Dementia and Technology

Exploring Sleepsense Bed Sensor Technology for Sleep Monitoring in a Geriatric Acute Care Unit L. Hung, C. Acosta, Y. Zhao, K. L. Y. Wong, Y. Ye, J. Laurence, M. Towell. *Gerontechnology* 25(s*)*

Purpose Sleep quality is essential for health and recovery in older adults, but current hospital monitoring methods often lack accuracy and detail for guiding care. Sleepsense, an AI-driven, non-wearable bed sensor, tracks sleep patterns and vital signs unobtrusively, offering potential improvements over existing methods (1). This study aimed to compare Sleepsense with current clinical sleep assessment methods and explore patient and staff perspectives on their accuracy, usability, and limitations. **Methods** A mixed-methods design was used. Quantitative data included Richards-Campbell Sleep Questionnaire (RCSQ) responses, Somnolog staff reports, and Sleepsense metrics. The RCSQ was completed in the morning, while Somnolog recorded data during the preceding night and sensor data were collected continuously. Data were analyzed using Pearson correlations to assess associations between subjective and objective measures and paired t-tests to compare staff-recorded versus sensor-detected events. Qualitative data came from interviews with 22 patients and focus groups with 33 interdisciplinary staff. **Results and discussion** Sleepsense detected an average of 4.5 "got up" events per patient, versus 2.6 recorded by staff. No correlation was found between subjective (RCSQ) and objective (Sleepsense) measures of sleep depth, latency, or time awake, indicating potential divergence between perceived and sensor-measured sleep dimensions. However, better RCSQ sleep quality was associated with fewer "got up" events (r = -0.445, P<0.05) and longer light sleep duration (r = 0.438, P<0.05) on Sleepsense, suggesting that patients who report better sleep generally get up less and may rely more on light sleep duration to perceive their overall sleep quality. Staff valued Sleepsense for its non-intrusiveness, continuous monitoring, and potential to reduce nighttime disruptions, but raised concerns about occasional inaccuracies and data interpretation. Qualitative themes highlighted challenges and limitations of current records, the perceived accuracy and reliability of Sleepsense, and the complementarity of multiple assessment methods to support holistic, patient-centred care. Sleepsense shows promise as a non-wearable,unobtrusive tool for monitoring sleep in acute care. Effective implementation will require addressing accuracy concerns and integrating the system with existing care practices, while leveraging complementary methods like RCSQ and Somnolog for a comprehensive understanding of patient sleep.

References
1. Acosta CG, Ye Y, Wong KLY, Zhao Y, Lawrence J, Towell M, et al. Implementing AI-Driven Bed Sensors: Perspectives from Interdisciplinary Teams in Geriatric Care. Sensors. 2024 Oct 23;24(21):6803.