Children's Hospital of Philadelphia PolicyLab

Feasibility and Acceptability of Mobile Methods to Assess Home and Neighborhood Environments Related to Adolescent Sleep

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A growing evidence base suggests home and neighborhood environmental exposures may influence adolescent sleep, but few studies have assessed these relationships using methods that account for time-varying, location-specific exposures, or multiple neighborhood contexts. This study aimed to assess the feasibility and acceptability of using smartphone global positioning system (GPS) tracking and ecological momentary assessment (EMA) to assess time-varying home and neighborhood environmental exposures hypothesized to be associated with adolescent sleep. Adolescents aged 15-17 years in Philadelphia completed 7 days of continuous smartphone GPS tracking, which was used to identify daily levels of exposure to geocoded neighborhood factors (eg, crime, green space). Four daily EMA surveys assessed home sleep environment (eg, noise, light), stress, health behaviors, and neighborhood perceptions. Feasibility and acceptability of GPS tracking and EMA were assessed, and distributions of daily environmental exposures were examined. Among 25 teens (mean age 16, 56% male), there was a high level of GPS location data captured (median daily follow-up: 24 hours). Seventy-eight percent of EMA surveys were completed overall. Most participants (96%) reported no privacy concerns related to GPS tracking and minimal burden from EMA surveys. Exposures differed between participants' home neighborhoods and locations visited outside the home neighborhood (eg, higher crime away from home). Sleep environment disruptions were present on 29% of nights (most common: uncomfortable temperature) and were reported by 52% of adolescents. Results demonstrate the feasibility and acceptability of mobile methods for assessing time-varying home and neighborhood exposures relevant to adolescent sleep for up to 1 week.

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