

## AI-based Digital Healthcare Application to Assess and Reduce Fall Risks in Residents of Nursing Homes in Germany

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**Abstract :** Objective: Falls in older people cause an autonomy loss and result in an economic burden. LCare is an AI-based application to manage fall risks. The study's aim was to assess the effect of LCare use on patient outcomes in nursing homes in Germany. Methods: LCare identifies and monitors fall risks through a 3D-gait analysis and a digital questionnaire, resulting in tailored recommendations on fall prevention. A study was conducted with AOK Baden-Württemberg (01.09.2019- 31.05.2021) in 16 care facilities. Assessments at baseline and follow-up included: a fall risk score; falls (baseline: fall history in the past 12 months; follow-up: a fall record since the last analysis); fall-related injuries and hospitalizations; gait speed; fear of falling; psychological stress; nurses experience on app use. Results: 94 seniors were aged 65-99 years at the initial analysis (average  $84 \pm 7$  years); 566 mobility analyses were carried out in total. On average, the fall risk was reduced by 17.8 % as compared to the baseline ( $p < 0.05$ ). The risk of falling decreased across all subgroups, including a trend in dementia patients ( $p = 0.06$ ), constituting 43% of analyzed patients, and patients with walking aids ( $p < 0.05$ ), constituting 76% of analyzed patients. There was a trend ( $p < 0.1$ ) towards fewer falls and fall-related injuries and hospitalizations (baseline: 23 seniors who fell, 13 injury consequences, 9 hospitalizations; follow-up: 14 seniors who fell, 2 injury consequences, 0 hospitalizations). There was a 16% improvement in gait speed ( $p < 0.05$ ). Residents reported less fear of falling and psychological stress by 38% in both outcomes ( $p < 0.05$ ). 81% of nurses found LCare effective. Conclusions: In the presented study, the use of LCare app was associated with a reduction of fall risk among nursing home residents, improvement of health-related outcomes, and a trend toward reduction in injuries and hospitalizations. LCare may help to improve senior resident care and save healthcare costs.

**Keywords :** falls, digital healthcare, falls prevention, nursing homes, seniors, AI, digital assessment

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