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# NAVIGATING POLYPHARMACY IN AGING POPULATIONS: A SYSTEMATIC REVIEW OF DEPRESCRIBING INTERVENTIONS AND ITS IMPACT ON CLINICAL OUTCOMES

*Narrative Review*

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## ABSTRACT

**Background:** Polypharmacy, prescription of five or more drugs, is common in geriatric care and has been linked to increased risk of adverse drug reactions (ADRs), hospitalization, and reduced quality of life. Deprescribing, a structured approach to supervised discontinuation of inappropriate medications, is a growing trend but remains a debatable notion due to lack of consensus and literature gaps. The objective of this narrative review was to summarize the evidence related to the impact of deprescribing interventions on clinical outcomes.

**Methods:** Systematic searching of PubMed, Cochrane Library, ClinicalTrials.gov, and the WHO International Clinical Trials Registry was done. Studies were then categorized according to study designs with 10 randomized controlled trials (RCTs), 7 cohort studies, and 11 systematic reviews. Studies without a comparator group, qualitative studies, and case reports were excluded. Due to the given heterogeneity of studies, a narrative synthesis of study results was done, and outcomes were summarized according to subgroups (patient characteristics, intervention type and setting). Four major outcomes were assessed, which included adverse drug reactions, hospitalization rates, medication Burden, and Quality of Life. Bias was assessed according to the Newcastle-Ottawa Scale for observational studies and Cochrane Risk of Bias Tool (ROB 2) for RCTs.

**Results:** Results of the Deprescribing interventions in older adults have yielded mixed outcomes across various health parameters. While many studies highlight various benefits of deprescribing such as reductions in adverse drug reactions (ADRs) and medication burden (McDonald et al., 2022; Quek et al., 2024), other studies report limited or no significant effects on hospitalization rates and quality of life (Ibrahim et al., 2021; Jackson & Patel, 2020). Differences in various study designs, populations, and methodologies of the included studies may lead to these inconsistencies. Therefore, standardized protocols and further research is imperative to fully recognize and optimize the effect of deprescribing interventions.

**Conclusion:** Despite the advantages of deprescribing, heterogeneity of protocols, inconsistent reporting of outcomes, and short follow-ups limit the evidence. Standardized guidelines and longer studies are required to optimize deprescribing.

**Keywords:** deprescribing interventions; clinical outcomes; narrative synthesis, older adults; polypharmacy; systematic review.

## INTRODUCTION

The growing incidence of chronic diseases like diabetes, cardiovascular disease, and hypertension has raised concerns about polypharmacy, defined as the use of five or more drugs in the elderly [1]. Though many drugs might be needed for optimal disease management, but too many drugs have been linked with ADRs, drug-drug interactions, falls, hospitalization, and higher mortality [2]. Physiological changes that accompany aging, like decreased drug metabolism and renal clearance, increase the risk of drug-induced harm and make polypharmacy a cause of public concern [2].

Deprescribing is a growing trend to optimize medication use among the elderly by systematically withdrawing inappropriate or unnecessary medications under proper clinical guidance [3]. Deprescribing aims to optimize the balance between the risks and benefits of continued medication use with maintenance or enhancement of clinical outcomes [4]. While it is widely recognized, deprescribing is not extensively practiced in everyday practice due to physician resistance, patient concern over withdrawal from medication, and unavailability of evidence-based deprescribing guidelines [5,6]. Additionally, inconsistency in deprescribing strategies among studies and paucity of long-term outcome data have deterred widespread application.

The problem of polypharmacy has been studied extensively and there have been several systematic reviews, and RCTs, examining the potential benefits of the completion of deprescribing interventions, including reduction in ADRs, enhanced medication adherence, and reduced hospitalizations [7]. Yet, results are not consistently reported across studies and vary depending on the study design, the studied patient groups, and intervention strategies. It is necessary to carry out a systematic review of the current evidence base to assess the clinical impact of deprescribing and systematically evaluate the effect of deprescribing interventions compared with clinical outcomes, ADRs (Adverse Drug Reactions), hospitalization or emergency department visits, drug adherence, and QoL (Quality of Life) to inform evidence-based practice and policy.

## METHODS

### Selection Criteria and Literature Search Strategy

This systematic review employed strict eligibility criteria to ensure that only pertinent and high-quality studies were included. It focused on adults aged equal or more than 65 years in primary care, outpatient attendance, or community settings. The review included studies that discussed deprescribing methods, such as medication review by clinicians, deprescribing interventions by pharmacists, and physician-led tapering of medications. They were compared with patients treated with continued polypharmacy. The outcomes assessed were reductions in adverse drug reactions, hospitalization, medication adherence, mortality, and quality of life. Study designs considered were randomized controlled trials (RCTs), cohort studies, and systematic reviews of deprescribing interventions. Excluded studies were case reports, expert views, qualitative research, and conference abstracts, in addition to the studies with absence of a comparator arm. For proper assessment of the outcomes, the studies were categorized with reference to study designs and deprescribing approaches, which were pharmacist-led, physician-led, multidisciplinary team-based intervention, and electronic decision-support interventions. A comprehensive literature search was conducted on PubMed, ClinicalTrials.gov, and reference lists and grey literature of relevant studies to limit publication bias. The most recent search was dated February 1, 2025.

### Extraction of data

A systematic search strategy was designed using Medical Subject Headings (MeSH) and Boolean operators to ensure optimal sensitivity and specificity. Example PubMed search:

*("Deprescribing" OR "Polypharmacy Reduction" OR "Medication Discontinuation") AND ("Older Adults" OR "Geriatrics" OR "Aged 65+") AND ("Adverse Drug Reaction" OR "Medication Burden" OR "Hospitalization").*

Search filters were applied to limit results to studies published after 2014. The screening process employed a multi-step method. Two reviewers independently screened titles and abstracts of all studies identified. Then the eligible studies underwent an independent full-

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text assessment by the same assessors. Duplicate records were excluded using EndNote. The data extracted was checked for consistency by a third reviewer.

**Statistical Analysis**

The primary outcome measured was the reduction of adverse drug reactions (ADRs), and secondary outcomes included hospitalization rate, medication adherence, mortality, and quality of life. Other variables collected included patient factors such as age, sex, comorbidities, and number of baseline medications, and data on the deprescribing intervention, follow-up duration, and study site. Synthesis of data involved classification of studies by the nature of deprescribing intervention, study design, and population setting. Outcomes were presented using tabulated summary statistics and organized plots to present deprescribing effectiveness. Since meta-analysis could not be conducted due to heterogeneity in settings, deprescribing strategies, and outcome definitions, a narrative synthesis was performed. Heterogeneity was also explored through subgroup analyses comparing pharmacist-led vs. physician-led deprescribing interventions, and sensitivity analyses were performed to exclude studies with high risk of bias.

**Risk of Bias Assessment**

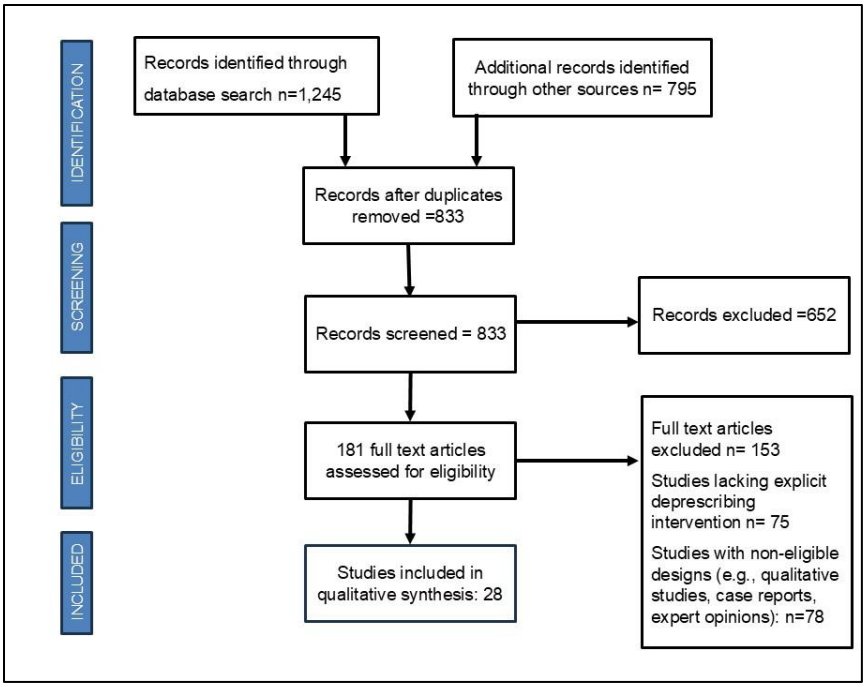
The Cochrane Risk of Bias Tool (ROB 2) was applied to assess the risk of bias in randomized controlled trials (RCTs) on areas such as randomization, concealment of allocation, blinding, and attrition. Observational studies were evaluated utilizing the Newcastle-Ottawa Scale, which scrutinized participant selection, comparability, and measurement of outcomes. Two independent authors performed all the bias evaluations with any discrepancies agreed by consensus. Reporting bias was tested using funnel plots and Egger's test to identify publication bias, while selective outcome reporting was tested through evaluation of studies for inconsistencies between reported outcomes.

**Results:**

**Study Selection**

The initial PubMed search identified 1,245 records. 412 duplicates were removed, and 833 records remained for title and abstract screening. Out of the 833 records, 652 records were removed based on pre-specified eligibility criteria, leaving behind 181 full-text articles for thorough evaluation. Of these, 154 were removed, with 75 studies lacking explicit deprescribing intervention and 79 having study designs that were not fulfilling inclusion criteria, e.g., qualitative studies, case reports, and expert opinions. Finally, 28 studies were incorporated into this systematic review. The PRISMA flow diagram of study selection section is shown in Figure 1.0

**Figure 1.0**




**Study Characteristics**

The following types of studies were included

- 10 randomized controlled trials (RCTs)
- 7 cohort studies
- 11 systematic reviews are included

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Sample size ranged from 100 to 3,904 participants, and follow-up ranged from three months to two years. Most of the included studies were conducted in primary care, whereas other studies tested deprescribing interventions in outpatient clinics and nursing homes. The tables (1.0, 1.1, 1.2) show a summary of the study characteristics including author, year, design, outcome and key results

**Impact of Deprescribing Interventions on Adverse Drug Reactions**

Most of the studies highlighted a significant reduction in adverse drug reactions (ADRs) following deprescribing interventions. For instance, the MedSafer Study, which was a cluster randomized clinical trial conducted by McDonald et al. (2022), assessed the impact of an electronic decision support tool for deprescribing in hospitalized older adults. Further, Seto et al. (2022) conducted studies wherein a significant reduction in potentially inappropriate medications (PIMs) and standard medicines was found in geriatric orthopedic inpatients, marking a reduction in probable ADRs. Ibrahim et al. (2021), on the other hand, conducted a systematic review that determined no significant difference in adverse effects with deprescribing interventions. While most of the studies demonstrated that deprescribing reduces ADRs negatively affecting the clinical outcomes, some studies did not report significant reductions in adverse events. Variations in study population, design, and drug in question may explain these variations.

**Effect of Deprescribing Interventions on Hospitalization Rates**

Deprescribing has also been associated with decreased hospitalization. For instance, a cohort study by Garfinkel et al. (2010) reported a decline in emergency visits following deprescribing interventions. Lee et al. (2024) have also conducted a study whose results will measure hospitalization rates following deprescribing; findings are yet to be published since the study is ongoing.

However, Bloomfield et al. (2020) conducted an intensive review of medications and concluded that it did not influence or had little impact on hospitalization. Additionally, Patel (2020) confirmed no difference in hospital admission among intervention and control groups following deprescribing. From the above results, it shows that even though deprescribing could aid in obtaining patient stability and reducing healthcare utilization, its effects on hospitalization rates vary in different studies.

**Effects of Deprescribing Interventions on Medication Burden**

Deprescribing was also reported to reduce the prescribed drug count without worsening disease control. A mean reduction of 2.1 drugs prescribed per patient was identified by Page et al. (2016) in an RCT ($p<0.001$). A cohort study conducted by Russell et al. (2021) revealed that lowering the drug burden over a period of 12 months yielded better medication compliance. These findings highlight the practicality of deprescribing as an efficacious means to manage polypharmacy. Similarly, studies by Seto et al. (2022) found that decreasing potentially inappropriate medications (PIMs) in orthopedic inpatients resulted a decrease in likely harmful drug effects. Likewise, Jovevski et al. (2023) reported an increase in the rate of deprescribing considerably thereby suggesting growing recognition of its benefits.

Furthermore, a systematic review by Page and Potter (2021) reported a significant decrease in potentially inappropriate medication and total number of medicines per patient, further necessitating the role of deprescribing in reducing overall treatment regimens. These studies underline the importance of deprescribing interventions in reducing burden of medications and improving patient outcomes.

**Effect of Deprescribing Interventions on Quality of Life**

Deprescribing has been linked with patient-reported quality of life (QoL) improvements. As revealed in a Systematic review by Shrestha et al. (2021), deprescribing lead to better physical and mental wellbeing, especially among older multimorbid patients. Similarly, Potter et al. (2016) reported in a randomized controlled trial (RCT) regarding significant improvement in mobility and daily functioning in the deprescribing group as compared to control group. Garfinkel's study (2024) also reported enhanced satisfaction and cognitive status in the poly-de-prescribing (PDP) group. On the other hand, Bloomfield et al. (2020) highlighted that the impact of comprehensive medication reviews was little on health-related quality of life. Furthermore, Russell et al. (2021) reported no deterioration in health-related quality of life associated with deprescription of medications.

These results reveal that deprescribing interventions do have beneficial effects on QoL and functional outcomes, but these effects may vary depending on the study design, population, and methods.

**Risk of Bias in Included Studies**

Risk of bias was assessed according to the Newcastle-Ottawa Scale for observational studies and the Cochrane Risk of Bias Tool (ROB 2) for randomized controlled trials (RCTs). Of the 10 RCTs that were included, six trials were at low risk of bias and two trials were a

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concern for several reasons such as problems with allocation concealment and blinding of participants and study staff. Two trials were at a high risk of bias due to high levels of participant dropout, selective reporting of outcomes, and inadequate randomization processes.

Out of 7 cohort studies, 4 were of good quality by strictly following main participant selection, comparability, and outcome assessment criteria, while 3 were moderate quality because of potential confounders, follow-up durations of less than ideal, and variability in reporting the outcome. Blinding procedures were not explained in detail in some studies, thereby with a greater chance of performance bias. In addition, some of the cohort studies had non-uniform follow-up intervals, which could have introduced heterogeneity in the outcome assessment.

## DISCUSSION

The findings of this systematic review align with the literature that supports deprescribing as a method for improving medication safety and reducing adverse effects related to polypharmacy in the elderly [8]. Similarly, studies suggest that deprescribing interventions correlated with a better quality of life and reduced hospitalizations [9,10,11]. Pharmacist interventions were more effective, particularly in lowering inappropriate use of medications and improving compliance, verifying the growing contribution of pharmacists to medication optimization [12]. Multidisciplinary approaches, including physicians, nurses, and computerized decision-support systems, also worked well to aid deprescribing success [8,13,14].This study also reinforces that there is strong evidence that deprescribing interventions reduces the medication burden. Some studies show a decrease in emergency department visits following deprescribing [15], while others report no significant change in hospitalization rates [16,17]. These discrepancies may be due to variations in study populations, medications, and intervention durations. It is also possible that factors such as patient comorbidities, clinical judgment, and the complexity of individual treatment regimens may influence the effectiveness of deprescribing interventions on hospitalization rates [18].

On the other hand, the effects of deprescribing on reducing the number of prescribed medications are consistently positive [19]. Multiple studies demonstrate significant reductions in medication burden [20], leading to improved medication adherence and fewer adverse drug reactions, particularly in older adults [21]. The reduction in potentially inappropriate medications emphasizes the safety benefits of deprescribing [22], especially among populations at higher risk of polypharmacy-related complications. These findings suggest that deprescribing not only optimizes medication regimens but may also enhance the quality of life by reducing medication-related harm [23]. Overall, while the impact on hospitalization rates remains variable, deprescribing proves effective in optimizing medication regimens, reducing medication burden, and enhancing patient outcomes [24]. Given the growing body of evidence supporting its benefits, deprescribing could be considered an essential component of patient-centered care [25]. Studies with longer follow-up periods and standardized deprescribing protocols are supposed to better understand its broader impacts the burden of polypharmacy and PIMs [26].

Despite these benefits, heterogeneity among deprescribing protocols, patient populations, and follow-up durations was the cause of variability in outcomes [27,28]. Some studies did not find significant improvement in quality of life, possibly due to short follow-up or inappropriate measurement tools [28,29]. Additionally, problems with patient resistance, prescriber reluctance, and lack of standardized deprescribing guidelines remained barriers to widespread implementation [30]. Our findings reinforce the need for standardized deprescribing protocols, better integration of clinical decision-support tools, and long-term follow-up studies to assess sustained effects on clinical outcomes and patient health [31,32]. Deprescribing was associated with a reduction in hospitalization and is proven to be generally safe, but its effects on mortality remain inconclusive [33.34]. Therefore, medication withdrawal needs a structured, standardized approach to prevent fatal outcomes and enhance potential benefits [35,36]. A randomized clinical trial explored deprescribing from hospitalization through post-acute care and found that structured medication discontinuation strategies improved medication appropriateness without compromising patient safety [37].

### Limitations

Despite the promising results, several limitations were observed in the included studies. There was significant heterogeneity in study design, including variations in deprescribing protocols, mode of delivery of interventions, durations of follow-up, and outcome measures, such that direct comparisons were challenging. Majority of studies included short-term follow-up periods of less than 12 months, and this prevents comprehension of the longer-term sustainability of deprescribing interventions and their clinical effectiveness. Studies also tended to include a few, if any, patient-reported outcomes like symptoms, functional status, or self-reported states, reducing

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information about deprescribing's widespread impact. It emphasizes a need for generic deprescribing algorithms, extended follow-up trials, and more focus on measurement of patient-level outcomes.

Despite strict adherence to PRISMA 2020, the review is not flawless. Publication bias may have influenced the findings because studies with favorable results are more likely to be published, potentially resulting in overestimation of the advantages of deprescribing. The heterogeneity of interventions and outcomes excluded a meta-analysis, and instead a narrative synthesis was opted. Restriction to studies published in the English language may have excluded relevant studies published in other languages.

**Implications for Practice, Policy, and Future Research**

Systematic deprescribing procedures must be integrated into regular clinical practice workflows to improve medication safety and patient outcomes. Pharmacist interventions must be scaled up since it has been demonstrated to decrease inappropriate use of drugs, ADRs, and hospitalization. Shared decision-making designs must be implemented for deprescribing to become patient-preferred, disease-state targeted, and targeted toward long-term care goals. Automated advanced clinical decision-support systems must be integrated into electronic health records to improve real-time medication review and deprescribing recommendations.

National and global deprescribing guidelines need to be harmonized to provide clear, evidence-based advice for clinicians. Deprescribing should be incorporated into quality and safety initiatives so that drug optimization is an integral healthcare. Education programs should be developed for healthcare workers to improve deprescribing competence and patient engagement in stopping medicines. Longitudinal studies are important for evaluating the long-term impact of deprescribing on mortality, morbidity, and healthcare utilization. Economic analysis must be conducted to determine the cost-effectiveness of deprescribing, particularly in reducing hospitalization and healthcare expenditure.

## CONCLUSION

This systematic review presents strong evidence that deprescribing interventions in the elderly strongly reduces adverse drug reactions (ADRs), lower rates of hospitalizations, and increase medication adherence and patient-reported outcomes. The findings strongly endorse formalized deprescribing programs, particularly those with pharmacists, which consistently registered higher efficacy in rationalizing drug regimens and improving patient safety. Multidisciplinary approaches, including physician-initiated and decision-support-enhanced deprescribing, also proved beneficial to promote meaningful harm reductions due to polypharmacy

As the number of elderly individuals rises and polypharmacy costs are escalating, deprescribing must be integrated into geriatric practice. If its adoption proves successful in regular clinical practice, it has the potential to immensely enhance patient safety, optimize pharmacotherapy, and reduce healthcare expenditure. This may be attained with multidisciplinary collaboration from clinicians, policymakers, researchers, and patients for development of evidence-based deprescribing programs and efficient implementation across the globe

**Registration Information**

This systematic review was registered in PROSPERO (CRD42025648992) before data extraction and analysis. The registration ensures transparency and observance of standardized reporting guidelines.

**Amendments to Protocol**

No significant amendments were made to the protocol after registration. Any adjustments in inclusion criteria and data synthesis methods were made in response to new evidence and were documented in the study records.

**Author Contributions**

| Author | Contribution |
|---|---|
| Nashwah Waheed* | Substantial Contribution to study design, analysis, acquisition of Data<br>Manuscript Writing<br>Has given Final Approval of the version to be published |
| Furqan Shahid | Substantial Contribution to study design, acquisition and interpretation of Data<br>Critical Review and Manuscript Writing<br>Has given Final Approval of the version to be published |
| Shahzeb Leghari | Substantial Contribution to acquisition and interpretation of Data<br>Has given Final Approval of the version to be published |
| Musab Maqsood | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Dania Rizwan | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Saima Khalil | Substantial Contribution to study design and Data Analysis<br>Has given Final Approval of the version to be published |

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**Summary Tables**

**Table 1.0**

**Randomized Control Trials**

| S.No | Study Title | Author | Year | Design | Outcomes | Key Results |
|---|---|---|---|---|---|---|
| **1** | Development of a multidisciplinary medication management program in nursing homes | Hye Jun Lee | 2024 | Randomized controlled trial | Adverse drug events, falls, hospitalization | Long term follow up aimed |
| **2** | Improving care for elderly patients living with polypharmacy in Canada | M. Greiver | 2019 | Cluster randomized controlled trial | Reduction in potentially inappropriate prescriptions (PIPs) | Long term follow up will provide evidence that SPIDER intervention improves care for elders living with polypharmacy by reducing PIPs. |
| **3** | Impact of deprescribing intervention in hospitalized older adults in Malaysia | Chee Tao Chang | 2023 | Cluster-randomized controlled trial | Number of medications and PIMs | Follow up needed |
| **4** | Deprescribing in Frail Older People: A Randomized Controlled Trial | Kathleen Potter | 2016 | Randomized Controlled Trial | Number of medications | Reduction in the mean number of regular medicines in the intervention group. |
| **5** | GP-Led Deprescribing in Community-Living Older Australians: An Exploratory Controlled Trial | Kristen Anderson | 2019 | RCT | Hospitalization, Patient safety and quality of life | No significant difference in outcomes were reported in hospitalization and Quality of Life |
| **6** | Deprescribing Medications Among Older Adults From End of Hospitalization Through Postacute Care: A Shed-MEDS Randomized Clinical Trial | Eduard E Vasilevskis | 2023 | RCT | Clinical outcomes, medication burden | Reduction in medication burden was reported |
| **7** | Association of Deprescribing With Reduction in Mortality and Hospitalization: A Pragmatic Stepped-Wedge | Chong-hung Kua | 2020 | RCT | Hospitalization Rates and Mortality | Reduction in mortality and hospitalization |

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| | Cluster-Randomized Controlled Trial | | | | | |
| **8** | Effect of an In-Hospital Multifaceted Clinical Pharmacist Intervention on the Risk of Readmission: A Randomized Clinical Trial | Lene Vestergaard Ravn-Nielsen | 2018 | RCT | ER visits and hospital readmissions | Pharmacist led interventions result in reduction of hospitalization and ER visits |
| **9** | The MedSafer Study—Electronic Decision Support for Deprescribing in Hospitalized Older AdultsA Cluster Randomized Clinical Trial | Emily G. McDonald | 2022 | RCT | Reduction of ADEs within the first 30 days post discharge | proportion of patients with an adverse drug withdrawal event (ADWE). |
| **10** | Association of Deprescribing With Reduction in Mortality and Hospitalization: A Pragmatic Stepped-Wedge Cluster- | Chong-Han Kua | 2020 | RCT | Fall risk scores , mortality, number of hospitalized residents | Deprescribing was associated with reductions in mortality and number of hospitalized residents in nursing homes |

**Table 1.1**

**Systematic Reviews & Meta Analysis**

| S.No | Study Title | Author | Year | Design | Outcomes | Key Results |
|---|---|---|---|---|---|---|
| **1** | A systematic review of the evidence for deprescribing interventions among older people living with frailty | Kinda Ibrahim | 2021 | Systematic Review | Safety of deprescribing, clinical outcomes, medication-related outcomes | No significant changes in adverse events, hospitalization, or mortality rates. |
| **2** | Deprescribing for Community-Dwelling Older Adults: A Systematic Review and Meta-analysis | Hanna E. Bloomfield | 2020 | Systematic Review and Meta-analysis | All-cause mortality, hospitalizations, health-related quality of life, falls | Small reduction in mortality and medication burden |
| **3** | The feasibility and effect of deprescribing in older adults on mortality and health: a systematic review and meta-analysis | Amy T. Page | 2016 | Systematic Review and Meta-analysis | Mortality and health outcomes | Significant reduction in mortality |

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| **4** | Impact of deprescribing dual-purpose medications on patient-related outcomes for older adults near end-of-life: a systematic review and meta-analysis | Shakti Shrestha | 2021 | Systematic Review and Meta-analysis | Patient-related outcomes | Decreases mortality and hospitalization but no effect on other outcomes like quality of lif |
| **5** | The effect of deprescribing interventions on mortality and health outcomes in older people: An updated systematic review and meta-analysis | Hui Wen Quek | 2024 | Meta-Analysis | Mortality and health outcomes | Not available. |
| **6** | Outcomes of deprescribing interventions in older patients with life-limiting illness and limited life expectancy: A systematic review | Shakti Sharesta | 2019 | Systematic Review | Clinical outcomes | Improve medication appropriateness potential for enhancement of several clinical outcomes |
| **7** | Health Outcomes of Deprescribing Interventions Among Older Residents in Nursing Homes: A Systematic Review and Meta-analysis | CH Kua | 2019 | Systematic Review and Meta-analysis | Falls,mortality and hospitalization | medication review–directed deprescribing had significant benefits on older residents in nursing homes |
| **8** | Use of potentially inappropriate medications among ambulatory home-dwelling elderly patients with dementia: A review of the literature | Tejal Patel | 2019 | Systematic Review | cognitive level | Significant improvement in cognitive level |
| **9** | Deprescribing Interventions for Older Patients: A Systematic Review and Meta-Analysis | Dan Zhou | 2023 | Systematic review and meta analysis | Hospitalization rates,quality of life,ADRS,medication burden | Significantly improved clinical outcomes |

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| **10** | Does deprescribing improve quality of life? A systematic review of literature | Pruskowski JA, Springer S, Thorpe CT, Klein-Fedyshin M, Handler SM | 2019 | Systematic Review | Quality of Life (QOL), Satisfaction with Care (SWC), Emergency Department (ED) visits, Hospitalizations | No significant improvement in QOL or SWC; No significant change in ED visits or hospitalizations. |
| **11** | Measuring quality of life in deprescribing trials, a scoping review | Thompson W, Lundby C, Bleik A, et al. | 2024 | Scoping Review | Quality of Life (QOL) | Uncertainty regarding the effectiveness of existing scales to detect QOL changes due to deprescribing. |

**Table 1.2**

**Cohort Study**

| S.No | Study Title | Author | Year | Design | Outcomes | Key Results |
|---|---|---|---|---|---|---|
| 1 | Optimizing clinical outcomes in polypharmacy through poly-de-prescribing: a longitudinal study | Doron Garfinkel | 2024 | Longitudinal cohort | 3-year survival, hospitalizations, functional, mental, and cognitive status | PDP group showed improved satisfaction and cognitive status with more medications de-prescribed compared to non-responders. |
| 2 | Implementation of a compulsory clinical pharmacist-led medication deprescribing intervention in high-risk seniors in the emergency department | Joshua J. Jovevski | 2023 | retrospective, before-and-after intervention pilot study | compared case rates of deprescribing in the preintervention group to the postintervention group | No Change in hospitalization or mortality, Increase in post-ED primary care engagement. |
| 3 | A pilot cohort study of deprescribing for nursing home patients acutely admitted to hospital | Patrick Russell | 2019 | Prospective cohort study | Mortality and readmissions | Deprescribing medications during an unplanned hospital admission was not associated with mortality, readmissions, or overall health-related quality of life HRQOL |
| 4 | Prescribing and deprescribing in older people with life-limiting illnesses receiving hospice care | Tahani Alwidyan | 2023 | Retrospective longitudinal Cohort Study | Life limiting illnesses and end of life | Provides evidence of increased prevalence till end of life |

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| | at the end of life: A longitudinal, retrospective cohort study | | | | | |
| 5 | Prospective cohort study of nonspecific deprescribing in older medical inpatients being discharged to a nursing home | Patrick Russell | 2021 | Prospective, multicenter, cohort study | Readmissions and 1-year mortality rates, HRQOL | Deprescribing certain classes of medications during hospitalization was associated with worse mortality, but not readmissions or overall HRQOL |
| 6 | Multidisciplinary Team Deprescribing Intervention in Elderly Orthopedic Inpatients | Hiroyuki Seto | 2022 | single-center retrospective observational study | reduction in the mean number of regular medicines and PIMs, falls, delirium, unplanned hospital admissions within six months after discharge. | Reduction in the number of prescribed medicines and PIMs in elderly orthopedic inpatients, with some accompanying reduction in certain adverse events. |
| 7. | Is Polypharmacy Associated with Frailty in Older People? Results From the ESTHER Cohort Study | Kai-Uwe Saum | 2016 | Longitudinal, observational cohort study | incident frailty, Prevalent frailty | polypharmacy is associated with frailty, moderate exposure–response relationship between the number of medicines and prevalent as well as incident frailty. |