CHARACTERIZING DEVICE-MEASURED SLEEP AND HEALTH RESEARCH USING COMPOSITIONAL DATA ANALYSIS: A SYSTEMATIC REVIEW

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INTRODUCTION

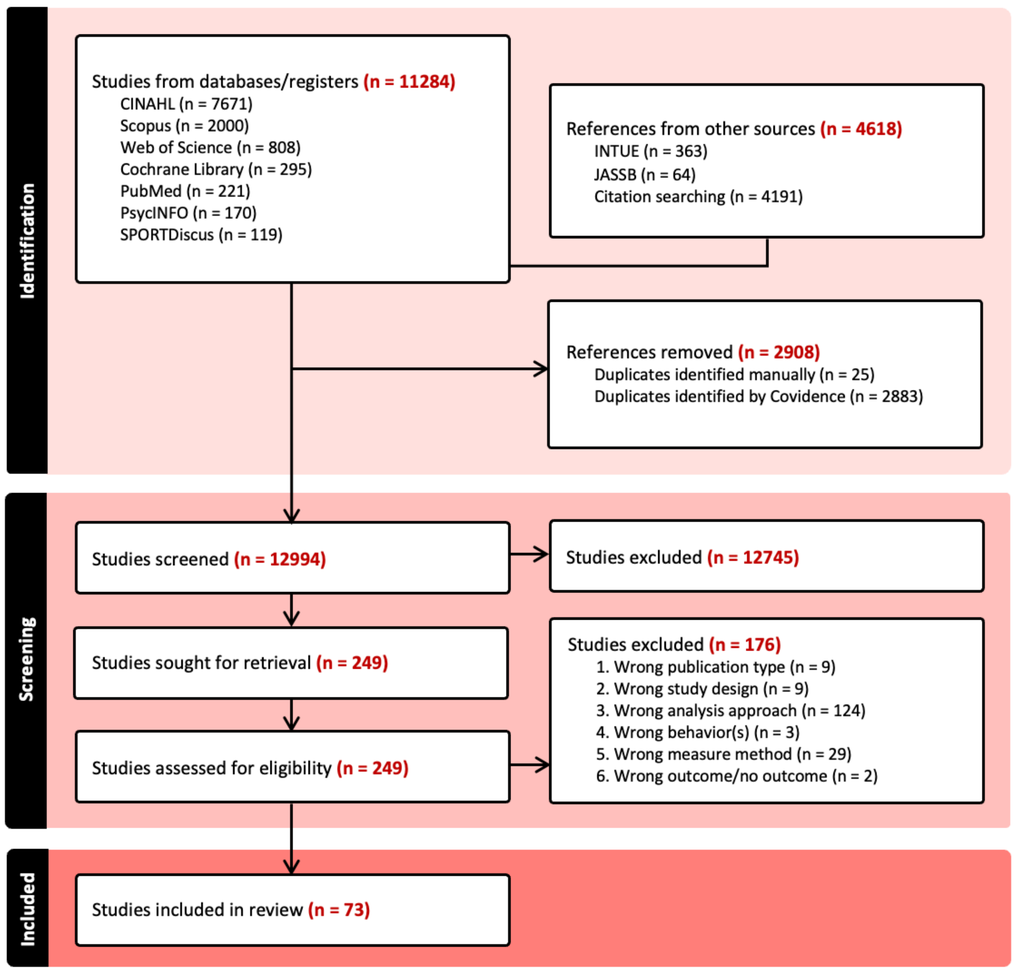
- Recent frameworks have recognized the interactive nature and mutual influence of behaviors within a 24-hour cycle and their impact on health across the lifespan (1,2).
- Approaches such as compositional data analysis (CoDA) are recommended to examine the relations between 24-hour movement behaviors and health outcomes (3).
- However, recent reviews have identified notable sleep measurement and reporting gaps, which may hinder understanding of its contribution to health (4,5).
- There is a need to better understand current practices and identify areas for improvement to support more consistent methodologies and enhance the integration of sleep within the broader 24-hour movement behavior paradigm.

PURPOSE

To characterize device-measured sleep data measurement, processing, and reporting in studies using CoDA with 24-hour movement behaviors.

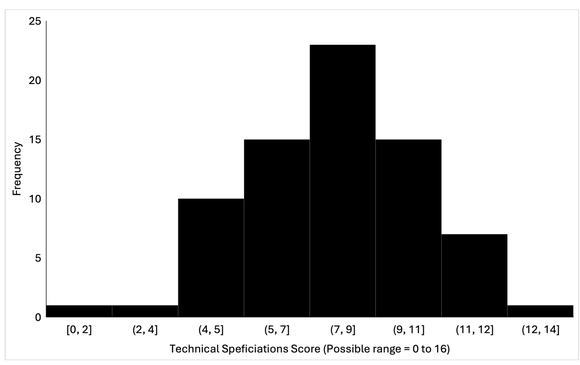
METHODS

Population	Exposure	Outcome	Other
• Human participants • Any age	• 24-hr behaviors (with sleep) • Measure (device-measured) • CoDA with isometric log ratios	• Non-behavioral health measure	• Empirical study with analytical observational design • English articles published in peer-reviewed 2015+

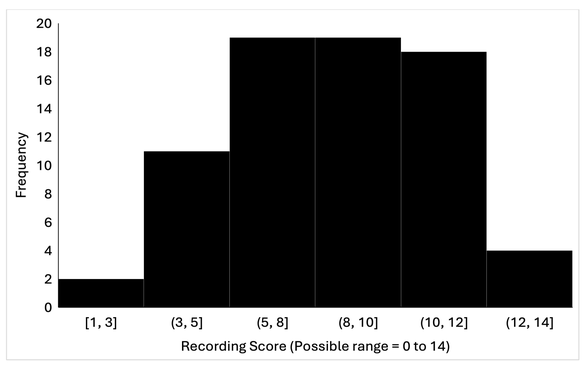


RESULTS

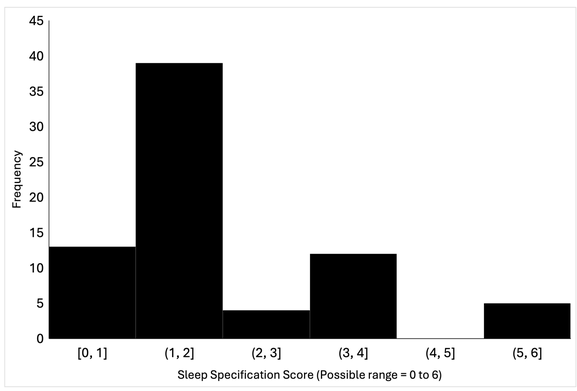
Technical Specifications for Device & Settings



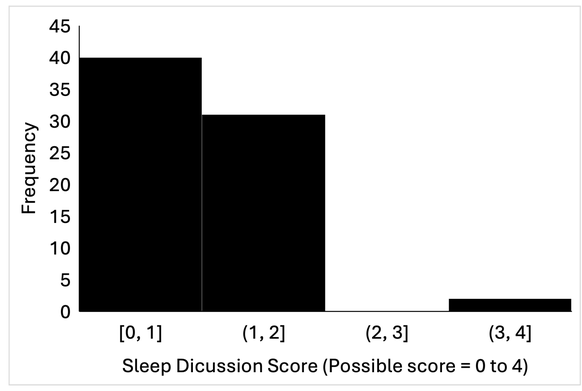
Specifications for Recording Sleep Metrics



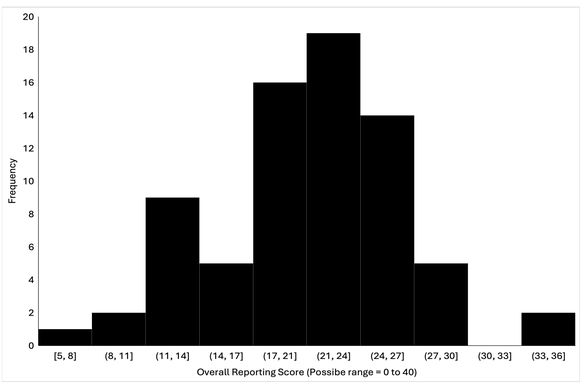
Specifications of Sleep Metrics



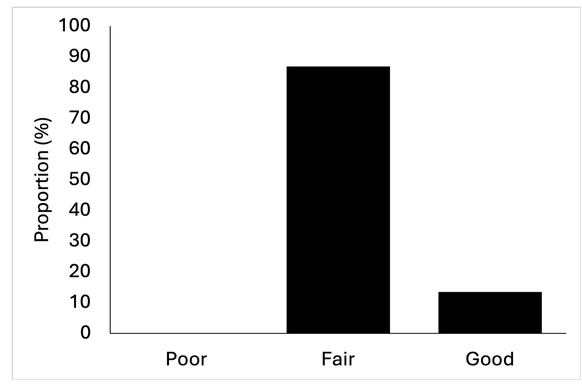
Sleep Discussion



Specifications of Sleep Metrics



Methodological Quality And Risk of Bias



CONCLUSION

- This review identified key gaps in the measurement, processing, and reporting of device-measured sleep in studies using CoDA.
- Inconsistent protocols and reporting on sleep data processing highlight the need for standardized approaches and reporting practices.
- Future research should prioritize transparency and consistency to improve the validity and comparability of findings on sleep's role as a compositional component of 24-hour movement behaviors.

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