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Sleep and indoor environmental quality in homes of people with dementia and informal caregivers: a pilot study

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Purpose Worldwide the number of people with dementia (PwD) is increasing. Most PwD live at home with the support of informal care, provided by family friends, neighbours, and volunteers (Greenwood & Smith, 2019). Most PwD eventually experience difficulties with sleep (Petrovsky et al., 2018). This can express itself in different ways, e.g. more naps during the day, difficulties falling asleep, and waking up at night or too early. Problems with sleeping can significantly affect the quality of life and that of their informal caregiver and may increase the burden of care (Byun et al., 2016). It is known that indoor environmental quality (IEQ) may influence the quality of sleep of healthy (older) people (Strøm-Tejsen et al., 2016; Van der Veen et al., 2021). There is less known about the effect of IEQ, and other indoor environmental parameters, on the sleep quality of people with dementia. A pilot study was conducted to get more knowledge about the effect of indoor environmental quality on the sleep quality of PwD and their informal caregivers. **Method** This qualitative study was part of a field study performed. The study participants were individuals with dementia living at home and their informal caregivers (if available). Two households consisting of two persons with dementia and one informal caregiver participated in the pilot. The study was conducted for three weeks in which measurements were performed. Indoor environmental quality conditions in the bedrooms of PwD were monitored, including light intensity, temperature, humidity, and IAQ indicators such as CO_2, particulate matter, and total volatile organic compounds (TVOC) concentrations. Measurements were performed using AEther (Hogeschool Utrecht, n.d.) and AirTeq sensors (Zheng et al., 2022). Simultaneously, sleep patterns and sleep quality of PwD and their caregivers were monitored, for this the Qura Ring Gen 3 (Svensson et al., 2024) was employed and collected detailed sleep metrics, including e.g. total sleep time, wake after sleep onset, and sleep onset latency. Additionally, the sleep quality of the informal caregivers was assessed using a modified questionnaire. This combined 15 true/false questions from the Groninger Sleep Quality Scale (Mulder et al., 1980) and 4 questions from the Morning questionnaire (Mishra et al., 2018), to rate the depth of sleep and restfulness during the night. **Results and Discussion** Qualitative findings are already presented at Alzheimer Europe 2023 (Helsinki, Finland). The study wants to identify potential correlations between indoor environmental sleeping conditions and the sleep quality of PwD and their informal caregivers. The findings propose to raise the awareness of professionals and caregivers about the effect of the indoor environment on dementia and its symptoms. In addition, the results inform potential improvements in the sleeping environment to enhance the well-being of PwD which also aims to reduce the burden of care of informal caregivers.

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