

Objective

- To assess the effects of pharmacist interventions on medication use and health outcomes in older adults with Alzheimer's disease or other dementias using published literature.

Methods

- Embase, PubMed, PsycInfo, CINAHL and ClinicalTrials.gov were systematically searched from inception to April 16, 2023, for articles published in English.
- Search terms used: "dementia," "ementia," "Alzheimer's Disease," "Alzheimer's," "pharmacist," and "pharmacists."
- Full-text articles that investigated the impact of pharmacist-led interventions on medication use and health outcomes in older patients with dementia or Alzheimer's disease were included in the final review.
- The National Institutes of Health Quality Assessment Tool was used to rate the quality of the included studies based on their study design.

Table 1: Characteristics of the Included Studies

Author, year, and country	Study design, quality rating	Length of follow-up	Outcomes
Moga 2017, USA	RCT, good	8 weeks	ACB and appropriateness of anticholinergics prescribing.
Huang 2022, Taiwan	RCT, fair	3, 6, 9 and 12 months	Medication persistence and adherence, QoL, caregiver's burden, and knowledge of dementia.
van der Spek 2018, Netherlands	RCT, fair	18 months	Appropriateness of psychotropics use in dementia, and APID sub-scores.
Gustafsson 2017, Sweden	RCT, good	30 and 180 days	Risk of drug-related hospital readmissions.
Gustafsson 2018, Sweden	Secondary analysis of data from RCT, good	30 and 180 days	Number of PIMs, incidence of all-cause ED visits, and time to institutionalization.
Sjölander 2019, Sweden	Secondary analysis of data from RCT, good	30 and 180 days	Number of drug-related readmissions and cost.
Pfister 2017, Sweden	Secondary analysis of data from RCT, fair	180 days	Type and frequency of DRPs.
Poisson 2019, USA	RCT, good	6 and 12 months	QoL in AD; frequency of use of ED, hospitalization, and ambulance services by PWDs; caregiver depression score, caregiver burden score and self-efficacy.
Liu 2022, USA	Secondary analysis of data from RCT, good	12 months	Number of PIMs, PIMs to be avoided in dementia or cognitive impairment, CNS-active drugs, total number of medications, number of prescriptions and ACB .
Sakakibara 2015, Japan	Controlled intervention, poor	3 and 6 months	QoL, ADL, and change in number of prescription drugs.
Mori 2021, Japan	Controlled intervention, poor	NR	Final dose of rivastigmine received during hospitalization, and Dose of rivastigmine brought-in drug
Kable 2020, Australia	Controlled intervention, fair	3 months	Time to hospital or ED readmission, medication DAAs utilized by patients after discharge and GP HMR requests/completion
Watanabe 2012, Japan	Controlled intervention, fair	1 year	Understanding of AD and donepezil by patients and caregivers; MPR
Wilchesky 2018, Canada	Before-after, fair	4 months	Number of regular medications used and medication appropriateness.
Elbeddini 2022, Canada	Before-after, fair	3, 6 or 12 months	ADL, medication deprescription, adverse effects.
Balli 2021, Turkey	Before-after, good	4 months	Adherence to dementia treatment and dementia knowledge.
Child 2012, UK	Before-after, poor	NR	Reduction of dose or withdrawal of antipsychotic drugs.
Nanaumi 2015, Japan	Before-after , fair	NR	Number of DRPs identified and resolved by the pharmacist. Adherence to donepezil and caregivers' understanding of donepezil and dementia treatment.
Efjestad 2019, Norway	Before-after, fair	NR	ACB
Rojas-Fernandez 2003, USA	Before-after, poor	1 month	BEHAVE-AD, drug-related side effects
Forgerini 2022, Brazil	Before-after, fair	6 months	Resolution of DRPs and control of physical and biochemical indicators.
Maidment 2018, UK	Before-after, poor	6 months	NPI-NH, medication reviews recommendations, and implementation.
Coli 2022, USA	Before-after, good	NR	Frequency and prevalence of PIMs, acceptance rate of pharmacists' recommendations by prescribers and ACB.
Swain 2012 USA	Before-after, poor	NR	Number and type of therapeutic suggestions provided by the pharmacist and patient satisfaction.
Mori 2022, Japan	Retrospective cohort study, fair	NR	Proportion of sleep medications-BZDs, n-BZDs, n-GADs-used during hospitalization and discharge.

Pharmacists' interventions

- Medication reviews
- Medication reconciliations
- Counseling/education for patients and caregivers, patient monitoring
- Anticholinergic burden evaluation
- Development of new medication plans
- Referrals and recommendations to other healthcare providers.

Key findings

- Evidence shows that the interventions were effective in reducing potentially inappropriate medications, improving the appropriateness of anticholinergic and psychotropic medications, and reducing drug-related problems.
- Effects of pharmacists’ interventions on improving adherence to treatment, patients' quality of life, medication persistence rate, and reducing emergency department visits were inconsistent.
- More than 50% of the pharmacists' recommendations were successfully implemented.

Limitations

Only full-text articles published in English and indexed in five databases plus one register were assessed. Only 7 out of 25 reports were rated with “good” quality.

Conclusion

Future studies should aim to develop more robust interventions that can address the inconsistencies in the effectiveness of pharmacist-led interventions.

Acknowledgement

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ACB- anticholinergic cognitive burden, QoL- quality of life, APID- appropriate drug use in dementia, PIMs- potentially inappropriate medications, ED- emergency department, DRPs- drug-related problems, AD-Alzheimer's disease, PWD- persons with dementia, CNS- central nervous system, ADL- activities of daily living, DAAs- dose administration aids, GP- general practitioner, HMR- home medicines review, MPR- medication persistence rate, BEHAVE-AD- behavioral pathology in Alzheimer's disease, NIP-NH- neuropsychiatric inventory- nursing home version, BZDs-benzodiazepines, n-BZDs- non-benzodiazepines, n-GADs- non gamma-aminobutyric acid receptors agonist drugs.

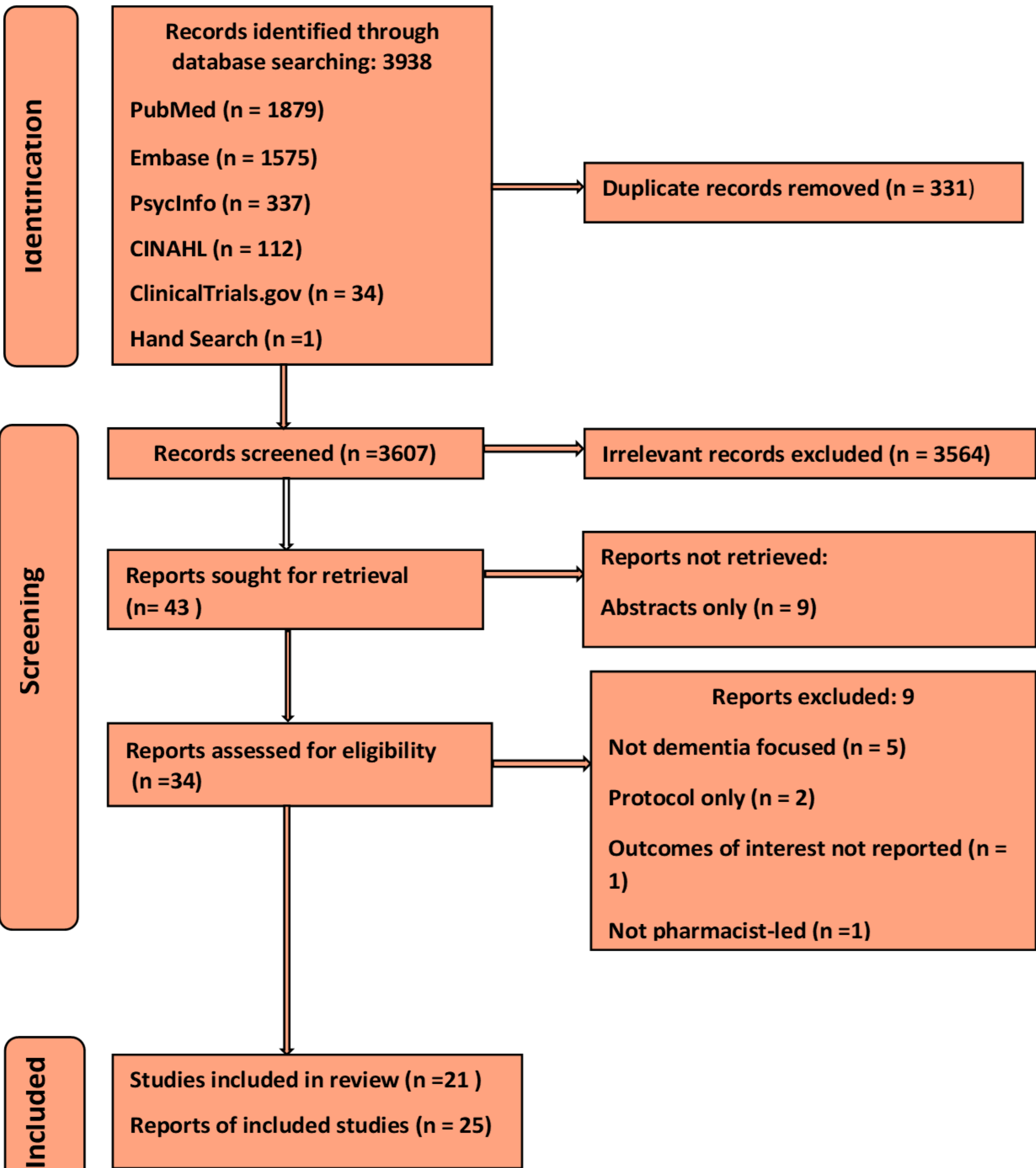


Figure 1: Flow chart showing the review process.