Dementia and Technology

Staff Experiences and Resident Safety Outcomes with Non-Wearable Sleep Monitoring Technology in Long-Term Care L. G. Franciosi, P. Magtibay. *Gerontechnology* 25(s)

Purpose   As staffing shortages in long-term care facilities intensify, technology-enabled solutions for monitoring resident safety and improving care efficiency are increasingly needed [1, 2]. This quality assurance study evaluated staff experiences and perceived benefits of a non-wearable, non-contact bed sensor technology designed to monitor sleep patterns, vital signs, and bed-exit activities within residential care settings. The study examined the impact of this sleep monitoring system on staff workflow efficiency, resident safety, and quality of care, with particular attention to barriers and facilitators for successful implementation and how staff feedback could inform person-centered, age-inclusive technology design. **Method**   A mixed-methods evaluation was conducted in a 102-bed residential care facility to implement the sleep monitoring technology. Data were collected through staff satisfaction surveys (n=34 respondents across multiple shifts and roles including care aides, nurses, and managers), qualitative interviews, and focus group discussions. Survey participants rated their agreement with statements regarding system usability, workflow efficiency, resident safety, and clinical utility on 5-point Likert scales. Open-ended survey responses and focus group transcripts were analyzed thematically to identify key implementation factors, perceived benefits, and operational challenges; themes were then translated into actionable recommendations for care practices (e.g., prioritizing residents with high-risk alerts on night rounds) and for system configuration and training protocols to optimize person-centered use. Implementation periods ranged from one-month pilot trials to continuous deployment over multiple months, and the overall setup was a bedside sensor unit, network hub, and dashboard display, which is a non-contact monitoring configuration relative to the resident's bed.   **Results and Discussion**   Staff reported overall positive experiences with the sleep monitoring technology across multiple dimensions. Seventy-six percent of survey respondents agreed or strongly agreed that the technology improved working-hours efficiency, while 72% reported enhanced capacity to provide better resident care. Eighty-four percent noted that the system provided previously inaccessible information on nightly sleep patterns and vital signs, supporting earlier identification of changes in resident status. Staff particularly valued real-time fall-risk or bed-exit alerts (64% agreement for resident safety support), which reduced the need for intrusive hourly room checks during night shifts and allowed more targeted, less disruptive monitoring. However, implementation success was highly dependent on organizational factors including reliable internet connectivity, comprehensive staff training, and leadership engagement. Technical challenges including sensor misalignment during routine housekeeping, delayed alerts due to Wi-Fi bandwidth constraints, and inaccurate readings for residents with atypical body weights were identified as barriers to sustained use. Despite these limitations, staff recognized the potential of non-wearable sensors to address staffing challenges and enhance person-centered care by enabling individualized night-time monitoring plans based on residents' typical sleep patterns and risk profiles. The findings support age-inclusive gerontechnology design principles, emphasizing non-intrusive hardware, clear visual interfaces for staff, and adaptable alert thresholds tailored to frail older adults in congregate settings. This sleep monitoring approach shows promise for scalable adoption in other long-term care environments with similar infrastructure by leveraging existing Wi-Fi networks and standard nursing workflows, provided organizations invest in reliable connectivity, structured training, and leadership-supported change management to embed technology-driven monitoring into routine person-centered practice.

References
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