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Dementia Care, Fall Detection, and Ambient Assisted Living Technologies Help Older Adults Age in Place

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BACKGROUND

- Gerontechnology — defined as technology designed to enable the health of older persons — has become a key focus of biomedical research.
- Ideally, technology should assist older persons with “aging in place” when disabilities such as cognitive impairment or mobility issues occur.
- Potential benefits include lower healthcare costs and improved quality of life and safety. Uptake of technology by older adults (OAs) has been increasing but remains dependent on the usability — or ease of using the devices.
- The three domains of dementia care, falls, and home supports are some of the greatest challenges faced by older adults in “aging in place” and are the focus of this review.

OBJECTIVE

We aimed to highlight three growing areas of gerontechnology (dementia care, fall detection, and ambient assisted living [AAL]), describe recent advances in the field, summarize existing literature on usability, and identify knowledge gaps.

METHODS

- We conducted a literature search in the following five databases: PubMed, CINAHL, EMBASE, PsycINFO, and MEDLINE.
- Independent reviewers performed title/abstract review, full-text screening, data extraction, and study characteristic summarization.
- Due to the scoping review approach, as well as the volume and heterogeneity of included articles, a formal assessment of study quality or risk of bias was not completed.

RESULTS

Figure 1. PRISMA flow diagram of included studies

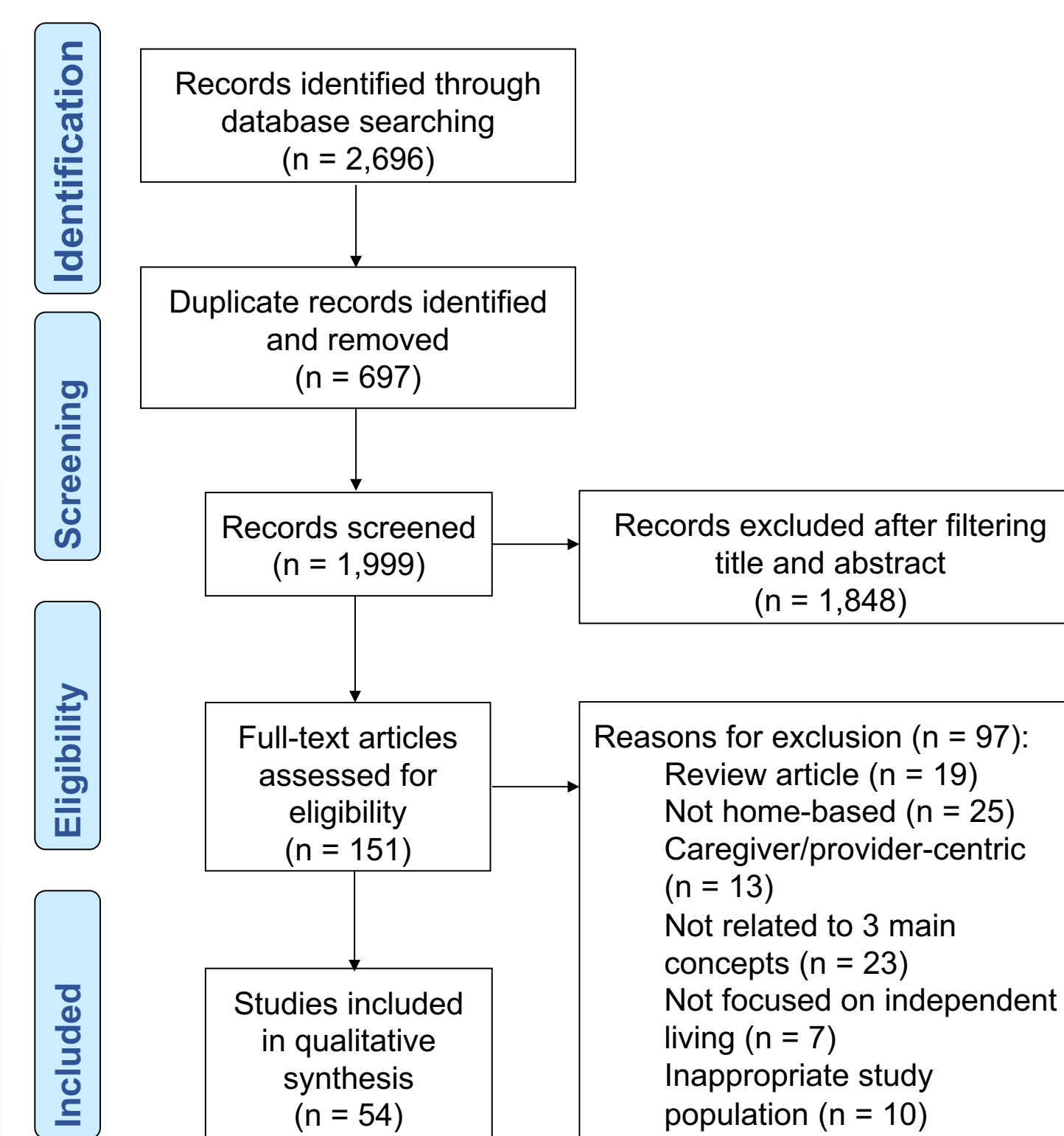


Figure 2. Global distribution of included studies

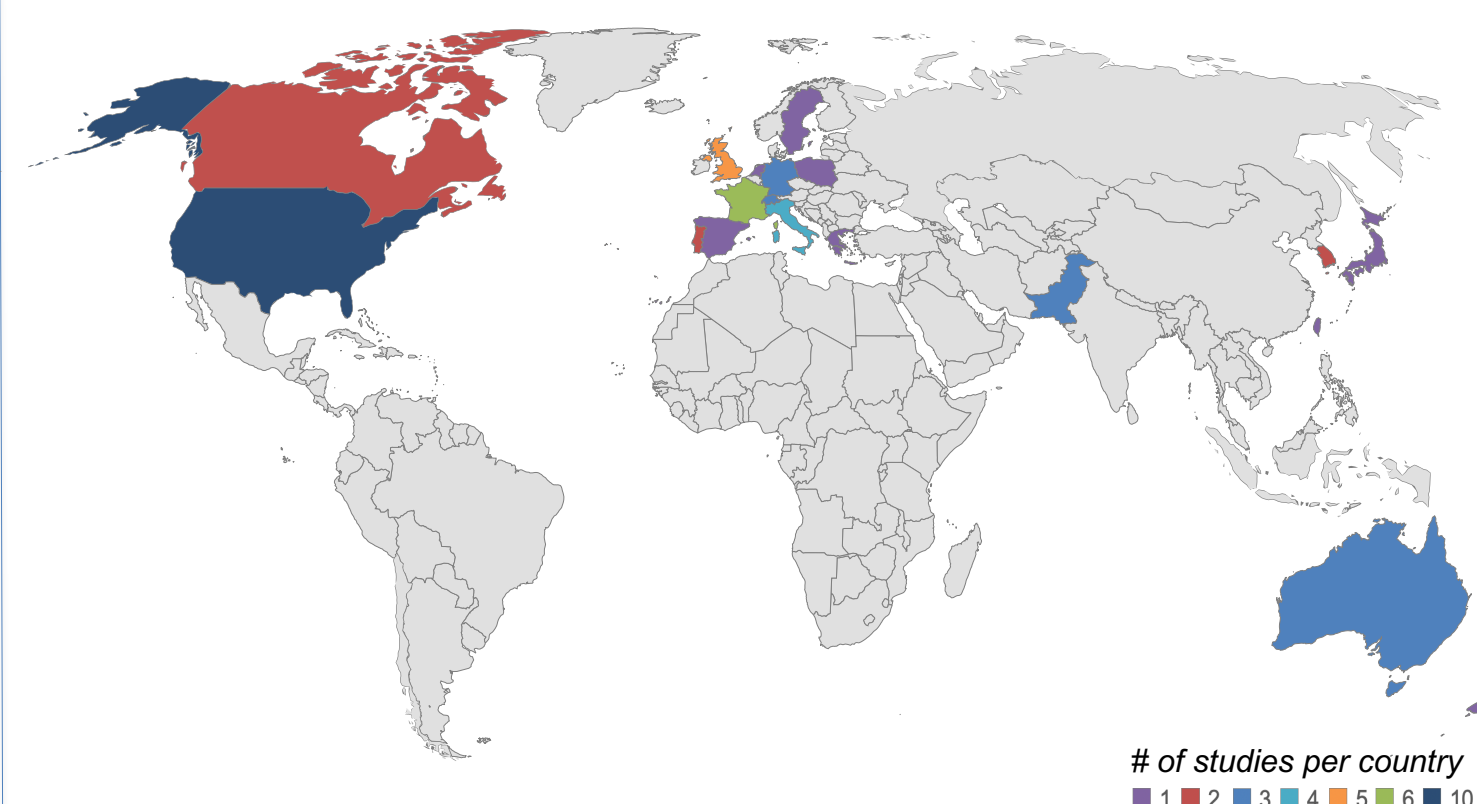
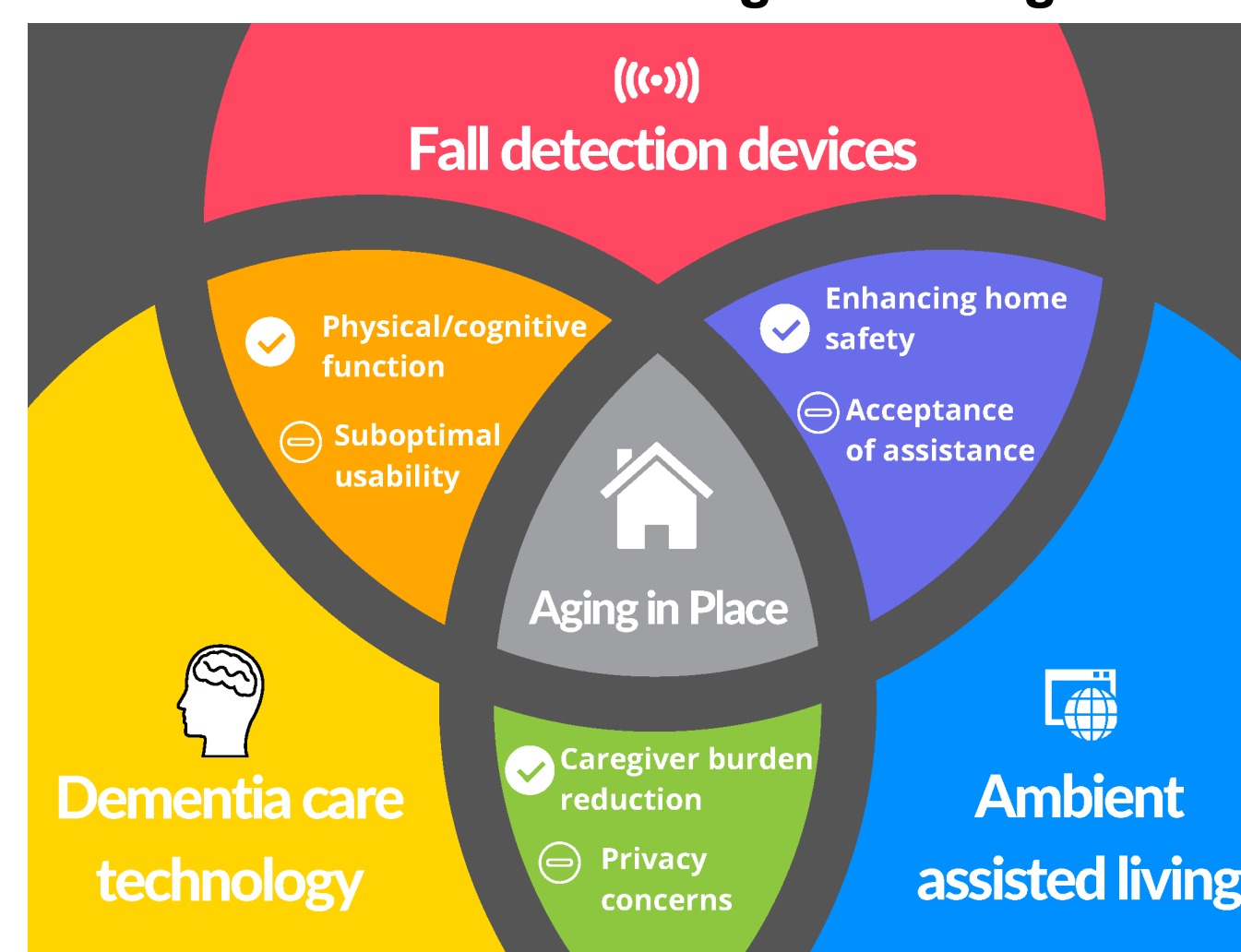


Figure 3. Opportunities and barriers of dementia care, fall detection devices, and ambient assisted living technologies



KEY FINDINGS

Dementia care technology

- Persons with dementia (PWD) were generally receptive.
- Lack of experience with technology, lack of desire for assistance by technology, difficulties learning how to use technology, and privacy concerns were barriers for PWD.

Fall detection devices

- OAs generally found fall detection devices to be acceptable and preferred wearable ones over environmental ones.
- Concerns about fall detection devices include occasional false positives, insufficient battery life, and embarrassment.

Ambient assisted living

- Caregivers rated monitoring systems higher than OAs, noting that AAL increased their sense of control and reduced their caregiving burden.
- Some OAs did not appreciate being monitored and had privacy concerns.

CONCLUSIONS

- Technologic innovations directed towards dementia care, fall detection, and ambient assisted living can aid older adults “age in place.”
- Several concerns about adopting technology for health still exist, including privacy concerns, affordability, and device overload.

FUTURE DIRECTIONS

- Overall, more randomized controlled trials and comparative studies are needed.
- For dementia care, more studies should focus on how assistive technologies can foster or maintain a sense of human connection.
- Future fall detection research should focus on understanding user experience, incorporating user feedback into device designs, and minimizing false positives.
- AAL technologies could offer more reliable methods to detect cognitive decline or a decrease in ability to perform ADLs without relying on self-report.

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