The Association Between Sleep Regularity and Heart Rate Variability

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METHODS

Study Design
- Cross-sectional observational study.

Participants
- Forty-eight college-based young adults (18-24 years).

Predictor Variable:
- Sleep regularity (standard deviation of total sleep duration across a seven-day recording period) measured using the validated SleepScore Max device.

Outcome Variables (recorded during 5 min of quiet rest via electrocardiography [Mindware Mobile]):
- Root Mean Square Successive Difference (RMSSD) Heart Rate Variability (ms; HRV).
- High-Frequency (HF) HRV (ms^2; 0.15-0.40 Hz).

Statistical Analysis
- Multiple linear regression (SPSS) with adjustment for race, sex, and body mass index as covariates.

Table 1. Participant Characteristics

Variable	Mean (SD) / N (%)
Age (Years)	20.56 (1.71)
Sex (Male)	11 (23)
Race (White)	34 (71)
Body Mass Index	23.34 (3.63)

1. Tiwari, R., et al. (2021). *Current cardiology reviews, 17*(5).

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PROBLEM

Heart rate variability (beat-to-beat changes in the time intervals between successive heartbeats; HRV) is a measure of autonomic nervous system activity. A lower resting HRV independently predicts cardiometabolic disease risk[1]. Sleep regularity, defined as the consistency of daily sleep duration, is a novel and emerging factor that is also linked to cardiometabolic disease risk. Previous research indicates that a more optimal total sleep duration is associated with higher HRV (beneficial); however, the relationship between sleep regularity and resting HRV is yet to be determined.

OBJECTIVE

To examine the relationship between sleep regularity and resting HRV in college-based young adults, a population known for poor sleep patterns.

TAKE HOME

This preliminary analysis found no relationship between sleep regularity and resting HRV. However, further investigation is needed with a larger sample size, different population, and additional covariates.

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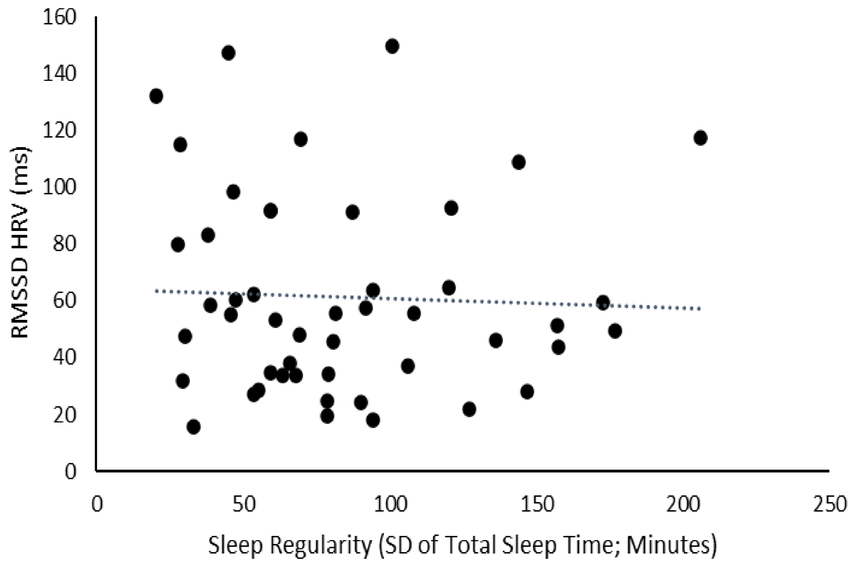
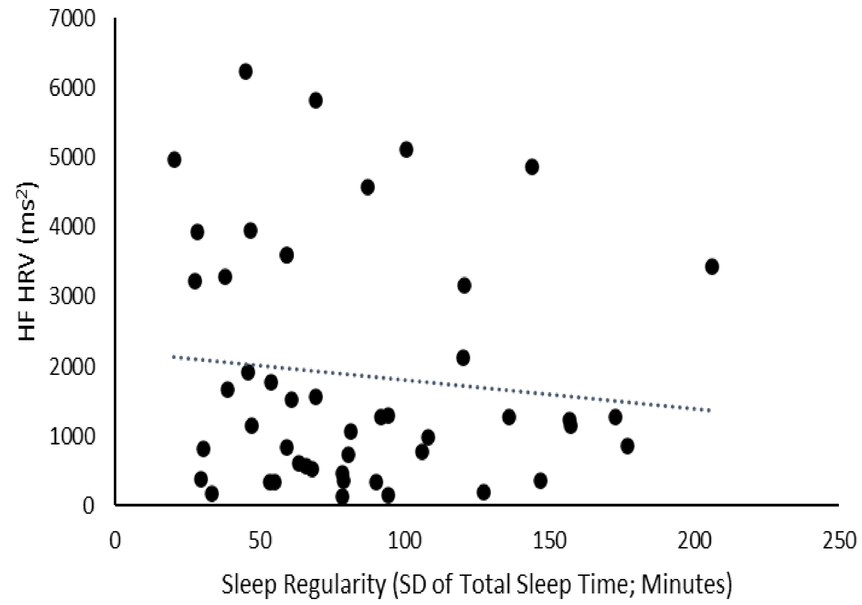
RESULTS:

- **Figure 1:** No significant relationship emerged between sleep regularity and RMSSD HRV (β = -0.011, p = 0.946, 95% CI = -0.004 — 0.004).



- **Figure 2:** No significant relationship emerged between sleep regularity and HF HRV (β = -0.034, p = 0.832, 95% CI = -0.008 — 0.007).



Note. Given the non-normal distribution of the HRV data, the regressions were conducted using natural log-transformed HRV variables. However, the results in Figures 1 and 2 above reflect the raw (untransformed) values to aid interpretation.