LONGITUDINAL DATA FROM ACTIVITY TRACKERS SHOW THAT THOSE WITH GREATER INCONSISTENCY IN ACTIVITY LEVELS ARE MORE LIKELY TO DEVELOP MORE SEVERE DEPRESSION

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OBJECTIVES: Activity tracker-based behavioral data can be used to further understand disease severity for individuals with mental health conditions. However, there is limited data on how behavioral patterns are associated with changes in severity of depression and anxiety. In this analysis, we examined the association between changes in behavioral traits and changes in disease severity for individuals with depression and/or anxiety.

METHODS: In this currently ongoing 1-year long observational study, participants track their activity and sleep levels using activity trackers, and complete quarterly questionnaires that assess depression and anxiety severity (measured by PHQ-9 and GAD-7). Baseline and month 6 survey data were used to assess changes in disease severity over 6 months. Behavioral data from 3 months pre-enrollment were used in this analysis to calculate per-patient statistics (e.g., daily mean, standard deviation [SD]) of step and sleep metrics. In this analysis, we utilized a multiple linear regression framework, regressing age and gender, and behavioral features on the change in PHQ-9 from baseline to 6 months.

RESULTS: There are 1,304 participants enrolled in this study. We found that participants with more day-to-day variability in step count (higher coefficient of variation [CV] of steps) and higher step count on the most active days were more likely to have their condition worsen over 6 months (i.e., more likely to have moderate/severe depression at month 6). In this analysis, none of the computed sleep metrics had a statistically significant association with worsening symptoms at month 6.

CONCLUSIONS: Those with greater variability and inconsistency in activity levels were more likely to develop moderate/severe depression. This analysis identified certain behavioral patterns as potential predictors of moderate/severe depression and worsening of disease severity, which should be validated in further studies.