Associations Between Carotid-Femoral and Brachial-Femoral Pulse Wave Velocity with Sleeping Regularity in College Based Young Adults.

Cardiovascular disease (CVD) is the leading cause of mortality globally 1. Sleep is intrinsically related to health in humans. Lack of sleep time[2], quality[2], and consistency[3] have been linked to increasing risk of CVD. Pulse wave velocity is a proxy of arterial stiffness. Arterial stiffness is indicative of blood vessel health and aging[4]. Sleep irregularity is associated with higher risk of CVD in older adults[3] and is associated with future predictors of CVD like microvascular dysfunction[5], inflammation[6], and adiposity[7] in younger adults. The relationship between sleep regularity and pulse wave velocity has not been thoroughly investigated.

In an initial visit We examined cardiometabolic profiles in 105 participants, while also tracking various other measures for the following 7 days. We used the Vicorder-oscillometry system to measure pulse wave velocity and used the SleepScoreMax device to measure sleep. We performed a multiple linear regression analysis using R-studio programming software. Sleep regularity as measured via three different calculations served as our exposure and two different measures of pulse wave velocity served as our outcome.

Our regression analysis did not yield a significant relationship in any of our models. None of our beta coefficients were prominent enough to suggest practical. Use in a clinical setting.

Further investigation is needed in order to establish a relationship between these two variables. If performing this analysis again refinement of protocol is recommended.

1: Roth, G. A. *et al.* Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019: Update From the GBD 2019 Study. *Journal of the American College of Cardiology* vol. 76 2982–3021 Preprint at https://doi.org/10.1016/j.jacc.2020.11.010 (2020).

2: Lao, X. Q. *et al.* Sleep quality, sleep duration, and the risk of coronary heart disease: A prospective cohort study with 60, 586 adults. *Journal of Clinical Sleep Medicine* **14**, 109–117 (2018).

3: Huang, T., Mariani, S. & Redline, S. Sleep Irregularity and Risk of Cardiovascular Events: The Multi-Ethnic Study of Atherosclerosis. *J Am Coll Cardiol* **75**, 991–999 (2020).

4: Vasan, R. S. *et al.* Arterial Stiffness and Long-Term Risk of Health Outcomes: The Framingham Heart Study. *Hypertension* **79**, 1045–1056 (2022).

5: Hoopes, E. K. *et al.* Sleep duration regularity, but not sleep duration, is associated with microvascular function in college students. *Sleep* **44**, (2021).

6: Hoopes, E. K. *et al.* Consistency where it counts: Sleep regularity is associated with circulating white blood cell count in young adults. *Brain Behav Immun Health* **13**, (2021).

7: Morales-Ghinaglia, N. & Fernandez-Mendoza, J. Sleep variability and regularity as contributors to obesity and cardiometabolic health in adolescence. *Obesity* **31**, 597–614 (2023).