

Peer Review

Review of: "Exploring the Multidimensional Influences on Sleep and Active Heart Rate Dynamics: A Comprehensive Study"

Hany Akeel Al-hussaniy¹

1. University of Baghdad, Iraq

This study provides a comprehensive and methodologically sophisticated investigation into the multidimensional determinants of sleep and active heart rate dynamics in college students, and its major strengths include the large longitudinal wearable-derived dataset, integration of social, behavioral, environmental, and psychological variables, and the application of latent growth-curve modeling to capture within- and between-subject variability. The manuscript successfully demonstrates the complexity of cardiovascular regulation in young adults and offers valuable insights into contextual and lifestyle-related influences on heart rate patterns. However, several refinements could strengthen its scientific clarity and translational impact. The manuscript would benefit from clearer prioritization of key findings, as the results and discussion sections are highly descriptive and occasionally repetitive, which may obscure the most clinically relevant conclusions. Greater emphasis on effect size interpretation and clinical significance, rather than statistical significance alone, would improve applicability. The study also requires deeper consideration of potential confounders such as caffeine consumption, medication use, substance exposure, stress biomarkers, and underlying medical conditions, which may substantially influence heart rate variability. Additionally, the generalizability of findings is limited due to the single-campus cohort and should be more critically addressed. The causal inference should be cautiously framed, and further discussion of potential biological mechanisms linking social and psychological factors with cardiovascular responses would enhance theoretical depth. Finally, inclusion of visual summary models or integrative conceptual diagrams and clearer categorization of predictors could improve readability and strengthen the manuscript's overall impact.

Declarations

Potential competing interests: No potential competing interests to declare.