-Wilk test was used to analyze the normality of the variables, the univariate GLM test was used to compare the mean between the groups and the Pearson and Spearman correlation tests were applied.

Results: Forty-three women participated of the study with a mean age of 40.12 \pm 8.41 years and a BMI of 48.63 \pm 6.87, with 76.74% ($n=33$) having MS and 44.2% ($n=19$) showed EDS. In the group with MS, the Epworth questionnaire score correlated with age ($p=0.031$ rho = 0.376), DBP ($p=0.021$ rho = 0.400) and TG/HDL-c ratio ($p=0.049$ rho = 0.345) and sleep duration with glucose ($p=0.034$ rho = -0.370) and HbA1c ($p=0.008$ rho = -0.453). Similarly, in the total sample, sleep duration correlated with glucose ($p=0.052$ rho = -0.299), HbA1c ($p=0.019$ rho = -0.357) and additionally with DBP ($p=0.057$ rho = -0.293).

Conclusions: Data suggest that sleep duration in severe obesity is correlated with one of the main pathophysiological markers of MS. Among women with MS, the age seems to be an important factor to be considered to evaluate sleep quality. CNPq Edital No. 434159/2018-2; FUNAPE: No. 01/2022.

ID: 1451

Inadequate Nocturnal Eating Behaviors: Can Night Eating Syndrome and Sleep-related Eating Disorder Coexist? Case Report Description

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Keywords

- ▶ sleep-related eating disorder
- ▶ parasomnias
- ▶ eating disorder
- ▶ sleepwalking
- ▶ night eating syndrome

Introduction: A nocturnal eating behavior was described in 1955, when night eating syndrome (NES), which is characterized by excessive food intake before going to bed was reported. People with NES experience morning anorexia and difficulty falling asleep. The circadian cycle of eating is possibly delayed and unlike people with a sleep-related eating disorder (SRED), people with NES remember the events throughout the night. SRED is a parasomnia with episodes of amnesic sleepwalking associated with eating behavior. These events occur after a partial arousal from sleep, and the content may be eat unusual food items or atypical combinations. The main concerns with SRED are related to the safety during the food preparation and the metabolic consequences.

Aim: To present a case of two main types of inappropriate nocturnal eating behaviors coexisting: nocturnal eating syndrome and sleep-related eating disorder.

Methods: Anamnesis and video-polysomnography (vPSG) were performed.

Results: We described a 56-year-old patient referred to our sleep medicine unit reporting episodes of nocturnal eating behavior since she was in her early 20s. She

experiences nocturnal awakenings accompanied by an irresistible need to consume high calorie snacks, which worsen in periods of greater anxiety. In most of these episodes, the patient has full memory but eventually reports total or partial amnesia associated with peculiar food intake. The patient also complains of poor quality of sleep with significant daytime impact (excessive sleepiness). The patient usually wakes up in the morning without appetite and avoids high-calorie food during the day. As comorbidities, she presents diabetes, hypertension, and anxiety, taking 80mg of fluoxetine and 300mg of bupropion per day. She has been a smoker for 25 years and underwent bariatric surgery 20 years ago. She has a history of childhood parasomnia unrelated to eating with remission of symptoms during adolescence. The vPSG evaluation revealed reduction of sleep efficiency and an increase of periodic leg movements (31.7/h) and microarousal index (10.4/h). The apnea-hypopnea index was normal.

Conclusions: With this report, we draw attention to the possibility of the coexistence of inadequate nocturnal eating behaviors and being able to identify characteristics frequently associated with these patients.

ID: 1452

Daytime Sleepiness is Related to Lower Consumption of Natural or Minimally Processed Foods in Women with Severe Obesity

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Keywords

- ▶ NOVA
- ▶ sleep
- ▶ quality
- ▶ daytime sleepiness

Introduction: The prevalence of obesity and related disorders has been increasing gradually in recent years and is a public health problem. One of the factors associated with weight gain is poor sleep quality. Previous studies have shown that sleep inefficiency is related to preferences for foods with higher energy density. Recently, the degree of food processing has gained attention as a new look to classify the food profile. However, few studies have evaluated the influence of sleep quality on food intake according to the degree of processing.

Aim: The aim of this study was to evaluate whether sleep quality is related to food intake, according to the new food processing classification (NOVA).

Methods: Forty-one women with severe obesity were evaluated. Food intake was assessed by a food frequency questionnaire (FFQ), then classified according to NOVA (Ministério da Saúde, 2014), in fresh or minimally processed foods; processed foods and ultra-processed foods. The frequency of food intake was transformed into a score as described by FERNÁNDEZ (2002). Sleep quality was assessed by the Epworth sleepiness scale (ESS) and the women were grouped according to classification as normal level of daytime sleepiness (NDS) and excessive daytime sleepiness (EDS). Normality was evaluated by the Shapiro Wilk test and the t. test for an independent sample was performed to evaluate the association between sleep and food intake using the

RStudio software. The present was approved by the Ethics and Research Committees of the Hospital Geral de Goiânia.

Results: Regarding daytime sleepiness, 59.5% of the women were classified as NDS and 40.5% as EDS. The volunteers classified as normal had a mean age of 40 years, BMI 48.4 kg/m² and had an average consumption of fresh foods two to four times a week, processed foods, once a week and consumption of ultra-processed foods, one to three times a month. The volunteers classified as excessive daytime sleepiness had a mean age of 43.3 years, BMI 48.6 kg/m² and had an average consumption of fresh foods, once a week, of processed foods, once a week, and consumption of ultra-processed foods, one to three times a week. It was observed that in EDS group the frequency of natural or minimally processed food was significant lower than in NDS group ($p < 0.00$).

Conclusions: The results suggest that EDS might influence in food choice leading to lower consumption of in natural and unprocessed food among women with severe obesity.

Financing: FAPEG, FUNAPE.

ID: 1453

Analysis of Locomotor Behavior of an Animal Model of RLS Induced by Iron Deficiency Submitted to Pharmacological Treatments and Physical Exercise

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Keywords

- ▶ restless legs syndrome
- ▶ behavior
- ▶ sleep
- ▶ treatments

Introduction: Clinical conditions regarding restless legs syndrome (RLS) have well-characterized pathophysiological conditions in humans and their investigation is also reproducible in experimental models. In this sense, pharmacological and non-pharmacological treatments that investigate genetic aspects, neurophysiological and biochemical alterations that cause alterations in the dopaminergic and glutamatergic systems, as well as alterations in the adenosinergic system, are using the animal model to understand mechanisms. The rodent model for RLS through iron deficiency stands out, reproducing clinical and sleep conditions similar to those of patients such as sleep architecture, increased wakefulness at the end of the day and behavioral changes that mimic RLS-related characteristics.

Aim: To evaluate exploratory and locomotor behavior in an iron-deficient animal model for RLS during different pharmacological treatments and physical exercise.

Methods: The experimental protocol was approved by the Ethics Committee for the Use of Animals (5561-1/2020). Adult male Wistar rats ($n = 43$) divided into 6 groups: Control; DFe/Control; DFe/DOPA (dopaminergic agonist treatment); DFe/OPI (opioid treatment); DFe/GABA (treatment with $\alpha 2\delta$ gabapentin ligand); DFe/EF (treatment with physical exercise). In the experimental procedure, with 80 days of life, pharmacological interventions were started, physical exercise lasting 4 weeks. And the behavioral test (Open Field) once a week in parallel with the intervention (9-11am). For statistical analysis, the mixed linear analysis model and the post hoc Bonferroni test were used, $p < 0.05$.

Results: The dopaminergic treatment group presented an ambulation total with parameters close to the healthy control, in addition, it indicated a significant reduction when compared with the iron deficiency group ($p < 0.05$). On the other hand, in the opioid group, greater total ambulation was observed when compared with the dopamine and control groups ($p < 0.01$). The treatment with physical exercise presented a tendency of results close to dopamine and to the control, with better effects than specific pharmacological agents.

Conclusions: Taken together, the findings suggest that dopaminergic agents in the treatment of the animal model of RLS, have beneficial effects and better results when compared with other treatments. It is observed that physical exercise is relevant in improving locomotor behavior.

ID: 1456

Association between Social Jetlag, Central Blood Pressure, and Pulse Wave Velocity in Shift Workers

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Keywords

- ▶ jetlag social
- ▶ central blood pressure
- ▶ arterial stiffness
- ▶ shift workers

Introduction: Large-scale world production, 24 hours a day, led to the expansion of the working day beyond the daytime, making shift work more common. Performing work tasks at night increases the chance of changes in biological rhythms and adverse health effects. Shift work can misalign biological rhythms and cause changes in circadian rhythms signaling that the body should be awake when it should be sleeping, which can lead to social jetlag. Sleep deprivation due to night work has a proven relationship with blood pressure changes and a higher risk of developing cardiovascular diseases. Evidence suggests that early alteration of central parameters (pulse wave velocity and central blood pressure) is associated with increased cardiovascular risk and unfavorable clinical outcomes.

Aim: To analyze the association between social jetlag, central blood pressure and pulse wave velocity in shift workers.

Methods: It was a quantitative, prospective and cross-sectional study. The study included 83 nursing professionals, being 64 shift workers and 19 day workers. This study had a quantitative and cross-sectional approach. The participants answered questions related to sociodemographic, health conditions, lifestyle, work timetable and social jetlag data through validated questionnaires. Central arterial pressure was measured by the triple Pulse Wave Velocity (PWV) method, using the Arteris AOP equipment.

Results: The mean age of participants was 44.4 years, being 76 females (91.6%) and 7 males (8.4%). More than half (62.7%) did not use to practice physical activity. The body mass index average was 28,1Kg/m², 81 (97.6%) were not smokers and 43 (51.8%) drank alcoholic beverages. The average of the cardiovascular data were central blood pressure

105x81mmHg, PWV 6,54m/s and 19,6 of Augmentation index (AI@75). When adjusted by sex and age in a linear regression analysis, statistically significant associations between social jetlag and PWV ($\beta = 0.125$; $p = 0.043$) and jetlag and cSBP ($\beta = 2.808$; $p = 0.031$) were found.

Conclusions: In the population studied, sleep deprivation, represented by social jetlag, was associated with higher values of cSBP and PWV, which allows us to infer that shift work and its repercussions constitute a risk of arterial stiffness. and long-term negative cardiovascular outcomes.

ID: 1460

Relationship between Physical and Ventilatory Capacity with Subjective Sleep Sensation in Patients with Chagas Disease

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Keywords

- ▶ Chagas disease
- ▶ cardiopulmonary exercise test
- ▶ 6 minute walk test
- ▶ sleep disorders

Introduction: Chagas disease is a pathology of epidemiological importance in Brazil and can be associated with cardiac and digestive involvement. The cardiac dysfunction of the disease, characterized by cardiac remodeling, is related to the loss of physical and ventilatory capacity and sleep-disordered breathing, causing damage to the restorative function of sleep.

Aim: In view of the commitments mentioned, we aimed to correlate physical and ventilatory capacity with changes in the subjective sensation of sleep in these patients.

Methods: Subjective sleep assessment with the Pittsburgh scale and functional physical capacity assessment with Cardiopulmonary Test (gold standard) and 6-Minute Walk Test were performed. The ethical aspects of the study were evaluated and approved by the Research Ethics Committee of the State University of Rio Grande do Norte, with CAAE 53362316.8.0000.5294. Results: There was a significant correlation of the values of Pittsburgh scale with the percentage of VO₂max ($p = 0.009$; $r = -0.342$), Ventilatory Equivalent for CO₂ ($p = 0.041$; $r = -0.272$), Respiratory Quotient ($p = 0.021$; $r = -0.305$) and distance covered in the 6-Minute Walk Test ($p = 0.029$; $r = -0.289$).

Results: There was a significant correlation of the values of Pittsburgh scale with the percentage of VO₂max ($p = 0.009$; $r = -0.342$), Ventilatory Equivalent for CO₂ ($p = 0.041$; $r = -0.272$), Respiratory Quotient ($p = 0.021$; $r = -0.305$) and distance covered in the 6-Minute Walk Test ($p = 0.029$; $r = -0.289$).

Conclusions: The worse physical and ventilatory capacity of the patients during the stress tests were related to a worse subjective sleep sensation in patients with Chagas disease, so that these tests can infer sleep alterations in these patients.

ID: 1461

Effects of CPAP Therapy on the HDL Metabolism of Patients with Metabolic Syndrome and Obstructive Sleep Apnea: A Substudy of TREATOSA-MS Randomized TrialS. Q. C. Giampá¹, T. M. Tavoni², S. F. Furlan¹, L. S. Freitas¹, T. A. Macedo¹, F. C. Martins³, L. A. Bortolotto¹, G. Lorenzi-Filho³, R. C. Maranhão², L. F. Drager¹¹Unidade de Hipertensão, Instituto do Coração (InCor) do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP), São Paulo, SP, Brazil²Laboratório de Metabolismo de Lípidos, Instituto do Coração (InCor) do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (FMUSP), São Paulo, SP, Brazil³Laboratório do Sono da Disciplina de Pneumologia, Instituto do Coração (InCor) do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP), São Paulo, SP, Brazil**Keywords**

- ▶ cholesterol
- ▶ HDL
- ▶ continuous positive airway pressure
- ▶ lipid metabolism
- ▶ metabolic syndrome
- ▶ sleep apnea
- ▶ obstructive

Introduction: There are growing evidence from translational and clinical studies that obstructive sleep apnea (OSA) is associated with chylomicron and triglycerides metabolism impairment that are partially reversed by using continuous positive airway pressure (CPAP). However, the effect of CPAP therapy on high-density lipoprotein (HDL) metabolism is unknown.

Aim: To examine the effects of 6 months of CPAP therapy on markers of HDL metabolism of patients with metabolic syndrome (MS) and OSA.

Methods: The TREATOSA-MS is a randomized placebo-controlled trial that enrolled adult patients with a recent diagnosis of MS (NCEP III criteria) and moderate to severe OSA (apnea-hypopnea index, AHI ≥ 15 events/h) to undergo 6 months of therapeutic CPAP or nasal dilator strips (placebo group). All patients were non-smokers and used no medications. In this substudy, fasting blood samples collected before and after each intervention were selected for HDL metabolism analysis and plasma lipid determination. Free and esterified cholesterol transfers to HDL were performed by an artificial nanoemulsion to HDL assay. In addition, plasma levels of cholesteryl ester transfer protein (CETP) and the lecithin-cholesterol acyltransferase (LCAT) were determined by enzyme-linked immunosorbent assay.

Results: Sixty-three patients were included in this substudy (placebo: $n = 30$; CPAP: $n = 33$). Compared with baseline, 6 months of CPAP treatment had no significant effects on the free ($\Delta: 0.13 \pm 0.59$; $p = 0.553$) and esterified cholesterol transfer ($\Delta: 0.01 \pm 0.42$; $p = 0.933$). No significant differences in CETP ($p = 0.26$) and LCAT ($p = 0.68$) were observed between the CPAP and placebo groups.

Conclusions: Six months of CPAP therapy did not have significant effects on markers of HDL metabolism in patients with MS and moderate to severe OSA.

ID: 1462

Mastication and Deglutition in Children with Down Syndrome and Obstructive Sleep ApneaD. B. E. Silva¹, S. A. T. Weber¹, C. D. C. Correa², C. R. B. D. Fonseca¹, K. Santos¹¹Universidade Estadual Paulista/Botucatu, Botucatu, SP, Brazil²Uniplan, Brasília, DF, Brazil**Keywords**

- ▶ Down syndrome
- ▶ obstructive sleep apnea
- ▶ children
- ▶ mastication
- ▶ deglutition

Introduction: Down Syndrome or Trisomy 21 is the most common genetic disorder. The extra chromosome leads to some physical traits. Due to their specific craniofacial position, low muscle tone besides obesity and macroglossia, Down Syndrome is an important risk factor to Obstructive Sleep Apnea. However, the oral functions are not evaluated routinely, especially in children.

Aim: The study aimed to evaluate the short orofacial myofunctional protocol (ShOM) in Down Syndrome (DS) children and correlate it to polysomnographic results.

Methods: The study was approved by the local ethics commission. All DS children of the pediatric ambulatory were invited to perform full-night polysomnography, independently of respiratory complaints as snoring or observed apneas. At the time of the exam, all children performed the short orofacial myofunctional protocol exam ShOM, which classifies respiratory pattern, competency, and tonus of the lips, the position of the tongue, deglutition, Rosenthal test, with a score varying from 0 to 7.

Results: 16 Down Syndrome children, 8 girls, aged 4 to 15 years old, mean age 9.2 years, were included. All except one were diagnosed Obstructive Sleep Apnea (OSA), 8 had severe and 6 moderate. The mean ShOM score was 5.9 (± 1.14). 13 (81.25%) children had oral breathing, 14 (93.33%) a positive Rosenthal test, 8 (53.33%) had a high archer palate, 9 (56.25%) showed disorders in lip competence and 14 (93.33%) in lip tonus, tongue posture was erroneous in 14 (87.5%). Mastication was classified altered in 15 children. 11 (73.33%) performed anterior type, trituration on the incisors. Some of other behaviors and signs analyzed was altered posture of the head in 10 children (66.66%) and food escape was observed in 11 (73.33%). Disorders in deglutition were found in 15 children. 11 (88.75%) children showed light lips contraction, 12 (75%) had tongue interposed between teeth, 15 (93.75%) exhibited tension of the facial musculature, 12 (75%) food escape, 4 (25%) showed choking and noise. ShOM scores rates 6 and 7 correlated to severe OSA (Pearson correlation coefficient $p = 0,0584$).

Conclusions: Almost all Down syndrome children showed disorders in mastication and deglutition, ShOM higher scores being associated to severe OSA. Orofacial myofunctional evaluation may help to identify different phenotypes in Down syndrome children with OSA like in non-syndromic ones, enhancing the need for a multidisciplinary approach.

ID: 1463

Integral Approach of Bruxism and Consequences in a Family Routine: A Clinical Case Report

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Keywords

- ▶ bruxism
- ▶ child behavior
- ▶ drug therapy

Introduction: Bruxism is a behavior characterized by masticatory muscle activity. It has a multifactorial etiology, being associated with sleep characteristics.

Aim: To report a clinical case of a young child with bruxism and the parents' attitude.

Methods: A 3-year-old female patient, an only child, was assisted by the Sleep Health Care Extension project at a Brazilian dental school. The main complaint of the parents was the noise produced by the child, grinding her teeth. A detailed anamnesis and clinical oral examination were performed and parents answered the Brazilian version of the Sleep Disorders Scale for Children (SDSC) and the Pediatric Daytime Sleepiness Scale (PDSS) were used. A seven-day sleep diary was given to parents to verify the child's habits at three different times during three months. After the first analysis of the sleep diary, the homeopathic tincture of Melissa Officinalis was prescribed at a dose of one drop per age in the evening after dinner. A multidisciplinary team accompanied the patient and a descriptive analysis of the follow-up data was performed.

Results: In the first evaluation of the sleep diary, it was observed that the child had no sleep routine and the average of hours of sleep per night ranged from 5 to 8 hours. There were nocturnal awakenings and reports of nightmares. The SDSC score was 45 points, indicating the presence of sleep disorders. The PDSS presented a high score (24). The clinical dental examination revealed a deep palate and anterior open bite. Furthermore, the child had the habit of pacifier which presented bites on the bulb, characterizing the teeth grinding reported by the parents. During the weekly follow-up, the child presented aggressive behavior and, when contradicted, she ground her teeth, which made her mother very distressed. The mother herself reported that she ended up giving in to her daughter's wishes so that she would stop the grinding behavior. After one month of medication, it was verified an improvement in sleep routines was marked by fewer episodes of nocturnal awakes and nightmares. At the last evaluation, improvements in the scores on the SDSC and PDSS scales were verified.

Conclusions: Follow-up with a sleep diary, SDSC, PDSS, and homeopathic medication showed a positive approach in the behavior of this child with consequent improvement in the quality of life of the whole family.

ID: 1464

Comparative Study of Sleep Patterns between Healthy Individuals and Those with Parkinson's Disease

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Keywords

- ▶ Parkinson's disease
- ▶ sleep disorders
- ▶ rem behavior disorders
- ▶ polysomnography
- ▶ sleep complaints

Introduction: Sleep-related complaints are common in individuals with Parkinson's disease (PD). Polysomnography is an objective way of assessing sleep structures, allowing for sleep disturbances to be quantified.

Aim: To compare the structure and sleep disturbances between healthy individuals and those with PD using polysomnography type I (PSG-I).

Methods: This is a cross-sectional study with data collected from the medical records of healthy controls and idiopathic PD individuals, with sleep related complaints, submitted to the PSG-I exam, beginning in 2015 at the Sarah Network of Rehabilitation Hospitals in Belo Horizonte, Brazil.

Results: This study analyzed data from 56 controls (25 men and 31 women) and 98 individuals with PD (59 men and 39 women), aged 51 (± 9.5) and 65.6 (± 10) years, upon the application of PSG-I, respectively ($p < 0.001$). The time of PD was 6.3 (± 4) years. Regarding associated diseases, systemic arterial hypertension was more prevalent in this group ($p = 0.005$). Regarding sleep characteristics, our study found an increase in waking hours ($p < 0.001$), a decrease in total sleep time ($p < 0.001$) and sleep efficiency ($p < 0.001$), and an increase in REM sleep latency ($p = 0.041$). The apnea/hypopnea index in REM sleep ($p = 0.033$), the presence of REM sleep behavioral disorder ($p < 0.001$), as well REM without atony ($p < 0.001$) were more common in the PD group. No difference was identified between the groups regarding the use of antidepressants ($p = 0.857$), antipsychotics ($p = 0.999$), and sleep inducers ($p = 0.555$). A correlation was found between age at the time of PSG-I in individuals with PD and total sleep time ($r_s = -0.299$, $p = 0.003$) and the number of micro-arousals related to limb movements ($r_s = -0.312$, $p = 0.002$). A correlation was also found between the PD time and the percentage of N2 ($r_s = 0.251$, $p = 0.013$), N3 ($r_s = -0.251$, $p = 0.013$), and REM sleep latency ($r_s = 0.234$, $p = 0.021$).

Conclusions: Individuals with PD showed greater impairment in the structural characteristics of sleep when compared with the control group, in addition to a higher prevalence of sleep disorders. The age of the individual with PD when the PSG-I was applied and the duration of the disease influenced the severity of these changes. The performance of PSG-I is extremely important for the detection of changes in the macro/microstructures of sleep in individuals with PD, which can facilitate the understanding of the prognosis and guide clinical management.

ID: 1465

Assessment of Sleep Quality by Questionnaire x Actigraphy

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Keywords

- ▶ sleep quality
- ▶ sleep quantity
- ▶ subjective sleep

- ▶ objective sleep
- ▶ actigraphy

Introduction: Living in a 24-hour society, despite being comfortable for some, causes a series of health problems for workers. (Moreno CRC, Fisher FM, Rotemberg, L, 2003). One of these problems could be a lack of sleep caused by irregular working hours or alternating work shifts (Facundo LA et al, 2022). Interventions to minimize the problems caused by sleep deprivation are widely publicized in the scientific community, and many of them assess sleep quality through questionnaires. Interventions to minimize the problems caused by sleep deprivation are frequently publicized in the scientific community, and many of them assess sleep quality through questionnaires, with the Pittsburgh Sleep Quality Index (PSQI) being widely used (Araujo PAB et al., 2015; Del Rio Joao, KA et al, 2016). However, people often have a bad perception of their sleep time and can answer the questionnaire wrong.

Aim: This study aimed to analyze the relationship between a subjective assessment (PSQI) and an objective assessment (actigraphy).

Methods: Forty-three workers were recruited from a company with a rotating work shift, and they used an actigraph for 15 days to observe their sleep patterns. After use, they were asked to answer the PSQI questionnaire. Results were compared using Paired Samples T-Test using Jamovi software for Windows version 2.2.5 solid.

Results: There was a significant difference between the sleep quality assessed in the PSQI questionnaire and the actigraphy record (df 41.00 $p < 0.01$).

Conclusions: Sleep loss and sleep quality are significant variables to be evaluated in sleep research, but in some specific populations, caution and better observation of the application of questionnaires are necessary to assess sleep quality.

ID: 1466

Effectiveness and Adherence of Patients with Obstructive Sleep Apnea (OSA) Treated with Orofacial Myofunctional Therapy (OMT): A Pilot Study

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Keywords

- ▶ myofunctional therapy
- ▶ obstructive sleep apnea
- ▶ mhealth

Introduction: Orofacial Myofunctional Therapy (OMT) is related to the treatments indicated for patients with mild and moderate OSA (1), (2), (3), (4), one of the main challenges for OMT is to achieve a percentage of adherence that guarantees the scope of results (5), (6); Few studies measure adherence rates and their relationship with treatment effectiveness, which can be achieved with mHealth and telemedicine methodologies (7), (8).

Aim: To measure the effectiveness and adherence in a group of adult patients with mild and moderate Obstructive Sleep Apnea treated with Orofacial Myofunctional Therapy (OMT) administered through the Dr. Neumo app.

Methods: 25 patients with OSA, treated with OMT through the Dr. Neumo®app, composed of: 6 levels of complexity, 54 sessions, remote controls between each level, symptom reporting function; App monitoring by therapist and registration of day and time of access; which included sleep hygiene practices, oropharyngeal exercises, and mindfulness strategies for breathing, chewing, and swallowing functions. Output indicators were measured by type 2 polysomnography.

Results: In a window between November 1, 2021 and May 15, 2022, 3 groups of patients were identified according to the time it took to complete the treatment: (a) average group: 12 weeks, (b) outstanding group: less than 11 weeks and (c) large group: 13 weeks or more. The p values calculated for the student's t tests allow us to conclude that the OMT administered through the Dr. Neumo app manages to significantly reduce (with a level of 5%) the score on the Epworth sleepiness scales (p value of 0.00097), the Apnea Hypopnea Index (p value of 0.0008) and the Snoring Index (p value of 4.1×10^{-5}). The results indicate a better performance in women and in patients who finish treatment less than 13 weeks and a poor performance in men and in the extended group. The initial expectations of the treatment (achieve a restful sleep, improve the quality of life and improve the quality of sleep) were significantly associated with the achievements perceived by the patients calculated through the Fischer exact test (p value 0.0002): a) restful sleep b) improvement in sleep quality c) no improvement in sleep quality and d) non-restful sleep.

Conclusions: The OMT administered through the Dr. Neumo app would allow the measurement of adherence and efficacy rates of patients. OMT was effective in treating patients with mild and moderate OSA.

ID: 1469

Relationship of Sleep Duration, Quality, and Metabolic Parameters in Women with Severe Obesity

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Keywords

- ▶ obesity
- ▶ sleep
- ▶ PSQI
- ▶ glycemic profile

Introduction: Sleep has an important role in maintaining health. Short sleep duration and poor sleep quality have been increasingly recognized as factors that influence metabolism and endocrine dysfunction, increasing the risk of cardiovascular disease. In individuals with obesity, both the quality and duration of sleep may be impaired.

Aim: To evaluate the quality and duration of sleep in women with severe obesity and to relate it to metabolic parameters.

Methods: This is a cross-sectional study with women with a body mass index (BMI) greater than or equal to 40 kg/m² who will undergo bariatric surgery. Weight, height, hip (HC) and waist (WC) circumferences were measured and blood samples were collected to assess the glycemic and lipid profiles. Homa-IR and Homa- β values were calculated and systolic (SBP) and diastolic (DBP) blood pressure values

were collected from medical records. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) and they were classified as good sleep quality (< 5) and poor sleep quality (≥ 5). The variables were analyzed for normality using the Shapiro-Wilk test. For comparison of the mean between the groups, the univariate GLM was used and the Pearson and Spearman correlations were performed.

Results: A total of 39 women were enrolled in this study. The mean age was 40.21 ± 8.68 years, with mean BMI of 48.65 ± 7.19 kg/m², PQSI score of 8.15 ± 5.47 and sleep duration of 7.09 ± 1.09 hour. In the total sample, a correlation was observed between sleep duration and HbA1c ($p = 0.021$ rho = -0.368). It was observed that 71.79% ($n = 28$) of the volunteers had poor sleep quality. In the low-quality sleep group, it was observed a higher mean WC ($p = 0.035$) and correlations of sleep duration with glucose ($p = 0.024$ rho = -0.427) and Homa- β ($p = 0.037$ rho = 0.396).

Conclusions: Women with severe obesity have high prevalence of poor sleep quality. Data suggest that poor sleep quality may be factors that influence metabolic parameters, such as glycemic control and waist circumference. CNPq Edital No. 434159/2018-2; FUNAPE: n°01/2022.

ID: 1471

Pseudo-REM Behavior Disorder in a Patient with Obstructive Sleep Apnea, Parkinsonism, and REM without Atonia: Predictor or Overlap of Two Syndromes?

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Keywords

- ▶ REM behavior disorder
- ▶ obstructive sleep apnea
- ▶ parkinsonism

Introduction: Complex motor-behavioral events were found to occur upon arousals from obstructive apnea/hypopnea in patients with OSA, which is named OSA pseudo-RBD and characteristically preserves REM atonia. REM sleep behavior disorder (RBD) presents as a motor-behavioral, dream enactment episode during REM sleep also as a consequence of REM without atonia (RWA). RBD usually is associated with neurodegenerative diseases. In this case report, the same patient presents symptoms of OSA pseudo-RBD, RBD and Parkinson's Disease (PD).

Aim: To report a clinical case involving OSA, RBD, pseudo-RBD, PD and to analyze the possible relationships between these syndromes.

Methods: Clinical follow-up and video polysomnography (vPSG) monitoring were performed.

Results: Male, 52 years old, with excessive daytime sleepiness, fatigue, nocturnal awakenings, with snoring and apnea witnessed for 22 years. In 2019, he had a polysomnography with an AHI of 23.7 events/hour (minimum saturation of 80%). He started tremors in right arm, difficulty walking, resting tremor, and being woken up by tremors when sleeping. He was diagnosed with Parkinson's disease and started Prolopa 100 mg/25mg every 8 hours. In 2020, he begins to have restless sleep, with aggressive events, aggressive vocalization, enactment of dreams (vivid and violent content), with difficulty to be aroused and confused when awakened at any time during the night. In 2022, Autoset CPAP therapy was

prescribed, with improved sleep, reduced fatigue and behavioral events during sleep, and also reduced tremors. He came to our sleep clinic in 2022 for follow-up, a v-PSG with CPAP was performed and showed AHI 12.4 events/ hour (04 Obstructive Apnea, 37 Central Apnea, 41 Central Hypopnea), tremor after awakenings, and REM without atonia. After 2 months, the patient again presented behavioral symptoms during sleep, and the CPAP prescription was optimized to a fixed pressure of 8.5 cmH₂O, with improvement of symptoms.

Conclusions: It is noted, in this clinical case, that the patient had a clinical presentation of motor behaviors during sleep in the presence of OSA, suggestive of OSA pseudo-RBD, and showed improvement with the start of CPAP therapy for OSA treatment. But he also has a RWA and PD, which is suggestive of RBD. The findings described allow us to conclude the coexistence of OSA pseudo-RBD and RBD, however more studies are necessary to understand the role of OSA pseudo-RBD as a predictor factor for RBD.

ID: 1473

Video-polysomnographic Findings of Psychotic Symptoms in the Presence of Selective GABA Receptor Agonist: A Case Report

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Keywords

- ▶ hallucination
- ▶ insomnia
- ▶ zolpidem
- ▶ adverse events

Introduction: Insomnia is the most common sleep disorder, with a worldwide prevalence ranging from 3.9% to 22.1%. It is defined as a persistent difficulty in sleep initiation, maintenance or consolidation that occurs despite the appropriate circumstances for sleep and daytime impairment. The pharmacological treatment is based on drugs that act on neural pathways that control the sleep-wake cycle, such as the selective GABA receptor agonists, known as the "Z-drugs." Zolpidem is one of these medications. In recent years, an increase in reports of adverse effects has been observed.

Aim: To report a video-polysomnographic case that demonstrates the findings of hallucinations related to the use of Z-drugs.

Methods: Anamnesis, physical examination and video-polysomnography.

Results: We describe a case of a 92-year-old female patient, referred to our sleep laboratory to perform a video-polysomnography (vPSG) exam, as part of an investigation of behavioral disorder as a prodromal phase of dementia with Lewy Bodies. She had complaints of recurrent hallucinations at night, with no report of functional or cognitive changes nor infectious conditions. On the night of the exam, she had normal sleep latency but a latter increased wake after sleep onset (WASO). On that occasion, her son offered 5 mg of Zolpidem, which she had been using for 4 years. About 16 minutes later, she reported visual and auditory hallucinations of unknown people, with well-defined faces, colorful clothes and friendly content that persisted for 47 minutes. While hallucinating, she had consciousness of the episode and

partial memory of the event. During the investigation, electroencephalogram, cranial tomography, laboratory examination, psychiatric and geriatric evaluations were performed, and no other causes of hallucinations were identified. The drug was discontinued, and the patient denied the return of hallucinations.

Conclusions: Most patients have mild effects from the use of Z-drugs, however some patients have greater effects with potential risks to their own health. Special care should be taken in elderly individuals, whose hepatic metabolism of the drug is slower, resulting in elevated serum concentrations. The psychotic symptoms induced by the Z-drugs are rarely reported and the vPSG recording is even rarer. With this report, we draw attention to adverse effects of the Z-drugs, a growing public health problem with hallucinations, falls, increased mortality, morbidity and healthcare costs.

ID: 1474

Correlation among Sleep Quality, Excessive Daytime Sleepiness, Respiratory Muscle Strength, and Lung Function in Post COVID-19 Patients

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Keywords

- ▶ COVID-19
- ▶ sleep quality
- ▶ respiratory function testing
- ▶ SARS-CoV-2
- ▶ sleep disorders

Introduction: SARS-CoV-2 infection carries a series of acute respiratory disorders. Despite the clinical improvement, some patients still present limitations at returning to their daily living and work. They can be explained by the wide range of systemic dysfunctions, as the disease's side effects, and may affect respiratory muscle strength, lung function and sleep quality.

Aim: To evaluate the correlation among sleep quality (SQ), excessive daytime sleepiness (EDS), respiratory muscle strength (RMS) and lung function (LF) in individuals with previous COVID-19.

Methods: Adult volunteers with age above 18 years old, both of sexes, who were tested positive for COVID-19 were recruited. They had their respiratory muscle strength (manovacuometry) and lung function (spirometry) evaluated. Sleep was assessed subjectively by self-reported Pittsburgh Sleep Quality Index (PSQI) and by the Epworth Sleepiness Scale (ESS) and objectively for 7 following nights using actigraphy (AT053, Condor Instruments Ltda).

Results: 15 participants were studied (20% male, age 43.7 ± 13.1 years, average time post-COVID-19 infection 13.1 ± 7.1 months). FEV1 2.62 ± 0.88 L (81.33 ± 14.83%), forced vital capacity (FVC) 3.4 ± 1.1 L (87.1 ± 13.7%) and FEV1/FVC 0.7 ± 0.12 (86.9 ± 15.6%). There was a negative moderate correlation between FVC and PSQI ($r = -0.647$; $p = 0.009$), between FEV1/FVC and sleep latency by PSQI ($r = -0.542$; $p = 0.037$). No correlation between EDS and lung function ($p = 0.806$) was found. Maximal inspiratory pressure was 8011 ± 30 cmH₂O (83.5 ± 28.9%). Poor sleep quality was reported (PSQI 9.13 ± 3.44), unlike excessive daytime sleepiness (7.53 ± 5.48).

Conclusions: Our findings show a correlation between lung function and sleep quality, given that lung function impairment induced by COVID-19 infection may affect important aspects of sleep quality.

ID: 1476

Incident and Progression of Coronary Calcium Score in Patients with Obstructive Sleep Apnea: The ELSA-Brazil Study

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Keywords

- ▶ atherosclerosis
- ▶ cardiovascular disease
- ▶ obstructive sleep apnea
- ▶ excessive daytime sleepiness

Introduction: Recent evidence suggests that symptomatic obstructive sleep apnea (OSA) phenotypes are particularly susceptible to cardiovascular events. The development of atherosclerosis is a plausible mechanism but the impact of OSA on atherosclerosis is unclear.

Aim: To assess the role of OSA and related clinical features on incidence and progression of coronary artery calcium (CAC) scores.

Methods: In the ELSA-Brazil, a prospective community-based cohort study, we performed a sleepiness questionnaire, actigraphy, and home sleep studies at baseline. CAC (64-slice multi-detector computed tomography) was measured at two different time points throughout the study (baseline, between 2010–2014, and follow-up, between 2016–2018). Incidence and progression of subclinical atherosclerosis (defined as baseline CAC = 0 followed by CAC > 0 at a 5-year follow-up visit; baseline CAC > 0 followed by a numerical increase in scores at follow-up, respectively). The association of these two CAC outcomes was assessed using logistic regression. Stratified analyses based on excessive daytime sleepiness (EDS) were performed.

Results: We analyzed 1,956 participants with available CAC scores at baseline (age: 49 ± 8 years; 57.9% women; 28.2% with OSA). We found a higher prevalence of CAC > 0 in OSA patients (31.3%) compared with those without OSA (19.0%; $p < 0.001$). In adjusted models, we did not find a significant association between OSA and prevalent CAC (OR = 0.92; 95% CI: 0.67–1.27; $p = 0.607$). However, in longitudinal analyses ($n = 1,247$, mean follow-up = 5.1 ± 0.9 years), we found a significant association between OSA and incidence of subclinical atherosclerosis among those reporting EDS after adjusting for covariates (OR = 1.90; 95% CI: 1.02–3.51; $p = 0.042$). Furthermore, analysis of CAC progression ($n = 319$) showed a positive association for both OSA (Beta = 1.084; 95% CI: 0.032–2.136; $p = 0.043$) and OSA with EDS (Beta = 1.651; 95% CI: 0.208–3.094; $p = 0.025$).

Conclusions: OSA, particularly with EDS, predicts the incidence and progression of CAC. These results provided biological plausibility for the higher cardiovascular risk observed in excessively sleepy patients.

ID: 1477

The Role of Obesity in the Sleep Phenotype of Sleep Disorders in Youth with Prader–Willi Syndrome Based on Polysomnographic Analysis of Respiratory Events

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Keywords

- ▶ Prader–Willi syndrome
- ▶ obstructive sleep apnea
- ▶ obesity
- ▶ child
- ▶ polysomnography

Introduction: Prader–Willi syndrome (PWS) is a rare neuroendocrine disorder characterized by early hypotonia and feeding difficulties, developmental delays, endocrinopathies and behavioral concerns, especially rigidity, anxiety, and behavioral outbursts. PWS is also characterized by decreased resting energy expenditure and transition to hyperphagia and obesity. Sleep disorders are common findings in PWS, including excessive daytime sleepiness, narcolepsy-like symptoms, obstructive sleep apnea and hypoventilation. Although hypoventilation is a common finding in PWS, the role of obesity is still unclear.

Aim: To compare sleep ventilation profiles in obese and non-obese children and adolescents with PWS.

Methods: Single night type 1 polysomnographic evaluation of children with PWS with regular clinical evaluation at a tertiary care facility. We performed a paired analysis comparing polysomnographic measures of obese and non-obese groups. Body mass index (BMI), BMI z-score, sleep efficiency and stages, apnea–hypopnea index (AHI), and oxygen saturation nadir values were longitudinally analyzed. Results are expressed as mean values and standard deviations (\pm SD). p values < 0.05 were considered statistically significant.

Results: We included 92 patients with available paired data. The median age was 9 years (range 0–24 years) and BMI was 33.2 ± 9.8 in the obese group and 19.7 ± 3.9 in the non-obese group. BMI z-score was 4.6 ± 3.3 in the obese group and 0.6 ± 1.0 in the non-obese group. There was a higher AHI (mean obesity = 10.9 ± 15.6 versus mean non-obesity = 4.4 ± 3.6 ; $t = 3.08$, $p = 0.002$) and total sleep time spent with oxygen saturation (SO₂) below 90% (mean obesity = 50.9 ± 95.9 versus mean non-obesity = 8.6 ± 23.8 ; $t = 3.27$, $p = 0.001$) in obese group. The mean oxygen saturation (mean obesity = 92.2 ± 4.1 versus mean non-obesity = 94.3 ± 1.7 ; $t = 3.34$, $p = 0.001$) was significantly lower in obese group. No differences were observed for lowest oxygen saturation (SO₂ nadir), sleep stage, wake time after sleep onset and sleep efficiency.

Conclusions: Patients with PWS and obesity demonstrated significantly higher rates of respiratory events and worse oxygenation than those without obesity. The link between sleep and obesity in the PWS may due to energy imbalance from increased sedentary behavior. Further studies are needed to describe the phenotype of sleep in PWS.

ID: 1479

Dietary Practices, Physical Activity, and Sleep Habits in Adults during the COVID-19

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Keywords

- ▶ diet
- ▶ sars-CoV-2
- ▶ exercise

Introduction: The COVID-19 pandemic drastically impacted the population's life routine, healthy habits such as physical exercise, food and sleep quality were impacted due to social isolation measures.

Aim: To assess the impacts of the COVID-19 pandemic to eating habits, physical exercise practices and sleep perceptions.

Methods: Data were collected from June to August 2020, through an online form containing information on behavior, physical exercise, eating habits and sleep. Descriptive analysis of mean, median and standard deviation were performed for continuous variables and frequency for categorical variables. Chi-square tests were performed for association between qualitative variables and multinomial regression tests for association between variables of interest. The significance level adopted was $p < 0.05$.

Results: The study consisted of a sample of 189 individuals with a median age of 31 (IC95% = 32.2–35.4) years, 77.8% were female and had an average monthly income of 2–5 minimum wages (20.1%). Regarding health habits during the pandemic, 60.3% reported practicing some type of physical activity, 38.1% reported not having changed their dietary pattern and 35% considered their sleep quality to be very good. Sleep time was 8.30 (IC95% = 8.22–8.57) hours during the period of social isolation. Among individuals who considered having more time to take care of their health during the period of social isolation, ~35.2% ($\chi^2 = 6.51$; $p = 0.039$) reported having improved their diet during this period and 68.5% ($\chi^2 = 7.08$; $p = 0.008$) were practicing physical activity. On the other hand, individuals who reported not having enough time to take care of their health were 3.68 (1.4–9.6; $p = 0.008$) more likely to have a sleep quality considered very bad, in addition, bad mood positively affected the worsening of sleep quality [9.89(2.11–46.3; $p = 0.004$)].

Conclusions: The results of this study emphasize that, despite the negative impacts of social distancing, the fact that individuals spend more time at home positively affected health practices, due to the greater time available to take care of their health.

ID: 1480

Metabolomic Approach for Obstructive Sleep Apnea in Adults: A Systematic Review

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Keywords

- ▶ obstructive sleep apnea
- ▶ adults
- ▶ metabolomic

Introduction: Obstructive Sleep Apnea (OSA) corresponds to episodes of complete or partial upper airway obstruction during sleep. The gold standard for diagnosing OSA is polysomnography; however, metabolomics is an innovative and highly sensitive method that seeks to identify and quantify small molecules in biological systems.

Aim: Identify the metabolites most frequently associated with obstructive sleep apnea in adults.

Methods: The search for articles was conducted between October 2020 and August 2021, in electronic databases MEDLINE/PubMed, SciELO, Embase, and Cochrane, through the combination of descriptors: obstructive sleep apnea, metabolomic, adult. This systematic review included all cross-sectional studies published, including human patients aged 18 years or older, of both genders who underwent type I or II polysomnography and metabolomics study.

Results: The search strategy selected 3697 surveys, and 4 of them were selected to be a part of this systematic review. Based on the analyzed surveys, it was found that all of them were able to diagnose OSA, reaching a sensitivity of 75 to 97%, and specificity that ranged from 72 to 100%; besides differentiating patients with OSA (severe, moderate and mild) from simple snorers with a mean sensitivity of 77.2% and specificity of 66.25%.

Conclusions: These findings suggest that, in addition to being used as a screening and diagnostic strategy for OSA, metabolomics has the potential to be used for severity stratification and to monitor the disease's progression.

ID: 1481

Real World Evidence of a Multicomponent CBTi Program with Chatbot and AI on Reducing Anxiety and Depressive Symptoms

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Keywords

- ▶ depression
- ▶ mental health
- ▶ digital therapeutics
- ▶ cognitive-behavioral therapy for insomnia (CBTi)

Introduction: The co-occurrence of insomnia with anxiety and depression is prevalent and well observed in the general population. The gold-standard treatment for insomnia, Cognitive-Behavioral Therapy for Insomnia (CBTi), has been shown to ameliorate such symptoms, applied by a therapist or in digital formats. However, few digital solutions have been described with real-world data,

and particularly testing the extent at which they might improve anxiety or depression.

Aim: Our goal was to describe therapeutic response and changes in anxiety and depressive symptomatology after a multicomponent digital program developed by Vigilantes do Sono (Sleep Watchers) using chatbot and Artificial Intelligence (AI).

Methods: A virtual assistant interacts with users daily, for 5–10 minutes during ~7 weeks, asking them to complete diaries and delivering CBTi knowledge pills in ~45 sessions, distributed in seven modules. The Insomnia Severity Index (ISI), the General Anxiety Disorder (GAD-2) and the Patient Health Questionnaire (PHQ-2) are used before and after the modules of the program. Anxiety and depressive symptomatology were defined by scores ≥ 3 in GAD-2 and PHQ-2, respectively. Participants (18+ years) were recruited through social media, organic search, or referred by health-care professionals, from February/2021 to August/2022. All of them electronically signed an informed consent.

Results: A total of 1.447 participants (69% women, mean age 41.1 ± 12.7) had insomnia (ISI > 7) and fulfilled the GAD-2 and the PHQ-2 at least twice, of whom 76% ($n = 1.100$) and 63% ($n = 916$) scored positively (≥ 3) for anxiety and depressive symptomatology, respectively. The correlations between baseline values of the ISI with both GAD-2 ($\rho = 0.44$; $p < 0.001$) and PHQ-2 ($\rho = 0.44$; $p < 0.001$) were significant, as well as the correlation between them ($\rho = 0.56$; $p < 0.001$). Modules 2, 3, 4, 5, 6, and 7 were completed by 66%, 53%, 45%, 38%, 32%, and 26% of participants, respectively, of whom 52%, 55%, 59%, 61%, 63%, and 66% reached either therapeutic response (ISI reduction > 7) or insomnia remission (ISI < 7). Among those who scored positively on GAD-2 and PHQ-2, 38% and 44% had a score reduction of at least 3 points or 50%, respectively. These rates increased to 57% and 60% for individuals who completed all modules.

Conclusions: The findings support the efficacy of the program in reducing anxiety and depressive symptomatology and reinforce the use of AI in optimizing this new therapeutic modality.

ID: 1483

Challenge of Continuous Positive Airway Pressure Therapy Adaptation: A Case Report

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Keywords

- ▶ obstructive sleep apnea
- ▶ continuous positive airway pressure

Introduction: Despite the technological development in the last years, the adaptation of continuous positive airway pressure (CPAP) therapy continues to pose difficulty in many cases for the treatment of obstructive sleep apnea (OSA).

Aim: To report a case of difficult adaptation of CPAP in a patient using oronasal mask interface.

Methods: Clinical and demographic data were collected in the patient's medical chart; the patient agreed to have his case reported.

Results: A 66 years-old male patient with polycythemia secondary to a severe obstructive apnea (apnea-hypopnea index [AHI] of 57.4 per hour) presented with persistent symptoms of excessive daytime sleepiness and high residual

AHI, despite initiation of CPAP therapy with nasal mask. The symptoms deprived his ability to work, as he utilized a chainsaw in his job. Complaints of oral air leakage in the middle of the night were, leading to maladaptation and did not ameliorate despite the use of chinstrap. Oronasal interface was successful in improving patient's adherence, but yet he continued to suffer with the initial complaints. Increase in therapeutic pressure did not result in a better control, even with a trial of higher levels using a bi-level ventilator. AHI reported by the CPAP algorithm widely varied over the nights, with mean residual levels of 15–20/hour (mainly obstructive events). Polysomnography CPAP titration was not available. Patient denied intermittent use of alcohol or any medicine that could interfere with OSA. He used to sleep in a hammock, in semi-lateral decubitus position. Eventually, after a throughout evaluation, the healthcare team noticed that, to avoid even minimal air leak of the mask, patient used to force the bottom strap of his mask as much as possible, which probably was contributing to tongue drop during sleep and to worsen the obstructive events. After orientation to a permissive – but controlled – air leak of the mask, patient evolved with improved control of AHI and his symptoms.

Conclusions: Adaptation of CPAP represents yet a challenge for clinicians. Mask interface and adaptation parameters must be selected depending on individual aspect of patients in treatment. Although nasal mask is usually considered the first one interface choice, oronasal may be better for some cases. Special attention to details of the flow generator, trachea and mask interface is imperative, particularly when treating patients with difficulty in adaptation.

ID: 1485

A Higher Eating Time was Positively Associated with Habitual Energy Intake in Sedentary Adults

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Keywords

- ▶ energy intake
- ▶ eating period
- ▶ social jetlag
- ▶ sleep

Introduction: Recent studies have shown that the available period for eating is a positive predictor of habitual energy intake, which may lead to weight gain and obesity.

Aim: To verify if the time available to eat, social jetlag, and sleep efficiency are associated with higher habitual energy intake in sedentary adults.

Methods: This is a cross-sectional study whose data collection occurred in a school-related hospital in São Paulo/Brazil from April to September 2021. The average calories evaluated the habitual energy intake from two 24-hour food recalls (R24h). The time available to eat was determined by the average time between the first and last meals in the two R24h. Sleep efficiency was assessed using the Pittsburgh questionnaire. Social jetlag was established by the difference in hours of sleep and wakefulness on free and working days, acquired from a sleep diary of 14 consecutive days. A multiple linear regression model was elaborated from the hypotheses established *a priori*. The variables were inserted into the

statistical model based on biological plausibility, *p* value < 0.20, multicollinearity, tolerance, Akaike information criterion, and *r*². The habitual energy intake was the dependent variable, while the time available to eat, social jetlag, and sleep efficiency were independent variables. Age, sex, and socioeconomic level are co-variables. The Research Ethics Committee approved the work of the University (No. #0910/2020).

Results: The sample size calculation was performed a posteriori, resulting in a sampling power of 0.91. Forty-two participants (22 men and 20 women; 34.5 ± 12.5 years old; BMI 25.6 ± 5.21 kg/m²) composed the sample. The linear regression model explained 40% habitual energy intake variability (*R*² = 0.40; *p* < 0.021). Time to eat (*B* = 101.91 kcal; *p* = 0.018) was positively associated with habitual energy intake. However, social jetlag (*B* = -87.86 kcal; *p* = 0.374) and sleep efficiency (*B* = -4.54 kcal; *p* = 0.60) were not significantly associated with habitual energy intake.

Conclusions: It can be concluded that there is an association between a longer feeding period and higher habitual energy intake. Therefore, considering a dietary strategy that limits this daily food window may be interesting in the context of obesity.

ID: 1486

Continuous Positive Airway Pressure Therapy Maladaptation in Patients with Submucosal Palatal Cleft: Report of Two Cases

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Keywords

- ▶ obstructive sleep apnea
- ▶ CPAP

Introduction: Continuous positive airway pressure (CPAP) therapy is considered the gold-standard treatment of the obstructive sleep apnea (OSA). Despite being the first choice of treatment, adherence to the pressure therapy is yet challenging in many cases. For some patients, anatomical variations and abnormalities pose further difficulty to adaptation.

Aim: To report two cases of difficult adaptation of CPAP in patients with submucosal palatine cleft.

Methods: Clinical and demographic data were collected in the patients' medical chart; they agreed to have their case reported.

Results: Case 1: A 61 years-old female patient with moderate OSA (apnea-hypopnea index [AHI] of 23/h) in use of CPAP with nasal mask interface presenting with excessive oral air leak and awakenings due to intense dried mouth, even using chinstrap. Case 2: An over-weighted asthmatic 47 years old female also in use of CPAP with nasal mask interface due to moderate OSA (AHI of 25/h), with chief complaint of episodes of sleep awakenings due to oral air leak and sensation of suffocation. Despite optimal management of equipment adaptation measures, both of them maintained presenting symptoms. CPAP's algorithm demonstrated excessive air leak and relative poor control of obstructive events. Trials of increase in therapeutic pressure led to rise in estimated air leak and worsening of complaints. Side lying sleeping did not contributed to better control of the AHI. Detailed evaluation of the upper airway of both patients, including nasopharyngeal endoscopy, palate palpation and dynamic oroscopy revealed minor bone failure in posterior

palate, which was not related with palatal veil insufficiency but probably could contribute to the nighttime symptoms. Sleep endoscopy was not available to confirm the theory, but examination findings suggested that both patients may have the diagnosis of palatal prolapse.

Conclusions: Specific upper airway anatomical abnormalities may lead to difficulty in adaptation of CPAP therapy. Submucosal palatine cleft is related to excessive “free” soft tissue in retropalatal region and, when using therapeutic positive pressure upon airway, may lead to palatal prolapse to rhinopharynx during expiration and ultimately to flux limitation to the nose. Detailed evaluation of the patients' upper airway is critical to manage cases of maladaptation of pressure therapy. Alternative treatments to CPAP must be evaluated to control OSA in these patients.

ID: 1488

Effect of CPAP on Atrial Remodeling and Diastolic Dysfunction of Patients with OSA and Metabolic Syndrome: A Randomized Study

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Keywords

- ▶ continuous positive airway pressure
- ▶ sleep apnea
- ▶ metabolic syndrome
- ▶ randomized controlled trial
- ▶ diastolic dysfunction

Introduction: Metabolic Syndrome (MS) is associated with heart remodeling and diastolic dysfunction. Considering that Obstructive Sleep Apnea (OSA) is common in patients with MS and its treatment may reverse MS, it would be important to evaluate the role of OSA treatment on diastolic dysfunction in patients with MS.

Aim: To evaluate the role of OSA treatment on heart remodeling and diastolic dysfunction in patients with MS.

Methods: This study is a prespecified analysis of a randomized placebo-controlled trial that enrolled patients with a recent diagnosis of MS, and moderate/severe OSA to undergo continuous positive airway pressure (CPAP) or nasal strips (placebo) for 6 months. Patients were invited to perform a transthoracic echocardiogram using standard recommendations by a single investigator without access to the sleep studies/treatments.

Results: Ninety-nine patients (79% men; age: 48 ± 9 years; body mass index: 33 ± 4 kg/m²) completed the study. At follow-up, in the placebo group, patients had a significant increase in atrial diameter: from 39.5 [37.0–43.0] mm to 40.5 [39.0–44.8] mm ($p=0.03$). CPAP prevented atrial enlargement. In patients with diastolic dysfunction at baseline, almost half of them had diastolic dysfunction reversibility with CPAP (in comparison with only 2 patients in the placebo group, $p=0.039$). In the regression analysis, the chance of

diastolic dysfunction reversibility by CPAP was 6.8 fold (CI: 1.48–50.26, $p=0.025$).

Conclusions: In patients with MS and OSA, 6-months of CPAP therapy prevented atrial remodeling and increased the chance of diastolic dysfunction reversibility.

ID: 1489

Sleep Quality, Daytime Sleepiness, and Risk for Generalized Anxiety Disorder in a Public University in the Western Amazon during the COVID-19 Pandemic

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Keywords

- ▶ sleep
- ▶ sleep quality
- ▶ COVID-19
- ▶ anxiety

Introduction: Sleep deprivation is a chronic issue in the modern societies. The COVID-19 pandemic might have impacted on sleep quality and psychiatric disorders, such as anxiety.

Aim: We aimed to investigate the associations between sleep quality, daytime sleepiness, and risk for generalized anxiety disorder (GAD) in an academic community in the context of remote, online education during the COVID-19 pandemic.

Method: This was a cross-sectional, exploratory study. Online questionnaires were applied to adult students, teachers, and administrative personnel of the public university of the Rondônia state from September, 2021 to December, 2021. This period was characterized by an exclusive online education. Sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI); poor sleep quality was considered when the score was > 5. Daytime sleepiness was measured by the Epworth Sleepiness Scale (ESS); excessive sleepiness was considered in the presence of a score ≥ 10. The risk for GAD was determined by the Generalized Anxiety Disorder 2-item (GAD-2); a score ≥ 3 indicated high risk for GAD. Associations between GAD risk, sleep quality, and daytime sleepiness were assessed by the chi square test.

Results: We analyzed 200 individuals (30 ± 11.4, 68.3% female, 87.9% students, 8.6% teachers, 3.5% administrative personnel). A high risk for GAD was detected in 96 (48.0%) participants. Poor sleep quality was more frequently reported by participants with higher GAD-2 score (88.3% vs 55.8% in those with lower score, OR 5.93, 95% CI 2.74–13.81, $p < 0.001$). Excessive daytime sleepiness was also more common in individuals with higher than lower chance of GAD (52.1% vs 34.6%, respectively, OR 2.05, 95% CI 1.12–3.78, $p=0.019$).

Conclusions: Poor sleep quality, excessive daytime sleepiness, and high risk for GAD were common among an academic community during the COVID-19. Sleep disturbance and daytime sleepiness were strongly associated with generalized anxiety.

ID: 1490**The Impact of Obstructive Sleep Apnea on the Day-night Pattern of Paroxysmal Atrial Fibrillation**C. M. Goes¹, L. F. Drager², G. Lorenzi²¹Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil²Universidade de São Paulo, São Paulo, SP, Brazil**Keywords**

- ▶ obstructive sleep apnea
- ▶ paroxysmal atrial fibrillation

Introduction: Atrial fibrillation (AF) is the most prevalent cardiac arrhythmia, with significant morbidity and mortality. Recent evidence indicates that obstructive sleep apnea (OSA) is associated with a higher occurrence and recurrence of AF. However, it is not clear the prevalence of OSA and the potential relevance of this sleep disorder in modulating the day - night pattern of occurrence of one of the relevant forms of AF, the so-called Paroxysmal AF (PAF), within 24 hours. Thus, the aim of this study is to assess the prevalence of OSA in patients with FAP and to compare the period of occurrence of FAP in patients with and without OSA. Our hypothesis is that patients with OSA would have a higher frequency of at least one episode of FAP during sleep than patients without OSA.

Aim: The aim of this study is to assess the prevalence of OSA in patients with FAP and to compare the period of occurrence of FAP in patients with and without OSA. Our hypothesis is that patients with OSA would have a higher frequency of at least one episode of FAP during sleep than patients without OSA.

Methods: We recruited consecutive patients who underwent 24-hour electrocardiographic monitoring (Holter) and showed at least one episode of PAF within 24 hours. Regardless of sleep-related signs and symptoms and Holter data, all FAP patients were asked to undergo a clinical assessment that included demographic data and anthropometric measurements. For objective sleep assessment, we performed portable monitoring using the validated Watch-PATM device. OSA was defined as an apnea-hypopnea index ≥ 15 events per hour.

Results: We studied 101 patients (mean age: 62.6 ± 10 years, 57.4% men, body mass index: 29 ± 5 kg/m²). The frequency of OSA was 55.4% (56 patients). None of them had a previous diagnosis of OSA and therefore did not undergo specific treatment. Regarding the time of occurrence of PAF episodes, divided into wakefulness, sleep and both periods, we did not observe differences between the groups with and without OSA: wakefulness: 19 vs 50%, sleep: 11 vs 6; both periods: 26 vs 16%, respectively (all $p > 0.05$ values). We also did not observe differences in the number of FAP

episodes and in the duration of these episodes in the comparison between the two groups.

Conclusions: This analysis suggests that OSA is common in patients with FAP but is not associated with an increased occurrence of overnight FAP episodes.

ID: 1494**Profile of Respiratory Muscle Strength in Resistant Hypertensive Patients with Obstructive Sleep Apnea**

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Keywords

- ▶ obstructive sleep apnea
- ▶ respiratory muscle strength
- ▶ resistant arterial hypertension

Introduction: Resistant arterial hypertension (RAH) is defined by the finding of casual blood pressure values in the office persistently above the control goals in a patient using at least three classes of antihypertensive drugs. The obstructive sleep apnea (OSA) is characterized by recurrent episodes of partial or complete upper airway obstruction during sleep. During episodes of airway obstruction and hypopneas during sleep, the respiratory muscles may present with abnormalities due to repeated efforts during breathing.

Aim: To determine the profile of respiratory muscle strength in resistant hypertensive patients with obstructive sleep apnea.

Methods: This is a randomized clinical study, in which a cohort of RAH diagnosed by the Arterial Hypertension Program with OSA and AHI > 15 by polysomnography in a University Hospital was evaluated. muscle inspiratory pressure (MIP) and expiratory (MEP) measurements were performed using an analog manocacuumeter, which reflects respiratory muscle strength. MIP and MEP measurements were performed according to the American Thoracic Society (ATS). All patients agreed and signed the Free and Informed Consent Term, with a protocol approved by the Ethics and Research Committee of the Institution.

Results: Ninety-four patients (41 men/53 women), aged 61.1 ± 7.8 years and body mass index of 32.8 ± 5.1 kg/m² were evaluated. For both procedures, five measurements were performed and the one with the highest value was selected. The mean of the measured values of MIP. was 48.9 ± 23.6 , and MEP was 66.6 ± 32.9 .

Conclusions: In the evaluated sample, the MIP and MEP values were below the reference values, indicating a decrease in respiratory muscle strength in this population.