

Title: Assessing seasonal and weather effects on depression and physical activity using mobile health data

Abstract

We would like to present some findings in our recent publication in NPJ Mental Health Research entitled “Assessing seasonal and weather effects on depression and physical activity using mobile health data” (<https://doi.org/10.1038/s44184-025-00125-x>). This paper is a first-in-class analysis quantifying the complex interplay between depression severity, external environment (weather), and physical activity (measured by wearable devices) in a real-world longitudinal mobile health study. The abstract of this paper is shown below:

Seasonal and weather changes can significantly impact depression severity, yet findings remain inconsistent across populations. This study explored depression variations across the seasons and the interplays between weather changes, physical activity, and depression severity among 428 participants in a real-world longitudinal mobile health study. Clustering analysis identified four participant subgroups with distinct patterns of depression severity variations in one year. While one subgroup showed stable depression levels throughout the year, others peaked at various seasons. The subgroup with stable depression had older participants with lower baseline depression severity. Mediation analysis revealed temperature and day length significantly influenced depression severity, which in turn impacted physical activity levels indirectly. Notably, these indirect influences manifested differently or even oppositely across participants with varying responses to weather. These findings support the hypothesis of heterogeneity in individuals' seasonal depression variations and responses to weather, underscoring the necessity for personalized approaches in depression management and treatment.