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THE IMPACT OF FRAILTY ON THE EFFECTIVENESS OF ASSISTIVE TECHNOLOGIES (AT) – RESULTS FROM A SYSTEMATIC LITERATURE REVIEW

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Key Findings

Frailty is rarely considered to characterize older adults in studies evaluating AT.

AT were not effective in studies including frail older adults.

Personal disease management devices seem to be most effective for older adults.

Introduction

The demographic change and technological progress in many countries have fueled the hope associated with the use of assistive technologies (AT) for older and frail older adults (1). AT are designed to assist seniors, enable independent living, and improve quality of life by addressing age-related difficulties. We aimed to evaluate the effectiveness of AT for older adults and determine if frailty modifies the effectiveness of AT for older adults.

Methods

A systematic literature review of randomized controlled trials published between Jan 1st, 2009 and March 15th, 2019 was performed based on the PRISMA guidelines. The databases Medline, PsycINFO, SocIndex, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), and IEEEXplore were searched for studies evaluating AT that aim to support autonomy, communication, or safety of older adults with a mean age of ≥65. Studies conducted in a laboratory setting were excluded. Using recommendations published by Brefka et al. (2), studies were retrospectively categorized for the frailty status of participants.

Results

11.399 records and 54 full texts were screened (Figure 1). 19 heterogeneous trials, covering six device categories, were identified: Mobility, personal disease management (PDM), medication, mental support, hearing, and vision (Figure 2).

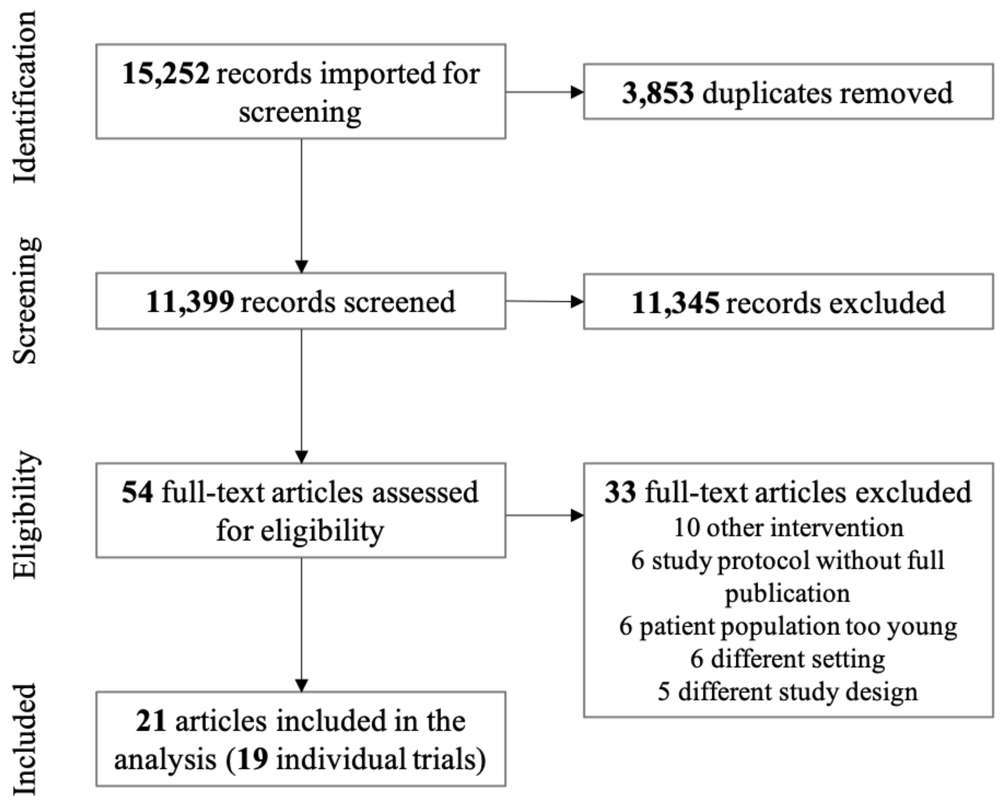

Figure 1. PRISMA diagram for the study selection process

Nine trials were conducted as pilot studies. Only one study did a frailty characterization (3). For six studies, frailty could be assessed retrospectively. PDM devices (e.g., for the management of chronic diseases such as diabetes) seem to be most effective with four studies showing significant improvement of relevant outcomes such as self-care or management of health parameters. Studies including significantly or severely impaired participants showed no effectiveness of evaluated AT (Figure 3). AT were also not effective in four studies conducted in nursing homes.

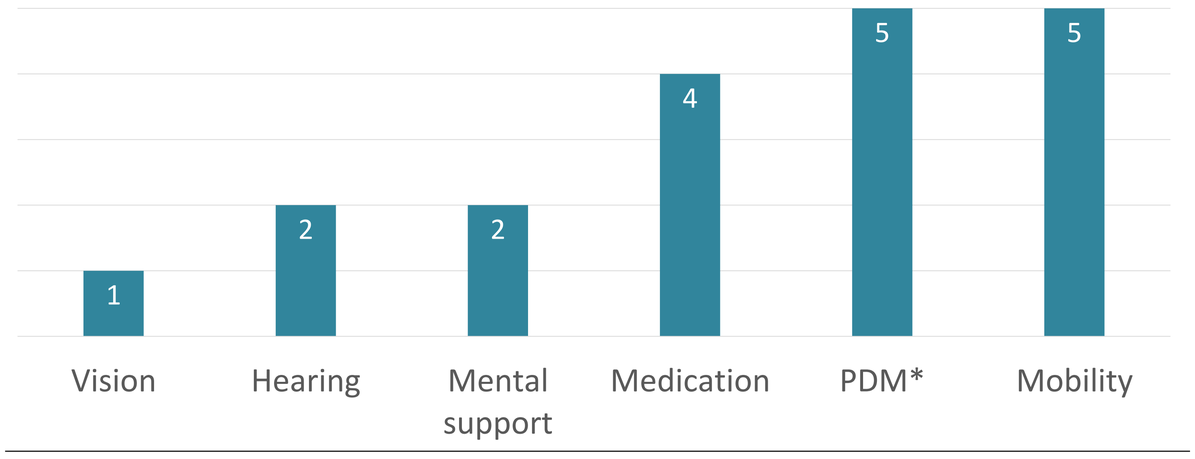

Figure 2. AT categories evaluated in the 19 included studies
*PDM: Personal Disease Management

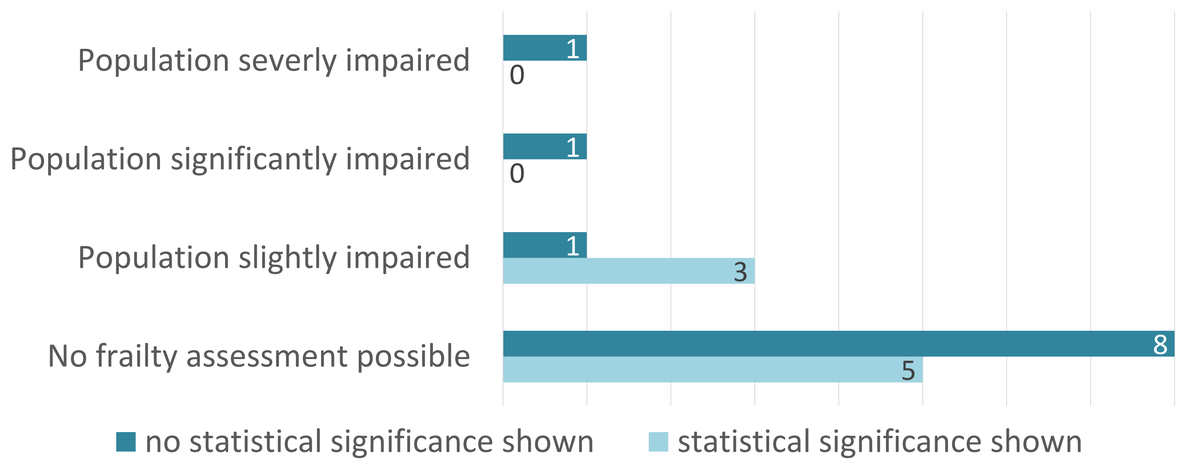

Figure 3. Included studies sorted according to the average frailty level of the study populations and statistically significant effectiveness of evaluated AT

Conclusion

High hopes are associated with the use of AT for older adults. PDM devices seem to be most promising judging from this analysis. For frail older adults, the evaluated AT might not (yet) be suitable. A lack of frailty characterization and high-quality research for AT were confirmed. Further research should include measures of frailty to increase the focus on this vulnerable group. The Medical Devices Regulation of the European Union (in force since May 2021) requires stricter controls and evaluation of medical devices. It can be expected that this will add momentum to the evaluation of AT for older adults and medical devices in general.

References

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