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ASSOCIATIONS BETWEEN DIET AND SLEEP HEALTH IN THE UK BIOBANK STUDY

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Introduction: It is well known that the prevalence of clinical and sub-clinical sleep issues is quite high, with a great economic and social burden on the society. As it is expected that the numbers of people suffering from clinical and subclinical sleep problems will increase in the coming years, new primary and/or complementary methods to improve and prevent poor sleep health across the population are urgently needed. In the current study, we aimed to conduct the largest investigation of diet and sleep health to date, through systematically examining the UK Biobank (UKB) data to find out whether diet quality and food groups play a role on sleep health.

Methods: This cross-sectional population-based study involved 502,494 participants. UKB food frequency and sleep questionnaires at baseline were used. Also, healthy diet, healthy sleep, and partial fibre intake scores were created. ANCOVA and regression models were used to examine the associations of healthy diet and dietary fibre intake scores with sleep health. Adjusted models included age, sex, BMI, and mental health symptomatology.

Results: We showed that both healthy diet and high partial fibre intake scores were associated with increased healthy sleep scores. Also, higher intakes of vegetables, fruits, fish, and unprocessed red meat were found to be associated with increased healthy sleep scores. On the other hand, processed meat intake was inversely associated with sleep health.

Conclusion: A healthy dietary pattern, and food groups (vegetables, fruits, fish, water) and nutrients (fibre) that are consumed as a part of a healthy dietary pattern were associated with better sleep health. Further work is needed to identify underlying mechanisms behind the impact of diet on sleep health.

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SLEEP AMONG YOUTH DURING THE COVID-19 PANDEMIC: DIFFERENCES BETWEEN SUMMER AND SCHOOL-YEAR

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Introduction: Insufficient sleep is highly prevalent among school-age youth and adolescents, which has been exacerbated by the COVID-19 pandemic. However, it is unclear whether sleep during COVID-19 varies based on whether school is in session. We examined the sleep of school-age youth and adolescents during COVID-19 and described changes in rates of insufficient sleep from summer (Time 1) to school year (Time 2). We further examined whether insufficient sleep is associated with mental health service utilization.

Methods: Adults in Southwestern Pennsylvania with children under 18 years old in their household completed a repeated cross-sectional electronic survey. The survey was designed to assess usage of, and unmet need for, health and social service resources, among other health behaviors. As responses were anonymous with no longitudinal linking, we used descriptive statistics and Chi-Square tests to examine

our aims at each time point. Insufficient sleep was operationalized as <9 hours (school-age youth) and <8 hours (adolescents) of sleep duration, per National Sleep Foundation standards.

Results: Data were analyzed from n=97 school-age youth and n=83 adolescents at Time 1, and n=77 school-age youth and n=82 adolescents at Time 2. Most school-age youth (76.3%) obtained sufficient sleep at Time 1, which was maintained at Time 2. However, while 75.6% of adolescents obtained sufficient sleep at Time 1, that number fell to 63.3% at Time 2. Youth with insufficient sleep were more likely to utilize mental health services than those obtaining sufficient sleep at a borderline level of statistical significance (p-value = 0.097), after controlling for age group.

Conclusion: The rate of insufficient sleep among adolescents during COVID-19 is meaningfully higher than non-COVID, school-year rates recently reported among adolescents. Youth with insufficient sleep are more likely to utilize mental health services, though the direction of causality in that association is unknown. Future work should focus on strategies for increasing access to sleep promotion programs that support sleep health and mental health during a time of great stress.

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MENTAL HEALTH CLUSTERS DURING COVID-19 PANDEMIC ARE ASSOCIATED WITH MULTIPLE DIMENSIONS OF SLEEP IN A SAMPLE OF PREGNANT WOMEN

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Introduction: Sleep and mental health have a bidirectional relationship. During pregnancy, poor sleep health, depression and stress are common and have been associated with poor maternal and fetal outcomes. The COVID-19 pandemic has introduced additional physical and psychological risk factors, due to high mortality rate, and economic and social repercussions. This study examines whether prenatal maternal mental health clusters are associated with multiple dimensions of sleep during pregnancy in the context of the COVID-19 pandemic.

Methods: From June-December 2020, participants were recruited as part of the COVID-19 Mother Baby Outcomes (COMBO) Cohort at Columbia University (N=188; at recruitment gestational age: 32.2±8.2 weeks; age: 32±6.75 years; N=74 Hispanic, N=65 White non-Hispanic, N=27 Black/African American, N=22 other). Survey data on maternal depression (PHQ-9), perceived stress (PSS), Covid-related stress, and sleep health (PSQI) were collected. Using hierarchical clustering, we created maternal mental health clusters (MMHC). Regressions analyses were implemented to estimate the associations between multiple dimensions of sleep based on MMHC.

Results: We derived three MMHC: Low-risk (no depression, no Covid-stress, low-moderate perceived stress), Covid-stress (no depression, moderate Covid-stress, low-moderate perceived stress) and high-risk (moderate depression, moderate Covid-stress, moderate to high perceived stress). Maternal age, gestational age, income, and race were not significantly different across clusters. The Covid-stress cluster compared to the low-risk cluster reported worse subjective sleep quality ($\beta=0.34\pm 0.11$, $p=0.0025$),

longer sleep latency ($\beta=0.44\pm 0.13, p<0.000$), more sleep disturbances ($\beta=0.67\pm 0.18, p=0.004$) and an overall higher PSQI score ($\beta=0.32\pm 0.13, p=0.017$). Compared to the low-risk group, the high-risk group reported worse subjective sleep quality ($\beta=0.96\pm 0.3, p<0.000$), longer sleep latency ($\beta=0.79\pm 0.13, p<0.000$), shorter sleep duration ($\beta=0.67\pm 0.18, p=0.0003$), lower sleep efficiency ($\beta=0.67\pm 0.25, p=0.008$), more sleep disturbances ($\beta=0.59\pm 0.10, p<0.000$), higher daytime dysfunction ($\beta=0.85\pm 0.10, p=0.000$) and an overall higher PISQI score ($\beta=1.15\pm 0.16, p<0.000$).

Conclusion: Our results indicate that the COVID-19 pandemic has affected mental health profiles during pregnancy, with evidence of a high-risk cluster presenting Covid-stress and depressive symptoms and a Covid-stress cluster presenting Covid-stress without depressive symptoms in a multi-ethnic sample of pregnant women. Both were associated with poorer sleep health outcomes compared to the low-risk cluster. These results have important implications for screening and treatment for the sleep health and obstetric communities during these unprecedented times.

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RACIAL DISPARITIES IN SLEEP DURING THE COVID-19 PANDEMIC.

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Introduction: The purpose of the present study was to estimate average sleep duration and sleep disturbance in the United States during the COVID-19 pandemic. In addition, we investigated whether sleep varied as a function of sociodemographic variables, in particular race. Long standing disparities in condition and available resources between racial demographics often lead to disparities in health. At the advent of a pandemic, which strains these systems further, it is important to assess whether or not racial disparities persist. This is important given that racial groups are likely affected by the pandemic, both directly and indirectly, in various ways. Here, we plan to at least assess whether there are any disparities with regard to sleep.

Methods: 4,048 adults (Mage = 45.8 years; 79% women) completed an online survey during April – June 2020. The final sample's self-reported race/ethnicity consisted of 84% White, 5.1% Black, 3.4% LatinX, 4.2% Asian or Asian American, and 2.9% Multi-racial. Sleep disturbance was assessed using a retrospective sleep diary and the Insomnia Severity Index (ISI).

Results: Average sleep duration in the sample was 7.1 hours. Participants reported taking on average 32 minutes (SD = 38 mins) to fall asleep and reported waking up for 32 minutes (SD = 53 mins) during the night. Approximately 17% of the sample endorsed clinically elevated insomnia symptoms (based on the ISI ≥ 15 cut-off). With regard to racial differences, shorter total sleep time (TST), longer sleep latencies (SL), and greater total ISI scores were observed in Black (mean TST = 6.4 hours; SL = 37.7 minutes; ISI Total = 9.8) and LatinX (mean TST = 6.9 hours; SL = 37.1 minutes; ISI Total = 9.6) participants relative to White participants (Mean TST = 7.1 hours; SL = 30.9 minutes; ISI Total = 8.4). All p 's < 0.05.

Conclusion: Sociodemographic variables, particularly race, should be considered when estimating the relative impact of sleep on overall health. These findings are significant as they may have implications for a number of health disparities observed in the United States, especially during the COVID-19 pandemic.

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CHANGES IN SLEEP HYGIENE AND SLEEPINESS FOLLOWING SOCIAL DISTANCING RELATED TO COVID-19

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Introduction: It was expected COVID-19 would result in changes that could impact sleep hygiene and sleep. We examined sleep hygiene and symptoms of disrupted sleep through late April and May and demographic and psychological variables related to vulnerability/resilience to negative outcomes.

Methods: Participants (Part1: N=180, Part2: N=64; ages 18-85) solicited from a college (students, faculty/staff, alumni, parents) and local community (churches, community centers, libraries) completed a 30-minute survey (measures: sleep hygiene (SH), symptoms of sleep disruption, mental health, personality, social distancing, COVID-19 impact/experience, and demographics) for possible prizes. Part 1, April 20th-May 12th, participants answered trait questionnaires and state questionnaires for before and during social distancing, then repeated state questionnaires two weeks later (Part 2).

Results: Following initial COVID related changes, 66.1% of participants reported worsening symptoms of sleep disruption, 27.9% reported no change, and 6.3% reported improvements. 40.3% reported worsening SH, 53.5% no change, and 6.3% improvements. At 2-week follow-up, 30.4% of participants shifted from reporting no change to SH improvements over baseline. Overall, participants showed significant worsening of symptoms of sleep disruption (sleepiness, moodiness, avolition, cognitive impairments) and SH behaviors (less consistent bed- and wake-times, more frequently staying too long in bed, more pre-bed alerting activities, more bedtime negative emotion, more use of bed for purposes other than sleep, more active technology use) (d's from .23-1.00). Worsening sleep hygiene with COVID-19 was significantly predicted by younger age ($r(157)=.164, p<.05$), more avoidant coping ($r(151)= -.337, p<.05$), lower life satisfaction ($r(156)=.200, p<.05$) and greater impact/experience of COVID-19 ($r(150)= -.270, p<.05$). Symptoms of sleep disruption showed similar, but larger, relationships.

Conclusion: Initial social distancing may have disrupted routines, added stress, and resulted in worsened sleep and sleep hygiene. Over time some adapted and improved, but most did not. Our results suggest change, especially crises such as a pandemic, may alter established behavior for the worse and/or add significant stress. Without intervention, even the robust, i.e., young, may suffer. Variables identifying those more vulnerable to disrupted sleep following change and those more likely to experience worsening sleep may help identify targets for future interventions.

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CHANGING NATIONAL TRENDS IN SLEEP AND RELATED FEATURES AMONG KOREAN ADULTS BETWEEN 2009 AND 2018

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Introduction: Sleep patterns have been linked to various health disease. Evaluating population-level trend of sleep could provide a