

The Prevalence and Impact of Polypharmacy and Potentially Inappropriate Medications in Australian Residential Aged Care Facilities: A Narrative Review

Original Research

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ABSTRACT

Background: Polypharmacy is the simultaneous use of five or more regular daily medications. The older population may be more susceptible and vulnerable to the negative impacts of polypharmacy. The number of older patients living in residential aged care facilities (RACFs) across Australia is increasing, which proportionally increases their risk of being prescribed a Potentially Inappropriate Medication (PIM). The prevalence of PIMS is increased in conjunction with polypharmacy. They increase the risk of patient hospitalisation and harm, which therefore increases the burden on the healthcare system.

Aim: To identify the prevalence and impact of polypharmacy and PIMs in RACF patients, to examine the risks and suggest possible solutions to decrease patient harm across Australia.

Method: A critical analysis and synthesis of pre-existing literature from academic library databases was utilised to develop themes and acknowledge gaps in the literature. The databases used were Ovid MEDLINE, Emcare Ovis, Scopus, Web of Science, Clinical Key and DynaMed.

Results: The studies identified a significantly high rate of inappropriate prescribing causing potential patient harm, especially in the older population of Australia. Psychotropic medications were of particular concern.

Conclusion: Older patients in Australian RACFs are at higher risk of harm from medication misadventures due to polypharmacy and the use of PIMs. However, this risk can be decreased through the implementation of future workplace policies that include a standard for thorough and detailed patient medication reviews.

INTRODUCTION

The global population is ageing, with the estimated proportion of people over the age of 60 to reach 22% by 2050, compared to 12% in 2015.¹ As the population ages, the prevalence of comorbidities increases, with the most common conditions including arthritis, dementia, chronic pain, chronic obstructive pulmonary disease

(COPD), diabetes and mental health.^{1,2} The presence of comorbidities can warrant therapeutic considerations such as the need to commence pharmacotherapy.^{1,3} Due to this, medication reliance has increased. The healthcare sector is significantly impacted by the ageing population, especially due to the larger demand for pharmacotherapy and aged care providers.⁴

Between the years of 2011 to 2021, there was an 11% increase in the number of older people using a permanent residential aged care facility (RACF) across Australia.⁵ In 2020 alone, the Royal Commission into Aged Care Quality and Safety identified that over 100,000 elderly patients were waitlisted for aged care access.⁶ This demonstrates that a large proportion of patients rely on healthcare workers at the facility to manage and monitor their medications, which often leads to improper medicine use. In general, RACF patients are seen taking more medications than the older population residing in the community setting, and thus are more vulnerable to the impacts of polypharmacy. Polypharmacy can be defined as the simultaneous use of five or more daily medications over a definitive or continued long-term basis.⁷ Furthermore, studies have found that up to 98% of patients living in aged care facilities are taking medicines that are inappropriate for older people.^{8,9} In order to determine the risk of inappropriate prescribing in this population, Beers criteria has been utilised.¹⁰ Beers criteria is a validated tool which identifies medications to be used with caution in the elderly, thus allowing the identification and classification of potentially inappropriate medications (PIMs).¹⁰

When used appropriately, medication prescribing improves patients' quality of life, increases life expectancy, reduces risk of health complications, and maintains the community's overall health.¹¹ However, inappropriate prescribing and PIM use has the ability to cause significant patient harm and negatively impacts both the population and healthcare sector. Inappropriate prescribing can be in the form of polypharmacy or medication usage when not indicated. When appropriate, prescribers should consider the implementation of non-pharmacological options before drug therapy is initiated.⁴ One of the most common examples of inappropriate prescribing is psychotropics, which have been found to account for almost half of all RACF PIMs.¹³ It is predicted that polypharmacy will continue to be a growing concern as more drugs are developed and life expectancy increases.¹¹ This puts strain on the healthcare system through increased rates of patient harm.¹³

Australia has successfully demonstrated the importance of medication safety as a topic of concern by recognising it as the tenth National Health Priority Area after the publication of the National Baseline Report on Quality Use of Medicines and Medicines Safety in 2019.¹⁴ Phase 1 of this report pertained to focusing on the ageing population and their issues of polypharmacy, inadvertent antipsychotic

use, and potential for improving transitions of care.¹⁴ This report followed the 2018 Royal Commission into Aged Care Quality and Safety announcement which recognised elderly abuse, neglect, substandard care and medication misadventures including inappropriate administration.⁶ Together, these reports focused on highlighting and improving the major issues in aged care, particularly accessibility, medication safety, and transitions of care.

Medication safety is evidently a growing concern in Australia.¹ Polypharmacy, PIMs and complex medicine regimes are medicine-related problems (MRPs), which have been recognised as posing the highest risk to the older population due to their vulnerability, altered pharmacokinetics and pharmacodynamics, and higher prevalence of medical conditions.⁶ This narrative review aims to search current literature to examine the prevalence and impact of polypharmacy, identify common PIMs and explore current inadequacies in medicine use in Australian RACFs. The purpose is then to understand the importance of implementing certain practices and workplace policies to improve patient safety in a RACF setting.

METHOD

The method used to construct this review consisted of a literature search and a critical analysis and synthesis of pre-existing articles regarding the relevant concepts. Published journal articles were targeted and their methodology was examined for quality. Exclusion criteria consisted of opinion pieces, systematic reviews, editorials or letters, and data was limited to "humans." The date range was set to publications from 2018 onwards and language set to English. For the purpose of this literature review, the databases used to acquire the articles were Ovid MEDLINE®, Emcare Ovis, Scopus, Web of Science, Clinical Key and DynaMed. To narrow the search results, the following keywords were used as guidance: "polypharmacy", "elderly", "older population", "residential aged care facilities", "Australia", "potentially inappropriate medications", "patient harm", and "chemical restraints". Articles were assessed for relevance by their title and abstract before being chosen for this review. Each identified article was examined, and the general, recurring themes were noted and extracted.

The included articles were original studies conducted in RACFs across Australia based predominantly in major cities of Queensland (QLD), New South Wales (NSW), Victoria

(VIC), South Australia (SA), and Western Australia (WA). The studies analysed qualitative and quantitative data from patient prescribing and dispensing histories to identify trends in polypharmacy and PIMs in elderly RACF patients. The major themes ranged from broader polypharmacy to specific medication analysis. The participants all consented, and the Human Research Ethics Committee (HREC) of each state granted permission to conduct each study respectively. For this review, the content has been divided into three major sections to reflect each aspect of the aim — discussing polypharmacy and PIMS, psychotropic medications and potential solutions.

RESULTS AND DISCUSSION

Medicine-Related Problems (MRPs) in the Elderly

MRP is a broad term used to describe situations involving the use of medicines which may prevent a patient from experiencing optimal health care by inadvertently contributing to increasing their risk profile.⁹ PIMs represent any medication with a higher risk of patient harm when compared to its potential therapeutic benefit.^{12,15,16} If a PIM presents in combination with polypharmacy, a considerable MRP is likely. Further, MRPs can include sub-optimal drug selection, compliance issues, and inadequate monitoring or education for both health workers and patients.⁹ Various studies have identified older patients residing in RACFs to be most at risk of medicine related harm.^{15,16} Up to 74% of RACF patients in Australia take at least ten daily medications, highlighting the issue of polypharmacy.^{12,15,16,17} Internationally, the rates for PIM exposure in RACFs is 43%, compared to a study conducted across NSW and WA, where the rate of residents exposed to a minimum of one PIM was almost double, at 83%.¹⁶ It has been found that 98% of residents in Australian RACFs have at least one MRP, with the most common risks being toxicity or adverse reactions.⁹ This greater risk of exposure to PIMs is more likely for patients in an RACF compared to those in a community setting due to the likelihood of multiple prescribers, miscommunication between health professionals, and overprescribing upon admission.^{13,16} MRPs increase the risk of patient harm through drug-disease and drug-drug interactions, which cause almost 30% of all hospital admissions in Australia.^{12,15} Of these hospital admissions, almost 25% of patients were admitted due to PIM issues and those specifically from RACFs were exposed to at least one PIM which was deprescribed upon discharge.^{12,17} The identification of PIMs was achieved

through the implementation of a validated tool, including Beers Criteria.¹⁰ As suggested before, many research studies use the guidelines of Beers Criteria to identify high risk prescribing in older patients, and thus identify the presence of PIMs.^{15,16,17,18} Based on these studies conducted in a variety of facilities across Australia, the following drug classes were ascertained to be the most common PIMs: long term use of proton-pump inhibitors (PPIs), colesticaliferol (vitamin D), benzodiazepines, central nervous system active drugs, opioids, anticholinergics and antipsychotics.^{15,16,18,19} The most common reasons for the classification as a PIM was a lack of justified reasoning behind the indication, improper adherence to national guidelines, or a drug or disease state contraindication.¹⁶ Examples of adverse effects from a PIM can be seen in a patient taking a PPI for a prolonged duration which increases the risk of *Clostridium difficile* (*C. diff*) infection, pneumonia, bone fractures and acute or chronic kidney disease.^{15,20} Of the identified medications, however, the most significant issue in RACFs was associated with PIMs in relation to psychotropic medications in the management of dementia.²¹

RACF and Psychotropic Medications

Over half of the population residing in Australia's RACFs are diagnosed with dementia.^{12,21} Of these patients, 90% experience behavioural and psychological symptoms of dementia (BPSD), which significantly increases the stress on RACF employees and the likelihood of patient hospital admissions.²¹ Similar to the prevalence of PIMs, there are higher rates of BPSD present in RACF settings compared to the wider community.¹⁸ Harmful medicine-related effects are more likely to occur in patients with dementia due to the inappropriate prescribing of psychotropics including antipsychotics, benzodiazepines and antidepressants.^{12,19}

Furthermore, it has been found that, of the prescribed antipsychotics, 61.5% were prescribed for depression, 26.7% for anxiety, 25.4% for insomnia, 13.7% for agitation, 11% for psychosis, and 7.2% for behaviours that needed management.¹⁸ The dementia patient proportion of this study was frequently prescribed medication for agitation and psychosis and less likely to receive medication to overcome sleep difficulties.¹⁸ These patients were therefore prescribed a higher level of medications for symptoms that should be managed non-pharmacologically, while their sleep issues remained unaddressed. This increases the risk of polypharmacy while not providing therapeutic benefit.²²

A study examining the change of psychotropic dispensing

pre- and post-patient transfer into a RACF identified an increase in the use of antipsychotics, benzodiazepines, and antidepressants by 6%, 17%, and 27% respectively, within the first three months of relocation.¹⁹ Patients with a history of dementia had a higher prevalence of psychotropic dispensing despite the evidence, which suggested that these medications have no proven efficacy over a placebo.^{19,21} This therefore increased patients' risk of harm due to polypharmacy with modest therapeutic benefit. Patient relocation into an RACF was identified to cause patient distress and anxiety due to being in a new environment, and a readjustment period was often required.¹⁹ The first line management of these symptoms according to clinical guidelines is non-pharmacological options, which includes formulation of patient specific therapies to improve BPSD.^{18,19,22} Australian clinical practice guidelines including the Therapeutic Guidelines (eTG) suggest non-pharmacological strategies to manage BPSD should be the primary consideration, and that drug therapy should only be used if required in addition to the existing non-pharmacological approaches for the shortest time possible with regular monitoring.^{21, 23}

This concerning prevalence of psychotropic overprescribing has been an ongoing concern in Australia since the first study conducted over 20 years ago.²² Following this, there has been an increased awareness of the use of chemical restraints in RACFs. In 2015 the Australian Government Therapeutic Goods Administration (TGA) and eTG were updated to state that the only approved antipsychotic for BPSD specific to Alzheimer dementia patients was risperidone, with its use restricted to a maximum of 12-week intervals.^{20,21,23} Previously, risperidone accounted for over half of psychotropics prescribed in RACFs and a study was conducted to assess the efficacy of the updated TGA guidelines.¹⁸ It was conducted over a 12-month period across Australia and showed that the dispensing rates of risperidone decreased significantly and the prevalence of secondary health issues including risperidone-related fractures and pneumonias were also decreased.²¹ However, in most cases, the timeframe of use per patient exceeded the 12-week maximum and continued to depict concern for off-licence psychotropic prescribing, regardless of the decreased level of risperidone-related harm.^{20, 21}

It was estimated that only 10% of prescribed and dispensed psychotropics in RACFs were therapeutically appropriate.¹⁹ Use of inappropriate psychotropic drug therapy for management of BPSD caused impaired patient balance and cognition and increased the patients' risk of hospitalisations, falls, stroke, cardiovascular events and pneumonia.^{12,15,22} On average, at least

one in five dementia patients were prescribed at least one regular antipsychotic or benzodiazepine, and almost all were exposed to a PIM.^{12, 21} Furthermore, in combination with the regular prescribing of these medications, the majority of patients were also charted a "when required", or pro re nata (PRN), dose of antipsychotics and/or benzodiazepines.²² In some cases, although the regular dosing was decreased, the rate of PRN dosing increased, leading to higher rates of polypharmacy, drug interaction risk, and the potential for the total drug doses to exceed the recommended maximum. Of all recorded PIMs, 68% were regular medications and 34% were PRN medications.¹⁵

Solving the Issue of PIMs and Potential Medication Misadventures

Reducing the number of PIMs present in RACFs would decrease the risk of patient harm and positively impact the Australian healthcare system.¹⁹ Key processes that should be undertaken include using minimum duration therapy, deprescribing PIMs when practical and safe, and developing new guidelines. Deprescribing can be defined as the supervised withdrawal of a PIM to improve the quality of life of a patient through decreased medication risk.¹⁶ PIMs often remained unaltered and continued as regular medications due to a lack of time for GPs to intervene and nursing staff not having enough medication knowledge to bring up a deprescribing conversation.²² As medication experts, it has been found that the integration of a pharmacist into RACFs decreased the average patients' regular medications from ten to six through pharmacist-led medication reviews and initiation of deprescribing.^{15,16,20} This significantly decreases a patient's risk of polypharmacy and can be achieved through the development of a medication withdrawal plan on consultation with a multidisciplinary team.^{16,19} The process of deprescribing involved tapering down medications in two to four week intervals which required strict monitoring for adverse effects and checking of correct decreasing doses. This process was very time consuming and, in combination with staffing pressures, could have contributed to the high prevalence of PIMs in RACFs.¹⁵ Furthermore, optimising the patient's transition of care into an RACF setting would decrease the risks of miscommunication between health professionals and thus MRPs.²⁴

In relation to psychotropic PIMs, education sessions for management of BPSD could be implemented to focus on

non-pharmacological therapies to decrease the prevalence of psychotropic use.¹⁸ Overall it can be concluded that a thorough implementation of multifactorial strategies would improve medicine usage within a RACF setting²¹

CONCLUSION

The issue of polypharmacy, and the prescribing and dispensing of PIMs within RACFs has been highlighted as an ongoing healthcare concern in Australia. The high prevalence of PIMs has been shown to cause substantial patient harm through hospitalisation and secondary health issues which increases the healthcare burden. The significant increase in psychotropic medication initiation upon RACF admission proves to be the source of most medication-related harm and inappropriate prescribing. These issues could be resolved with the development of strict guidelines and future policies, embedding pharmacists in RACFs, deprescribing, and a focus on prioritising non-pharmacological therapy over pharmacological interventions when and where appropriate. Further studies across Australia should be conducted to identify any similarities or differences in the presence of PIMs in rural and remote communities, which were not considered in the articles examined in this review. Overall, elderly patients remain at risk of most harm from medication-related problems and this review assessed the prevalence of the most common PIMs and identified improvements for this patient population.

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