(SHARE) for their great contribution to the design, data collection, and management of the project. This research was supported by the Swedish Research Council (grant number 2018-02998) and the Swedish Research Council for Health, Working Life and Welfare (grant numbers 2019-01120 and 2020-00313).

SOCIODEMOGRAPHIC, PSYCHOLOGICAL, AND BEHAVIOURAL PREDICTORS OF SLEEP CHANGES IN OLDER ADULTS DURING THE COVID-19 PANDEMIC: A LONGITUDINAL STUDY

K. Gong [1,2,3,4], J. Garneau [1,2,3], I.Z. Dialahy [5], H.-M. Vasiliadis [6], S. Grenier [7,8], T.T. Dang-Vu [1,3,4,8], J.-P. Gouin [2,3,8]. [1] *Sleep, Cognition and Neuroimaging Lab, Concordia University, Department of Health, Kinesiology and Applied Physiology, Montreal, Canada;* [2] *Stress, Interpersonal Relationship and Health Lab, Concordia University, Department of Psychology, Montreal, Canada;* [3] *PERFORM Center, Concordia University, Montreal, Canada;* [4] *Center for Studies in Behavioral Neurobiology, Concordia University, Montreal, Canada;* [5] *Centre Intégré Universitaire de Santé et des Services Sociaux du Nord-de-l'île-de-Montréal, Montreal, Canada;* [6] *Centre de Recherche Charles-Le Moyne, Université de Sherbrooke, Faculté de Médecine et Sciences de la Santé, Longueuil, Canada;* [7] *Université de Montréal, Montreal, Canada;* [8] *Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM), CIUSSS Centre-Sud-de-l'île-de-Montréal, Montreal, Canada*

Introduction: To mitigate the spread of COVID-19, strict lockdown measures were implemented in March of 2020. Although these measures have been shown to disrupt sleep in older adults beyond the effects of typical ageing, the long-term effects of the pandemic on sleep in this population are unclear. The objective of this study is to identify sociodemographic, psychological, and behavioural factors that predict sleep changes throughout the pandemic in older adults.
Materials and Methods: The longitudinal study included 645 older adults (73.10% female; *Mage*= 78.69; *SD*= 5.67) who completed self-report questionnaires at four timepoints: April 2020 (T1), July 2020 (T2), Fall 2020 (T3), and March 2021 (T4). Sociodemographic factors were age, gender, education, income, and living situation. Psychological factors that were assessed were loneliness (UCLA Loneliness Scale), psychological distress (Kessler Psychological Distress Scale), and perceived threat of the pandemic (questionnaire created by our team). Behavioural factors that were measured included physical activity (International Physical Activity Questionnaire) and sleep-related behaviours (retrospective sleep diaries), such as sleep duration, time in bed, and social rhythm within the prior two weeks of administration. The Insomnia Severity Index (ISI) was used to evaluate the severity of insomnia symptoms. Using the total ISI scores at each timepoint, group-based trajectory modelling was conducted to identify sleep trajectories. Subsequently, multinomial logistic regression was performed to find the aforementioned factors at T1 that predicted these trajectories.
Results: Three groups with distinct sleep trajectories were identified: high ISI (*n*= 76), intermediate ISI (*n*= 163), and low ISI (*n*= 406). The high ISI group reported having greater psychological distress (OR= 3.88, 95% CI: 2.42, 6.24), increased variability in time out of bed in the morning (OR= 1.59, 95% CI: 1.13, 2.23), more time in bed (OR= 2.73, 95% CI: 1.68, 4.45), and shorter sleep duration (OR= 0.09, 95% CI: 0.05, 0.17) at T1 than the low ISI group. The intermediate ISI group reported having more psychological distress (OR= 2.01, 95% CI: 1.47, 2.75), more time in bed (OR= 2.14, 95% CI: 1.47, 3.11), and shorter sleep duration (OR= 0.26, 95% CI: 0.17, 0.39) at T1 than the low ISI group. Those in the high ISI group were more likely to be male (OR= 0.25, 95% CI: 0.09, 0.68) and reported having greater psychological distress (OR= 1.93, 95% CI: 1.25, 2.98), increased variability in time out of bed (OR= 1.71, 95% CI: 1.19, 2.45), and shorter sleep duration (OR= 0.36, 95% CI: 0.21, 0.60) at T1 than the intermediate ISI group.
Conclusions: Being male as well as having elevated psychological distress and poorer sleep at the start of the pandemic were risk factors for sleep disturbances over time in older adults. Interventions aimed at reducing psychological distress and sleep disturbances should be implemented.
Acknowledgements: This study was supported by the Centre de recherche de l'Institut universitaire de gériatrie de Montréal and by the Quebec Network for Research on Aging, a thematic network supported by the Fonds de Recherche du Québec - Santé.

SUBJECTIVE SLEEP QUALITY IS THE STRONGEST PREDICTOR OF MENTAL AND PHYSICAL HEALTH INDEPENDENT OF CHRONOTYPE, SLEEP DURATION, APOE-ε4 CARRIERSHIP, AGE, SEX, ALCOHOL CONSUMPTION, AND RETIREMENT STATUS IN HEALTHY OLDER ADULTS

A. Mann [1], A. Michalak [1], Z. Shabana [1], T. Conway [1], C. Dietrich [1], E. Mioshi [1], V. Grove [1], I.M. Clark [2], A.-M. Minihane [1], M. Hornberger [1], A.S. Lazar [1]. [1] *University of East Anglia, Faculty of Medicine and Health Sciences, Norwich, United Kingdom;* [2] *University of East Anglia, School of Biological Sciences, Norwich, United Kingdom*

Introduction: Sleep and circadian rhythm disturbances are risk factors for mental and physical health problems. Carriership of the apolipoprotein E (APOE) gene variant, APOE-ε4, has been associated with objective sleep disturbances; mixed evidence suggests APOE-ε4 may also be implicated in worsened mental and physical health outcomes. This study aims to extend previous findings by examining how self-reported sleep quality, sleep duration, and chronotype independently associate with mental and physical health in healthy older adults, while controlling for APOE-ε4 carriership and other demographic characteristics.
Materials and methods: In total 166 participants (117 female) between 42 and 90 years old (M = 64.69, SD = 9.42) were recruited as part of the screening phase for a sleep-circadian and cognition experiment. Sleep quality was assessed using the Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI) global score, and PSQI subjective sleep quality item. Chronotype was assessed via the Morningness-Eveningness Questionnaire (MEQ) and the Munich Chronotype Questionnaire (MCTQ). Sleep duration was assessed using the PSQI and the General Medical Questionnaire (GMQ). Mental health and physical health were measured using the Short Form Health Survey (SF-36). Data was collected on APOE-ε polymorphism using genotyping; participants were coded as APOE-ε4 carriers or APOE-ε4 non-carriers.
Results: A series of linear regression models assessed the independent associations of self-reported sleep quality, sleep duration, and chronotype with mental health and physical health. Secondary models controlled for age, sex, APOE-ε4 carriership, alcohol consumption, and retirement status. Poor sleep quality was the strongest independent predictor of lower mental health across all measures and models; ISI (Beta = -.410, p<.001), PSQI global score (Beta = -.260, p = .006), and PSQI subjective sleep quality (Beta = -.254, p = .003). The regression models were then run separately for men and women. Lower sleep quality was found to be the strongest predictor of worse mental health, particularly in men (Beta = -.951, p<.001), compared with women (Beta = -.325, p = .001). Lower sleep quality was also associated with lower physical health, but only in women (Beta = -.285, p = .006). Limited meaningful associations were found for chronotype and sleep duration. APOE-ε4 carriership was not found to predict mental or physical health and did not adjust the results of the studied associations in any of the models.
Conclusions: This study found that sleep quality was the strongest independent predictor of mental health in older adults, especially in men. Similarly, lower sleep quality was independently associated with poorer physical health; however this was only found in women. Sleep quality should therefore be considered alongside the assessment and treatment of physical and mental health problems in older adults, independent of APOE-ε4 status and demographic characteristics.
Acknowledgements: This research was supported by funding from the Wellcome Trust to Dr Lazar (207799/Z/17/Z).

THE AGES OF SLEEP ONSET: SPATIO-TEMPORAL EEG PATTERNS IN PREADOLESCENTS, YOUNG AND OLDER ADULTS

L. Annarumma [1], M. Gorgoni [2], F. Reda [2], S. Scarpelli [2], A. D'Atri [3], V. Alfonsi [2], M. Ferrara [3], L. De Gennaro [2,1]. [1] *IRCCS Fondazione Santa Lucia, Body and Action Lab, Rome, Italy;* [2] *Sapienza University of Rome, Department of Psychology, Rome, Italy;* [3] *University of L'Aquila, Department of Biotechonogical and Applied Clinical Sciences, L'Aquila, Italy*

Introduction: Sleep and wakefulness are no more considered mutually exclusive states. In the last decades, several findings pointed out the local and use-dependent nature of sleep features, demonstrating that electrophysiological patterns of both sleep and wakefulness can co-occur simultaneously, in different cortical areas. By definition, Sleep Onset (SO) is an instable state of transition between wakefulness and sleep, and its spatiotemporal dynamics have been exhaustively described in healthy adulthood. The human sleep electroencephalographic (EEG) topography is characterized by strong age-related changes. However, the specific local EEG features of SO during preadolescence and healthy aging have been not extensively described.
Materials and Methods: We aimed to investigate regional and temporal electrophysiological patterns of SO in a group of 23 preadolescents (9-14 years, Exp. 1) and in a group of 36 older participants (59-81 years, Exp 2). Specifically, the pre- vs- post-SO changes in the topography of the 1 Hz bins' EEG power and the time course of the EEG frequency bands during the wake-sleep transition were assessed in both experimental groups. Furthermore, we compared delta activity and delta/beta ratio during the SO between these two groups (Exp. 1: preadolescent, Exp. 2: elderly) and a group of 40 healthy young adults (18-29 years).
Results: In Exp. 1 preadolescents exhibited: a) a generalized post-SO increase in the low frequencies (0.5-6 Hz), especially in the lowest bins (0.5-2 Hz) with a central predominance; b) activity in the 12-13 and 14-15 Hz increased over frontal or central areas, respectively; c) the slowest bins in the beta band showed a slight central increase post-SO. Compared to young adults, delta/beta ratio in preadolescents was higher in posterior areas in both pre- and post-SO and lower in frontal areas in the post-SO. This finding was paralleled by higher delta power in posterior (pre-SO) and centro-posterior areas (post-SO) and lower delta activity in frontal areas (post-SO) in preadolescents.
Exp. 2 showed that elderly had: a) a generalized post-SO power increase in the slowest frequencies; b) a specific pattern of post-SO changes of the alpha frequency; c) a slight post-SO increase of the sigma activity, whereas its highest bins exhibited a frontotemporal decrease. Older adults showed a global decline of the delta power and delta/beta ratio in both pre- and post-SO intervals compared to young adults.
Conclusions: In preadolescents the predominance of the delta activity in more posterior areas compared to young adults and the observation of a not completely mature spindles should be ascribed to development-related maturational processes, pointing to higher homeostatic need from the more mature areas, rather than to different SO dynamics. The reduced delta activity and delta/beta ratio observed in elderly likely depict lightened homeostatic pressure at SO. Taken together, findings parallel the SO process in adults, with a notable difference concerning homeostatic process. In fact, most differences point to crucial developmental changes in homeostatic regulation that play a role in determining age-related wake-sleep transition features.
Acknowledgements: Dr Ludovica Annarumma is funded by grants from the Italian Ministry of Health, grant number RF-2018-12365682.

THE IMPACT OF OBSTRUCTIVE SLEEP APNEA AND ITS TREATMENT IN CELLULAR AND MOLECULAR AGING

B. Santos [1,2,3,4], L. Gaspar [1,2,3,5], C. Carvalhas-Almeida [1,2,3,4], J. Moita [6], C. Cavadas [1,2,3,4], A.R. Álvaro [1,2,3]. [1] *Centre for Neuroscience and Cell Biology (CNC), University of Coimbra, Coimbra, Portugal;* [2] *Center for Innovation in Biomedicine and Biotechnology (CIBB), University of Coimbra, Coimbra, Portugal;* [3] *Institute for Interdisciplinary Research (IIIUC), University of Coimbra, Coimbra, Portugal;* [4] *Faculty of Pharmacy, Doctoral Programme in Pharmaceutical Sciences, Coimbra, Portugal;* [5] *PDBEB - Doctoral Programme in Experimental Biology and Biomedicine University of Coimbra, Coimbra, Portugal;* [6] *Sleep Medicine™ Centre, Coimbra Hospital and University Centre (CHUC), Coimbra, Portugal*

Introduction: Obstructive Sleep Apnea (OSA) is one of the most common sleep disorders worldwide. There is sizable evidence showing the association of OSA with aging by inducing cellular and molecular aging mechanisms (*Gaspar, et al. 2017, 2021*). Understanding OSA putative negative effect on aging progression might contribute to understand new strategies to develop new OSA diagnosis and treatment but also to counteract aging.
Aim: To investigate whether OSA patients show peripheral aging-related cellular and molecular impairments and the impact of OSA treatment.
Materials and Methods: Twenty-six adult male patients (56±10 years) diagnosed with severe OSA were monitored from the moment of diagnosis with polysomnography (PSG), and up to 4 months and 24 months of treatment with continuous pressure positive mask (CPAP) and 13 men of the same age group (49±8 years). Several hallmarks of cellular and molecular aging were evaluated in Peripheral Blood Mononuclear Cells (PBMC). This study was approved by the ethical committee of the Faculty of Medicine of the University of Coimbra and by Coimbra Hospital and University Centre, Portugal.
Results: OSA patients' blood samples show increased mRNA levels of genomic instability players, in comparison with 24 months of treatment ($p<0.05$). In addition, telomeres of OSA patients showed to be shorter in comparison to healthy controls ($p<0.01$), an alteration that accentuates with the treatment (t_{4M}: $p<0.01$; t_{24M}: $p<0.001$). Regarding proteostasis impairments, mRNA levels of autophagy receptors in OSA patients are upregulated in relation to age-matched controls ($p<0.01$).
Conclusions: These results suggest that OSA might induce impairments in hallmarks of aging and CPAP treatment might partially re-stablish some alterations. Hence, OSA early diagnosis and specific treatment may constitute a new strategy to delay ageing.
Acknowledgements: This work was financed by the European Regional Development Fund (ERDF), through the Centro 2020 Regional Operational Programme, under the project CENTRO-01-0145-FEDER-000012 (HealthyAging 2020); through Operational Programme for Competitiveness and Internationalisation (COMPETE 2020) and Portuguese national funds via Fundação para a Ciência e a Tecnologia (FCT), under the projects POCI-01-0145-FEDER-029002 (noOSAnoAGEING, PTDC/MEC-MCI/29002/2017), UIDB/04539/2020 and UIDP/04539/2020; and by the European Social Fund through POCH - Human Capital Operational Programme and Portuguese national funds via FCT under PD/BD/135497/2018, 2020.04499.BD and 2021.05334.BD.
The authors have no conflicts of interest to declare.

THE LINK BETWEEN SLEEP AND GAIT AMONG COMMUNITY DWELLING ADULTS

M. Agmon [1], T. Shochat [1]. [1] *University of Haifa, Nursing, Haifa, Israel*

Introduction: Alarming recent findings indicate that older adults with poor sleep quality have as much as a 4.5-fold higher risk of falls. The potential comorbidity between reduced sleep quality and balance problems has led to growing interest in the study of the relationships between them. Gait and sleep are two basic, modifiable functions that decline throughout the aging process and are associated with deterioration in health and functional outcomes. Although seemingly distinct, both functions share common cognitive, psychological and physiological mechanisms; however, the associations between sleep and gait among community adults with no sleep or balance complaints are poorly understood. The present study aims to explore the associations between sleep indices and gait performance among community dwelling adults.
Materials and Methods: This cross-sectional investigation is based on the "Kibbutzim" longitudinal study. One hundred and three community-dwelling adults (mean age 64±13 years), with no sleep or gait complaints participated. Sleep was evaluated objectively by 7-days of actigraphy (ActiGraph, LLC) and by self-report. Measures included bedtime (BT), sleep duration (SD), sleep efficiency (SE), and wake after sleep onset (WASO). Gait parameters (speed, variability) were measured using the Dual-Task Paradigm, in which gait is assessed twice during a one-minute walk by a mobility lab (APDM Wearable Technologies, Inc.), once with (dual task – DT) and once without (single task – ST) an added cognitive load.
Results: Based on actigraphy, increasing age was significantly associated with earlier BT ($p=0.007$), lower SE ($p=0.1$) and increased WASO ($p=0.1$). Consistent with the literature, sex differences were found for objective (actigraphy, $p=0.002$) and subjective ($p<0.001$) SD, with women sleeping significantly longer than men. No sex differences were found for BT, SE or WASO. A significant main effect was found for SD on gait speed. When comparing gait speed by actigraphy-based SD tertiles (short / intermediate / long), gait speed was significantly slower under the DT condition in long