

Early morning university classes are associated with impaired sleep and academic performance

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Attending classes and sleeping well are important for students' academic success. Here, we tested whether early morning classes are associated with lower attendance, shorter sleep and poorer academic achievement by analysing university students' digital traces. **Wi-Fi connection logs in 23,391 students revealed that lecture attendance was about ten percentage points lower for classes at 08:00 compared with later start times.** Diurnal patterns of Learning Management System logins in 39,458 students and actigraphy data in 181 students demonstrated that **nocturnal sleep was an hour shorter for early classes because students woke up earlier than usual.** Analyses of grades in 33,818 students showed that **the number of days per week they had morning classes was negatively correlated with grade point average.** These findings suggest concerning associations between early morning classes and learning outcomes.

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