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BIDIRECTIONAL ASSOCIATIONS BETWEEN SLEEP AND DAILY BEHAVIORS IN URBAN AMERICAN INDIAN/ ALASKA NATIVE (AI/AN) YOUTH

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Introduction: American Indian/Alaska Native (AI/AN) individuals experience health disparities that emerge early in life. This is the first study to prospectively examine associations between sleep and daily behaviors in urban AI/AN adolescents.

Methods: Participants were 142 urban AI/AN adolescents (mean age = 14 years, 58% female). Sleep health characteristics were measured with actigraphy (total sleep time [TST], sleep efficiency [SE]) and daily diary (bedtime, wakeup time, sleep quality, alertness) over 7 days. Daily behaviors (caffeine consumption, physical activities, participation in traditional cultural activities, electronic use after 8PM, and mood) were measured via daily diary. Multilevel models examined the degree to which nightly sleep predicted next day's behaviors and, reversely, daily behaviors predicted nightly sleep, controlling for age, gender, and weekday/weekends. Weekday/weekend was tested as a moderator.

Results: Earlier bedtime (b = -0.11, p = 0.03) and wakeup time (b = -0.18, p < 0.001) were associated with more physical activity the following day. Earlier wakeup time (b = -0.17, p = 0.048) and shorter TST (b = -0.004, p = 0.03) were associated with greater participation in cultural activities. Later wakeup time (b = 0.96, p = 0.004), better sleep quality (b = 0.38, p < 0.001), longer TST (b = 0.02, p = 0.001), and higher alertness (b = 0.28, p < 0.001) were associated with higher mood rating.When examining the reverse direction, greater daytime caffeine consumption was associated with later wakeup time (b = 0.17, p = 0.01). More physical activity was associated with earlier bedtime (b = -0.12, p = 0.002) and wakeup time (b = -0.12, p = 0.01), but only during weekdays. Participation in cultural activities was associated with later bedtimes (b = 0.14, p = 0.02). More electronic use after 8 PM was associated with later bedtime (b = 0.38, p < 0.001) and wakeup time (b = 0.32, p < 0.001), shorter TST (b = -8.24, p = 0.001) and lower SE (b = -0.94, p = 0.002), with stronger effects on the weekdays than weekends.

Conclusion: Findings highlight dynamic associations between sleep and daily behaviors in AI/AN adolescents and may elucidate novel pathways for intervention and future research.

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REST-ACTIVITY RHYTHMS (RARS) AND COGNITIVE FUNCTIONS IN EARLY POST-MENOPAUSAL WOMEN

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Introduction: RAR disruptions are more common among individuals with dementia than healthy individuals. In healthy older women, RAR disruption predicted future diagnosis of Mild Cognitive Impairment (MCI). With no cure for Alzheimer's Disease, it is crucial to identify modifiable risk-factors for early prevention of cognitive decline. Here we aim to determine whether RAR disruption was associated with cognitive status and cognitive performance in early post-menopausal women, thereby representing a modifiable risk factor for dementia.

Methods: The sample drawn from MsBrain study, included 229 cognitively unimpaired women and 42 women with MCI/ dementia, based on score on Montreal Cognitive Assessment (MOCA) adjusted for age and race. Participants completed a 72-hour wrist actigraphy monitoring and neuropsychological assessment including: California Verbal Learning Test (CVLT), Letter Number Sequencing (LNS), Card Rotation Test, Symbol Digit Modalities Test (SDMT). Latent profile analysis (LPA) was performed using five nonparametric RAR variables (intra-daily variability (IV), inter-daily stability (IS), relative amplitude (RA), alpha and F-statistic). The association between RAR clusters and cognitive performance and the relationship between RAR clusters, cognitive status and race/ethnicity were assessed using linear regression models, controlling for age, race/ethnicity, education and body mass index (BMI); and using chi-square test respectively.

Results: LPA revealed three clusters: Robust with high F-Stat, RA and IS and low IV; Normal;Weak with low RA and high alpha. The proportion of subjects with MCI/dementia did not differ between clusters however there was a significant association between race and RAR clusters, X2 (2, N = 271)=14.18, p<0[P1] .001, with non-white women more likely than white women to belong in the Weak group (p < .01). In an adjusted analysis of healthy women, the Weak group performed worse than the Robust group in LNS control (p<.050). In the unadjusted model, the Weak group performed worse than Robust group in CVLT Total Learning and Long Delay Recall and SDMT (p=.0074, p=.011and p= .0041, respectively).

Conclusion: Non-white women had weaker RAR than their white counterparts. Weaker RARs related to poorer working memory as measured by LNS; and poorer verbal memory and processing speed, measured by CVLT and SDMT however these effects were largely influenced by covariates, particularly race/ethnicity and education.

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AGE AT MENOPAUSE AND INSOMNIA IN A RACIALLY DIVERSE COHORT

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Introduction: Menopause is related to major hormonal, physical, and psychological changes for women, each of which could influence their sleep. However, sleep in women post-menopause may differ by race and ethnicity. We aimed to examine associations between age at menopause and insomnia symptoms among US women by race and ethnicity.

Methods: We utilized 2008-2012 data from the Health and Retirement Study, a nationally representative cohort of US adults age 50+, restricted to women with natural transition to menopause. Age at menopause was retrieved from baseline information (2008) and was used to categorized women into premature menopause (age≤40y), early menopause (age 41-45y), and normal menopause (age>45y). An insomnia composite score was constructed from 2010 and 2012 survey items that assessed insomnia symptoms (i.e., trouble falling asleep, nighttime awakenings, early morning

awakenings, and feelings of nonrestorative sleep). Insomnia items that were reported as "most of the time" were considered positive and contributed to the composite score (range: 0-4). We estimated associations between age at menopause and insomnia symptoms using linear regression models and logistic regression models for continuous and binary outcomes, respectively. Models were stratified by White/non-White race and were adjusted for age, education, physical activity, parity, marital status, and survey year.

Results: Among 4,435 women, 338, 701, and 3,396 reported premature, early, and normal menopause, respectively. In White women, premature menopause was associated with a higher mean composite insomnia score than those who had normal menopause (b=0.20, p=0.03). However, this association was not seen in non-Whites. For individual insomnia survey items, premature menopause in White women was associated with greater odds of nonrestorative sleep (OR=1.98, 1.30-3.03) compared with normal menopause. In contrast, a premature menopause was not associated with nonrestorative sleep in non-Whites. Premature menopause was not associated with other individual insomnia symptoms for both groups.

Conclusion: Premature transition to menopause is associated with increased insomnia symptoms in White women. Among individual insomnia features, premature menopause had the greatest impact on nonrestorative sleep. Given the importance of sleep quality for various health outcomes, our findings highlight a need for more dedicated sleep assessments in women who experience premature menopause.

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CONSUMER DIGITAL HEALTH AND PERSON GENERATED HEALTH DATA – OPPORTUNITIES AND CHALLENGES FOR SLEEP DISPARITIES RESEARCH AND CLINICAL PRACTICE

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Introduction: Social and structural determinants of health—including economic/educational inequalities, healthcare access, systemic racism, and lifetime stress—account for 60-80% of modifiable risk factors that contribute to sleep health disparities. Many sleep interventions use population averages to create "one-size-fits-all" approaches, but are limited by individual heterogeneity in number, magnitude, interplay, and amplification of social determinants. Person-generated health data (PGHD) from widely available consumer wearable and mobile technologies are emerging tools for developing personalized digital interventions targeting unique, multi-level needs of individuals or populations. PGHD can objectively measure individual lived experiences and biobehavioral health including sleep in an objective, low-cost, accessible, and continuous manner outside of intermittent clinical care. However, PGHD are a form of real-world data and are not captured in controlled research settings, impeding their acceptance and use across the healthcare ecosystem. Most studies involving PGHD use "bring-your-own-device" designs which have systematically underrepresented populations experiencing health disparities, including Black or American Indian/ Alaska Native individuals, and low-income populations, limiting their potential to address health inequities. Further, systemic barriers in the healthcare enterprise, including logistical, implementation, validation, interpretation, reimbursement, privacy, and data security challenges could handicap the entire field. To address these gaps, the American Life in Realtime (ALiR) was developed as a generalizable research infrastructure involving a holistic and sociodemographically representative registry of continuously-collected Fitbit and health data. The current study reviews the current challenges associated with the use of consumer PGHD to measure and improve population-specific sleep health and describes how the ALiR advances a critical community resource to mitigate methodological gaps and fully realize the immense potential of consumer PGHD in an equitable manner.

Methods: Leveraging a multidisciplinary perspective, including biomedical engineering, behavioral psychology, clinical medicine, and health policy and economics, we discuss the state-of-the-science regarding sleep PGHD producing technologies, from basic science to clinical application. We explore the strengths and weaknesses of current and emerging initiatives such as All of Us at the National Institutes of Health. Finally, we introduce ALiR and describe how it's sample, recruitment methods, and data elements can be used to mitigate field-wide methodological gaps to improve health equity in sleep research.

Results: To date, 1007 individuals consented to participate in ALiR. Racial/ethnic distributions include 65% White, 13% Black, 4% American Indian / Alaska Native, 9% Asian, 1% Hawaiian / Pacific Islander, 8% Mixed, and 26% Hispanic/Latino, with relatively even gender and age distributions. Seventy percent of individuals are without a bachelor's degree, and 20% have at least one chronic condition (e.g., obesity, cardiovascular disease). Overall response rates exceed 87%, averaging 90% for surveys and 82% for Fitbits. Planned analyses will include a framework for leveraging ALiR to mitigate methodological gaps associated with use of PGHD for sleep health from basic science to clinical application.

Conclusion: ALiR establishes a generalizable research infrastructure to use PGHD to explore the influence of population-specific lived-experiences on sleep and other health outcomes in virtually any population. This novel and ongoing research infrastructure which will ultimately be publically available, providing an invaluable resource to better understand and intervene on sleep health disparities.

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DOES DISCRIMINATION MODERATE THE RELATIONSHIP BETWEEN INSOMNIA AND TELOMERE LENGTH IN OLDER ADULTS FROM THREE RACIAL/ETHNIC GROUPS?

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Introduction: Both insomnia and discrimination have been associated with adverse physical and mental health outcomes. Evidence suggests that discrimination may moderate the effects of sleep on telomeres, DNA sequences at the end of chromosomes that protect them from degradation. The purpose of this study was to determine the relationship between insomnia and telomere length among older non-latinx white, black, and latinx individuals and whether discrimination moderated this relationship differently based on race or ethnicity.

Methods: This study is a secondary analysis from the Health and Retirement Study, a longitudinal project sponsored by the National Institute on Aging. Our analysis consisted of 3,205 US participants who provided information on sleep problems as well as salivary samples from which telomere data were assayed. We computed a linear regression to examine the relationship between insomnia symptoms and telomere length in each racial/ethnic