poor. Surprisingly, during the COVID-19 pandemic, HCW with supplementary work did not exhibit poorer sleep hygiene. Specifically, HCW with COVID-19 related supplementary work did not exhibit poorer sleep hygiene. Poorer sleep hygiene was observed in the offspring of HCW without supplementary work and without COVID-19 related work. A wider sample size could improve outcome fiability.

IMPACT OF SLEEP DISTURBANCES IN JUVENILE FIBROMYALGIA SYNDROME

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Introduction: Sleep disturbances are a well-known part of the clinical spectrum of fibromyalgia (FM), a disabling condition characterized by musculoskeletal pain, fatigue, mood disturbances and many other symptoms that impact greatly the patients' quality of life. In contrast to adults, Juvenile Fibromyalgia Syndrome (JFS) has been investigated less extensively from the sleep viewpoint.

Materials and methods: Rheumatologic symptoms' severity, neuropsychiatric features, and sleep characteristics of a sample of 25 consecutive outpatients with JFS aged 12-19 years were assessed using both objective and subjective validated scores. Objective sleep parameters were evaluated using polysomnography. Moreover, we investigated the distribution of N3 during the night calculating the "N3 distribution index" defined as ([number of epochs of N3 in the first half of SPT – number of epochs of N3 in the second half of the SPT]/total number of N3 epochs). All these variables were also extracted from a population of 27 age-matched control subjects. Mann-Whitney U test was used for comparison of quantitative data; non-parametric Spearman's correlation coefficient was used for correlations analysis; multiple regression models for different outcomes were finally performed.

Results: Nonrestorative sleep was reported by nearly all patients. Polysomnographic variables were compared between JFS patients and control group. JFS patients showed a significant longer Sleep Period Time (p=0.004) and an increased wake time after sleep onset (p=0.026) compared to healthy peers. No differences in sleep efficiency, number of arousals and sleep latency were found between the two populations. Although the time spent in N3 sleep stage did not differ between patients and control group, the N3 distribution index was significantly lower in JFS patients than in the control group (p=0.018), indicating a more pronounced distribution of N3 sleep during the second part of the night. Subjective poor sleep quality and daytime sleepiness were related to bodily distribution of pain, increased symptom severity scale, depressive symptoms, fatigue and symptoms severity upon awakening. Reduced N3 sleep stage was related to symptoms' severity and depressive symptoms. Finally, the N3 distribution index correlated to depressive symptoms and irritability. Based on the results of multiple regression analyses, pain distribution was predicted by subjective poor sleep quality (β= -0.322, p=0.035), whereas depressive symptoms were predicted by both subjective poor sleep quality (β= -0.317, p= 0.04) and objective PSG measures (N3 min: β= -0.065, p=0.032).

Conclusions: This study confirms that sleep complaints and sleep alterations are a key hallmark of JFS and provides important insights on the impact of sleep disturbances on other relevant clinical domains of the disease, such as pain and depression. However, despite patients' poor subjective sleep assessment, objective sleep macrostructure is preserved when compared to healthy subjects and only few polysomnographic variables are significantly different; more specifically, N3 sleep distribution is significantly altered in JFS patients, with a higher representation during the second part of the night, thus suggesting an impairment in the physiological release process of homeostatic drive to sleep. This last phenomenon may also explain the non-restorative sleep sensation complained by patients upon awakening.

INTERACTIONS BETWEEN SLEEP AND GUT BACTERIA IN HEALTHY DEVELOPING INFANTS

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Introduction: Healthy infant development is driven by the maturation of different physiological processes. Two crucial processes are the establishment of sleep rhythms and the growth of a complex holobiontic ecosystem with gut bacteria. Studies have shown a bi-directional link between sleep and gut bacteria in animal models and human adults. However, no study has investigated how these two processes are linked in the first year of life nor how they contribute to healthy behavioral development.

Materials and Methods: We quantified habitual sleep (actigraphy-derived sleep composites Sleep Day, Sleep Night, Sleep Timing, Sleep Variability, and Sleep Activity), gut bacteria markers (16S rRNA gene profiling for computing bacterial diversity, enterotype, and bacterial maturation index), and behavioral development (Ages and Stages Questionnaire) in 162 infants at 3, 6 and 12 months of age. With multilevel and regression models we analyzed links between habitual sleep and gut bacteria, with random intercept cross-lagged panel models we evaluated interactions with behavioral developmental outcomes. Furthermore, in a subset of 32 6-months-old infants, we collected high-density EEG data during the first 2-h of nighttime sleep to quantify slow-wave activity, theta power, and sigma power.

Results: We found evidence of a sleep-gut link: daytime sleep (Sleep Day) was negatively linked to gut bacteria diversity (p = 0.02), and nighttime sleep fragmentation (Sleep Activity) was positively linked to bacterial maturation index (p = 0.03) and enterotype (p = 0.048). Sleep Variability was linked to enterotype patterns (p = 0.02). We also found evidence of a sleep-brain-gut link: The two enterotypes differed in slow-wave activity (p = 0.02).

Lastly, we found associations between both gut bacteria and habitual sleep and behavioral development both at the same age and predictive for later ages. General patterns revealed that habitual sleep was associated more strongly with personal-social development, with daytime sleep showing most associations. Gut bacteria were associated mainly with gross motor development, with bacterial diversity showing most associations.

Conclusions: We find novel evidence for a sleep-brain-gut link in infants that is relevant for behavioral development. This research provides sleep and gut bacteria targets as fundamental anchors for non-invasive modification to promote healthy development. Considering that many adult diseases root in early childhood, early interventions can improve lifelong health.

LESSONS FROM THE COVID-19 SHUTDOWN: THE WAITLIST CHALLENGE & INSIGHTS IN OVERMEDICATION PATHWAYS

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Introduction: With exponentially increasing waitlists for sub-specialty services, the COVID-19 pandemic is magnifying existing gaps in service delivery and illuminating crucial challenges, which need to be revisited — one of the affected domains being sleep/wake-medicine. As such, we aimed to: (1) characterize patient load of a sleep/wake-behaviour clinic located in a child/adolescent psychiatry before and during the pandemic, (2) identify risk-factors, which could be targeted at the referral level, and (3) understand the needs of children and parents', and offer more individualized support.

Materials and Methods: In a quality improvement project, five 35+ hour weeks of ambulatory one-to-one service delivery for children and adolescents with neurodevelopmental and -psychiatric disorders (aged 2-19 years), prior to- and during the clinical shutdown were analyzed for: (a) the documented amount of time required for new and follow-up assessments, and (b) risk-factors requiring in-person/phone follow-up assessments. After implementing a restructured intake process with qualitative exploratory- and quantitative validated questionnaires, we revisited clinical care via virtual home visits, and assessed medication strategies implemented by sub-specialists in the community.

Results: Before COVID-19, 81 patient encounters scheduled over five weeks required on average 2.4 hours (165 hours in 24 workdays; without time allocation for breaks, additional administrational tasks and CME events). 18/81 patients were 'red-flagged' (defined as 911-call eligible at any clinical worsening, needing on average 2-3x more allocated time per patient). After implementing the revised intake and triage: (a) The number of red-flagged patients increased by 79%; (b) 108 patient encounters (+33%) were conducted via Telehealth (incl. short follow-ups by ad hoc phone calls); (c) preparation and assessment time was reduced by a third; new patient encounters increased by 60% and follow-ups were reduced by 32%. Further, we analyzed medication strategies in 41 consecutive patients. 81% had been medicated for disorders of initiating and maintaining sleep (39/41) and sleep/wake-transition disorders (37/41). In 17/41 (41%) patients, medications for initiating sleep (e.g. melatonin) were often used in combination with other sleep medications (e.g., clonidine; with up to a maximum of 6 medications) and psychotropics (stimulants: 24%; SSRIs: 22%; antipsychotics: 15%). 24/41 (59%) patients were subject to polypharmacy. Among symptomatic patients, only 3/40 and 1/22 patients with symptoms of RLS-induced insomnia and SDB were on iron supplementation and a nasal spray, respectively.

Conclusions: Regarding patient care, the QIQA-project helped us to revisit service delivery and change clinical processes, which resulted in a reduction of preparation/assessment time and allowed for the timely identification of at-risk patients. The new triage concept also allowed us to make evidence-based first line treatment recommendations during the wait time, before the assessment. Further, several main themes were identified and extracted in this QIQA-project: (1) *unsuccessful treatment of intractable chronic insomnia,* despite multiple therapeutic attempts that often build on off-label medication trials, (2) *lacking implementation of first line therapeutic measures,* and (3) *compromised family coping skills*, affecting adherence to suggested non-pharmacological interventions, ultimately resulting in further medication trials.

LINKS BETWEEN PARENTAL EDUCATION, INFANT NIGHTTIME SLEEP DURATION, AND PARENTAL CONFIDENCE IN MANAGING INFANT SLEEP

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Introduction: Parental confidence has been linked to improved child outcomes, as well as better overall parental health and wellbeing. The determinants of parental confidence in the context of their infants' sleep are not well understood. This study aimed to examine the associations between parental confidence and sleep among parents of infants who use a commercially available video sleep monitor and an associated mobile sleep health application.

Materials and Methods: This study was approved by the Institutional Review Board of New York State Psychiatric Institute (NYSPI). Parents of 576 US infants (age 9.13±1.8 months, 49.6% male) were recruited for this study from the active customer base of Nanit sleep monitoring system. The Nanit system, a commercially available auto-videosomnographic device, includes a personalized, data-driven app that assists parents in understanding their infant's sleep health and offers tips and recommendations for improved sleep health. Parents were asked to complete the The Brief Infant Sleep Questionnaire-Revised (BISQ-R) and demographic questions via RedCap (75.8% mothers, 23.6% fathers, 0.5% other). The BISQ-R includes parent-reported sleep metrics, a Likert-scale question about the parent's self-reported confidence in dealing with their infant's sleep as well as a question asking whether they perceive their infant's sleep as a problem.

Results: The majority (87%) of parents reported that they were very confident or somewhat confident in managing their infant's sleep and only 17.2% reported they perceived their infant as having a sleep problem.- Parents reported their infant's average nighttime total sleep time (nighttime TST) was10.68±1.26 hrs and their infant's average bedtime was 7:30pm±0.86 hr. Infants' nighttime TST differed by parents' education level, wherein infants of parents with a high school education slept significantly less (10.1±1.7hrs) than infants of parents with some college or a college degree (10.7±1.7 hrs, p=0.003) and infants of parents with a graduate level education (10.7±1.7 hrs, p= 0.001). There were no significant differences in parental confidence or parental perception of their infants having a sleep problem among parents with different education levels.

Conclusions: Our findings demonstrate that parents with access to the personalized sleep health information provided by the Nanit sleep system reported being confident in managing their infants' sleep. Infants of parents with college or graduate level education had longer nighttime TST than infants of parents with a high school education.Parental education was not significantly associated with their confidence in managing their infant's sleep.Future studies should include additional socio ecological factors to further examine influences on infants' sleep health. Additionally, further work will aim to determine the influence of the Nanit system on parental confidence considering the higher levels reported in this sample than have been reported previously in a similar sample.

LONGITUDINAL ASSESSMENT OF SLEEP STRUCTURE AND EXECUTIVE FUNCTIONS IN TYPICALLY DEVELOPING CHILDREN AND DRUG-NAÏVE CHILDREN DIAGNOSED WITH ADHD

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Introduction: Sleep problems, sleep-wake instability and impaired cognitive functioning are common in children diagnosed with attention deficit hyperactivity disorder (ADHD). Research findings, primarily from cross-sectional studies, are inconclusive regarding ADHD-related differences in sleep macrostructure. The age-related changes in sleep organization in children with ADHD, as well as longitudinal association of sleep and executive functioning, have not yet been investigated. Here we present data from the longitudinal study of the maturational trajectories of sleep architecture and cognitive functions in drug-naïve children diagnosed with ADHD and typically developing children followed from about 12 to 14 years, age range of most rapid developmental electroencephalogram changes.

Materials and Methods: Nine ADHD children (combined presentation, DSM-V criteria, mean age 12.39±0.61 years at the first measurement) without any additional comorbid condition or sleep-disordered breathing problem, and nine typically developing controls (12.07±0.35 years) were recruited. There were no major differences in overall cognitive performance between the two groups. All subjects underwent an adaptation night and all night polysomnography (PSG) twice yearly at the Laboratory. Actigraphy devices/sleep diaries documented sleep-wake schedules. Executive functioning was assessed by the Comprehensive Executive Function Inventory (CEFI, parent form). Data from 4 recording time-points were