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Evaluating Medication Safety in the Elderly: Prevalence of Potentially Inappropriate Prescribing and Clinically Significant Drug-Drug Interactions.

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ABSTRACT

Background: The management of multiple chronic conditions in older adults may frequently yield complex therapeutic regimens, thereby rendering medication safety a paramount consideration of geriatric research. Polypharmacy, alongside potential drug-drug interactions (pDDIs), may serve as principal determinants of iatrogenic harm (1); however, comprehensive real-world data emanating from regional tertiary care settings frequently remains constrained. Consequently, the present investigation endeavors to delineate the prevalence and clinical severity of these aforementioned risks within a specified South Indian geriatric outpatient cohort.
Methods: A prospective, cross-sectional audit was conducted on 300 outpatients (aged 65 years or greater) at the Chamarajanagar Institute of Medical Sciences. Medication use was stratified into three tiers: non-polypharmacy (one to five pharmacological agents), polypharmacy (six to nine agents), and hyper-polypharmacy (ten or more agents). The Medscape Drug Interaction Checker was subsequently utilized for the identification and categorization of pDDIs' clinical significance, which was delineated as minor, moderate, or serious.
Results: The cohort exhibited a mean age of 69.82 ± 5.14 years, with a male predominance of 63.3%. Polypharmacy was identified in 20.0% of the population, while 2.3% were classified as having hyper-polypharmacy. Screening revealed that 112 patients (37.3%) were exposed to at least one potential Drug-Drug Interaction (pDDI), with a total of 300 interactions identified across the prescriptions. Moderate interactions accounted for the majority of findings (78.7%), while 3.3% were classified as serious, including high-risk combinations such as digoxin-amiodarone, and aspirin-enalapril. Logistic regression identified the total number of medications as the primary independent predictor of interaction risk.
Conclusion: The findings suggest that over one-third of geriatric outpatients may be exposed to clinically significant drug interactions; these interactions appear directly correlated with the cumulative medication count. These findings underscore the imperative for the implementation of systematic medication reviews and the integration of clinical decision-support tools to mitigate preventable pharmacological risks in older patient populations.

Keywords*: Polypharmacy, Geriatric, Drug-Drug Interactions, Medication Safety, Outpatient Care.*

INTRODUCTION

The rapid demographic shift toward an aging population has fundamentally altered the modern clinical landscape, thereby necessitating a re-evaluation concerning the management of chronic, multi-systemic diseases(2). Within the Indian context, this demographic transition is characterised by an escalating burden of multimorbidity, which almost inevitably necessitates polypharmacy(3),(4). While the concurrent administration of five or more medications often constitutes a clinical requirement for addressing overlapping conditions(5), its employment frequently engenders a precarious environment wherein the intended therapeutic benefits are overshadowed by the pervasive risk of iatrogenic harm, which encompasses increased frailty and mortality(6),(7).

The intrinsic peril associated with intricate therapeutic regimens resides in the substantial prevalence of potentially inappropriate prescribing and clinically significant drug-drug interactions (DDIs). Presently, global scholarly investigation designates medication safety within the geriatric demographic as a critical public health priority area, demonstrably associated with a cascade of adverse drug events and preventable hospital admissions (8),(9). The scale of this issue is particularly stark in acute care settings; investigations demonstrate that polypharmacy may impact nearly 95% of older inpatients, with over 60% of these individuals potentially receiving at least a single medication considered inappropriate for their age cohort (10). Furthermore, major DDIs remain a persistent threat even in community settings, often remaining undetected until a clinical complication occurs (11).

Within a regional tertiary care institution, namely the Chamarajanagar Institute of Medical Sciences (CIMS), these challenges are often compounded by a distinct constellation of socioeconomic determinants. The Department of General Medicine provides care for a diverse geriatric populace originating from rural and semi-urban South India, many of whom contend with advanced multimorbidity alongside diminished health literacy and restricted access to specialised care. While large-scale international trials, such as the OPERAM study, provide essential frameworks for understanding these risks (8), there appears to be a significant paucity of localized data that reflects the specific prescribing patterns and safety gaps unique to this regional demographic.

This investigation seeks to ameliorate this evidential lacuna through a rigorous evaluation of the prevalence, clinical characteristics, and risk factors pertaining to polypharmacy and clinically significant DDIs within the geriatric cohort at CIMS. By systematically identifying the most frequent prescribing errors and high-risk drug combinations, this endeavour aims to generate the localized, actionable evidence potentially requisite for the development of optimized prescribing protocols. Consequently, this investigation may serve as a foundational element for interventions designed to mitigate iatrogenic harm and to enhance the overall safety of medication management within this vulnerable patient demographic.

AIMS & OBJECTIVES

The principal objective of this investigation, which centers upon geriatric outpatients within a regional healthcare setting, entails an assessment of the safety and intricacy of pharmacotherapeutic regimens. The specific objectives are delineated as follows:

- The determination of the prevalence and clinical characteristics of polypharmacy and potentially inappropriate prescribing constitutes a primary objective, entailing the ascertainment of the incidence of conventional polypharmacy and hyper-polypharmacy among geriatric outpatients. Employing validated international criteria, such as the AGS Beers and STOPP/START tools, to detect deviations from medication safety guidelines and assess the aggregate therapeutic burden(12).
- The systematic identification and classification of the clinical significance of potential drug-drug interactions is undertaken, involving the detection and stratification of these pDDIs by severity utilizing established clinical decision-support systems(13,14). Emphasis is placed on delineating high-risk drug clusters and examining how multimorbidity complexity (prevalent in older adults) may exacerbate risks of adverse drug events and iatrogenic injury.

METHODS

To address the practical intricacies of geriatric prescribing within a regional tertiary care environment, a prospective, cross-sectional observational study design focusing on prescription utilization review was adopted. This study was carried out from 2013 to 2015 in partnership between the Department of Pharmacology and the Outpatient Department at the Chamarajanagar Institute of Medical Sciences. It assessed the prevalence of polypharmacy and potential drug-drug interactions. Observational approaches like this may facilitate the delineation of critical areas of medication safety concern among older adults—especially in outpatient and community contexts, where pDDIs frequently remain unobserved, as shown by a systematic review and meta-analysis highlighting their elevated rates in community-dwelling individuals (11). The aggregate therapeutic burden, as elucidated by bibliometric analyses on polypharmacy (9), frequently engenders preventable clinical hazards.

The study protocol received ethical approval from the Institutional Ethics Committee of CIMS. Throughout the investigation, participant autonomy and data confidentiality were rigorously upheld; consequently, written informed consent was secured from all participants prior to enrollment, and all clinical data were maintained in strict confidence. The examination of real-world prescribing practices within this South Indian cohort was undertaken to address the pressing

demand for region-specific evidence, particularly within an area where polypharmacy presents a pervasive challenge for geriatric patients (15)

Inclusion Criteria
Individuals, irrespective of sex and aged sixty-five years of age or older, who attended the Outpatient Department of the Chamarajanagar Institute of Medical Sciences were enrolled in the study. The age threshold of sixty-five years was chosen to conform with established international clinical standards and regulatory guidelines, including the International Council for Harmonisation E7 guideline (ICH-E7), which delineates individuals aged sixty-five years and older as the geriatric population (16). Inclusion of all qualifying outpatient attendees was intended to provide a representative view of prevalent medication safety vulnerabilities within routine geriatric care(17)

Exclusion Criteria
In alignment with the goal of comprehensively characterizing geriatric prescribing practices, the application of stringent clinical exclusion criteria was precluded. Arbitrary exclusions predicated on particular comorbidities or the volume of concurrent pharmacotherapy were deliberately omitted, as the examination of patients exhibiting complex multimorbidity could be crucial for the identification of clinically relevant drug-drug interactions and prescribing discrepancies(18,19) Exclusion from the final analysis was limited solely to participants who declined to provide written informed consent or whose prescription records proved inadequate for a comprehensive pharmacological assessment(20,21)

Data Collection and Recruitment
Recruitment of participants transpired on a pro rata basis from the outpatient department. To ensure ethical transparency, the study's nature and objectives were elucidated, in their primary language, to each participant, and written informed consent was subsequently obtained prior to any data retrieval. A two-method approach was employed for data collection, comprising reviewing clinical treatment records and conducting structured personal interviews using a pre-validated Case Record Form (CRF). The CRF was designed to capture a comprehensive clinical snapshot, including sociodemographic profiles, current symptomatic history, and detailed therapeutic regimens. This personal engagement with participants may prove essential in geriatric research for the accounting of "hidden" medication use or limited health literacy that might otherwise obscure the comprehensive clinical burden(22),(23).

Definitions of Polypharmacy
While no single universal definition of polypharmacy exists, a clinically stratified approach was adopted to more precisely delineate the escalating risk associated with increasing medication counts. Consistent with key areas of geriatric research—which suggest a sharp rise in inappropriate prescribing as drug counts increase—polypharmacy was categorized into three distinct tiers (15),(9):

- **Non-polypharmacy:** one to five concurrent medications.
- **Polypharmacy:** six to nine concurrent medications.
- **Hyper-polypharmacy:** ten or more concurrent medications.

This stratification allows for a more nuanced analysis of the cumulative treatment burden, particularly the transition into hyper-polypharmacy, which is increasingly recognized as a significant driver of adverse clinical outcomes and frailty in older adults (15,24).

Assessment of Potential Drug-Drug Interactions (pDDIs)
To evaluate the safety of the observed prescribing patterns, a systematic pharmacological audit was performed a systematic pharmacological audit of every prescription using the **Medscape Drug Interaction Checker**. This clinical decision-support tool was selected for its comprehensive database and its capacity for the categorization of potential interactions based on their clinical significance. Interactions were consequently classified into three distinct severity levels, thereby facilitating the prioritisation of clinical risk:

- **Minor:** Interactions possessing minimal significance, wherein clinical relevance remains improbable.
- **Moderate:** Clinically significant interactions, necessitating close monitoring or specific therapeutic adjustments.
- **Serious:** Interactions of high significance, where the associated risks characteristically outweigh the therapeutic benefits, thus necessitating the avoidance of the specific drug combination.

By focusing on these severity tiers, the study aimed to transcend a mere enumeration of interactions and thereby delineate the "serious" combinations that are most likely to lead to avoidable hospital admissions and iatrogenic harm in the geriatric population.

Statistical analysis
All collected data were underwent initial curation in Microsoft Excel and subsequently analyzed using Graph pad prism (Version 8.0) statistical software. To ensure the appropriate selection of descriptive metrics, the distribution of quantitative variables was evaluated through the Kolmogorov-Smirnov test. Consequently, the presentation of continuous variables occurs as mean ± standard deviation (SD); conversely, qualitative or categorical data receive description as absolute counts (N) and relative frequencies (%).

For subgroup comparisons, Fisher's exact test was utilized to identify significant differences across qualitative parameters. The construction of a binary logistic regression model facilitated the identification of independent predictors of medication safety risks. Subsequently, this analysis enabled the investigation into the association between the occurrence of potential Drug-Drug Interactions (pDDIs) and specific clinical risk factors, including age, gender, cumulative medication count, and the number of fixed-dose combinations prescribed, Such modeling may be deemed essential for isolating the primary drivers of iatrogenic risk in complex geriatric cohorts (24). The results of this regression are reported as adjusted odds ratios (aOR) with 95% confidence intervals. For all statistical tests, a two-tailed p-value of less than 0.05 was established as the threshold for clinical significance.

RESULTS

Patient Demographics and Age Distribution

A total of 300 geriatric outpatients were enrolled in the study. The cohort comprised a predominant proportion of male participants (n=one hundred ninety, 63.3%) and a substantial representation of female participants (n=one hundred ten, 36.7%). The mean age of the study population was 69.82 ± 5.14 years, with no significant difference observed between male (69.92 ± 5.13 years) and female (69.79 ± 3.88 years) participants. The predominant proportion of patients (n=247, 82.3%) was situated within the 65–74 age bracket, succeeded by the 75–84 demographic (n=46, 15.3%), with a smaller subset (n=7, 2.3%) representing individuals aged 85 years and above. This distribution highlights a significant concentration of the "young-old" population seeking outpatient care at this tertiary center (Tables 1 and 2).

Table 1: Age Distribution

Age Group (years)	Male (n = 190)	Female (n = 110)	Total (n = 300)
65–74	157 (82.6%)	90 (81.8%)	247 (82.3%)
75–84	28 (14.7%)	18 (16.4%)	46 (15.3%)
>85	5 (2.6%)	2 (1.8%)	7 (2.3%)
Mean Age (± Standard Deviation)	**69.92 ± 5.13**	**69.79 ± 3.88**	**69.82 ± 5.14**

Values are ex

Table 1: Demographic Characteristics by Gender

Gender	Number of Patients (n)	Mean Age (± SD)
Male	190 (63.33%)	69.92 ± 5.13
Female	110 (36.67%)	69.79 ± 3.88

Prescribing Patterns and the Burden of Polypharmacy

Analysis of the medication regimens suggests the presence of a substantial therapeutic burden among the outpatient population (**Table 3**). While 77.7% (n=233) of the patients were managed with five or fewer medicinal agents (non-polypharmacy), a significant proportion (22.3%) exhibited susceptibility to the inherent risks associated with polypharmacy. Specifically, polypharmacy (6–9 drugs) accounted for 20.0% (n=60) of cases, and hyper-polypharmacy (≥10 drugs) was identified in 2.3% (n=7). The prevalence of these higher polypharmacy categories may constitute a substantial concern, particularly as this appears increasingly correlated with heightened clinical complexity and an elevated potential for inappropriate prescribing in older adults(22).

Table 3: Polypharmacy and Hyperpolypharmacy

Polypharmacy Status	Male (n = 190)	Female (n = 110)	Total (n = 300)
Non-polypharmacy (1–5 drugs)	146 (76.84%)	87 (79.09%)	233 (77.67%)
Polypharmacy (6–9 drugs)	38 (20%)	22 (20%)	60 (20%)
Hyper-polypharmacy (≥10 drugs)	6 (3.16%)	1 (0.91%)	7 (2.33%)

Prevalence and Severity of Potential Drug-Drug Interactions (pDDIs)

Of the 300 patients, 112 (37.3%) exhibited the presence of at least one potential drug-drug interaction (pDDI) in their current prescription (**Table 4**). The frequency of such interactions per patient exhibited significant variability; specifically, 15% of the total cohort (n=45) appeared to manifest three or more simultaneous pDDIs.

The identification of 300 potential drug-drug interactions (pDDIs) was accomplished across the study population, categorized by clinical severity as shown in **Table 5**. The resultant distribution was delineated as follows:

- **Moderate interactions:** comprising 78.7% (n=236) of the total, these represent the most prevalent safety concern, often necessitating meticulous patient monitoring.
- **Mild interactions:** constituting 18.0% (n=54), these typically possess minimal anticipated clinical relevance.
- **Serious interactions:** accounting for 3.3% (n=10), these signify high-risk combinations that should generally be precluded from clinical practice.

The high proportion of moderate and serious potential Drug-Drug Interactions (pDDIs) appears consistent with observations in larger systematic reviews, wherein the intricate management of multimorbidity frequently culminates in a considerable iatrogenic risk(25).

Table 4: pDDI (Potential Drug–Drug Interactions) Frequency

Number of pDDIs	Male (n = 190)	Female (n = 110)	Total (n = 300)
No pDDI	116 (61.1%)	72 (65.5%)	188 (62.7%)
1–2 pDDIs	46 (24.2%)	31 (28.2%)	77 (25.7%)
3–5 pDDIs	24 (12.6%)	14 (12.7%)	38 (12.7%)
≥6 pDDIs	4 (2.1%)	3 (2.7%)	7 (2.3%)

Table 5. Potential Drug-Drug Interaction (pDDI) Severity

Potential Drug-Drug Interaction (pDDI) Severity	Male (n = 190)	Female (n = 110)	Total (n = 300)
Mild/Minor pDDI	34 (17.9%)	20 (18.2%)	54 (18.0%)
Moderate pDDI	146 (76.8%)	90 (81.8%)	236 (78.7%)
Serious pDDI	10 (5.3%)	0 (0%)	10 (3.3%)

Categorical Analysis of Serious Drug Combinations

A targeted audit of serious potential Drug-Drug Interactions (pDDIs) elucidated specific therapeutic clusters which may pose a direct threat to patient safety (**Table 6**). The most frequently manifesting serious interactions pertained to cardiovascular and antiplatelet agents. Exemplars of particular note included the **Aspirin + Enalapril** and **Digoxin + Amiodarone** pairs (each observed on three occasions), which may precipitate compromised renal function and lethal electrolyte imbalances, respectively. Other high-risk combinations included **Omeprazole + Clopidogrel** (n=2) and **Warfarin + Clopidogrel** (n=2). These findings may suggest the imperative for enhanced prescribing protocols in geriatric clinics with a substantial cardiology caseload(26).

Table 6: Drug Pairs Involved in Serious Potential Drug-Drug Interaction (pDDI)

Drug Pair	Number of pDDIs	Effect of Interaction
Aspirin + Enalapril	three	Diminished renal function and attenuated antihypertensive effects of enalapril may transpire(27),(28)
Diclofenac + Enalapril	one	The potential for diminished renal function and a reduction in enalapril's antihypertensive effects may arise(29),(28)
Omeprazole + Clopidogrel	two	A reduction in the antiplatelet efficacy of clopidogrel may eventuate(30,31)
Aspirin + Ramipril	one	A diminution of renal function and an attenuation of ramipril's antihypertensive effects could transpire(28)
Ibuprofen + Enalapril	one	The potential for a decrement in renal function and an attenuation of enalapril's antihypertensive effects may manifest(32),(28)
Aspirin + Ibuprofen	two	An exacerbation of toxicity and a diminution of aspirin's therapeutic effects may be observed(33),(34)
Warfarin + Clopidogrel	two	Could heighten bleeding risk, consequent upon an enhanced anticoagulant effect of warfarin(35,36)
Simvastatin + Clarithromycin	one	The potential for rhabdomyolysis may arise from elevated simvastatin levels(37,38)
Metformin + Furosemide	one	An augmented risk of hypoglycemia may manifest, attributable to an enhanced effect of metformin(39,40)
Digoxin + Amiodarone	three	Elevated digoxin levels could precipitate toxicity, such as arrhythmias(41,42)
Amlodipine + Simvastatin	one	A heightened risk of myopathy may occur, owing to elevated simvastatin levels(43,44)

"Clinically significant" interactions constitute instances in which clinical risks typically outweigh therapeutic benefits(45).

Predictors of Medication-Related Risk

For the isolation of the principal determinants of potential drug-drug interactions (pDDIs), a binary logistic regression model was utilized (**Table 7**). After adjusting for age and gender, the analysis appears to identify the total number of medications as a potent independent predictor for the occurrence of pDDIs. This observation serves to reinforce the established clinical consensus, suggesting that as the prescription count transcends the threshold of five medications, an elevation in the likelihood of a clinically significant interaction frequently manifests(11,46).

Table 7: Logistic Regression Analysis for Predictors of pDDI

Variable	Potential Drug-Drug Interactions (pDDI)	No Potential Drug-Drug Interactions	Wald Odds Ratio (95% CI)	P-value
Age				
≤70	78	129	0.73 (0.46–1.15)	0.17
>70	22	33		
Gender				

Male	62	128	1.08 (0.74–1.56)	0.71
Female	38	31		
Number of Drugs				<0.0001
≥6	72	118	16.64 (11.10–25.18)	<0.0001
1–5	28	41		
Number of Fixed-Dose Combinations				0.4080
≤1	80	143	0.66 (0.37–1.19)	0.4080
>1	3	3		

Adjusted Odds Ratio (aOR); Confidence Interval (CI); $P < 0.05$ denotes statistical significance.

DISCUSSION

The present investigation delineates a substantial pharmacological burden and an elevation in iatrogenic risks within a regional geriatric outpatient setting, wherein the prevalence of polypharmacy encompassed 20.0% of patients, hyper-polypharmacy affected 2.3% of individuals, and potential drug-drug interactions (pDDIs) manifested in 37.3% of the cohort, with 15 percent concurrently experiencing three or more such interactions. These findings, including the total number of medications as the putative strongest independent predictor of pDDIs (aOR 16.64, $P < 0.0001$), appear to align with global trends and systematic reviews that identify medication safety in older adults as an urgent clinical priority (9), (15)

The documented prevalence of polypharmacy (22.3% for ≥ six pharmaceutical agents) and hyper-polypharmacy (2.3% for ≥ ten pharmaceutical agents) within this geriatric cohort thus underscores the inherent complexities associated with the management of multimorbidity in an aging demographic. Although the majority of patients were situated within the non-polypharmacy cohort, the requisite intensive pharmacological management for a significant subset potentially augments iatrogenic risks. Recent bibliometric analyses demonstrate that escalating treatment burdens substantially amplify the risk of 'prescribing cascades'—a phenomenon wherein adverse effects are misconstrued as new symptoms—thereby posing a dominant threat to patient safety (15), (9); consequently, our binary logistic regression analysis appears to confirm the total number of prescribed drugs as the putative strongest independent predictor of pDDIs (aOR 16.64, $P < 0.0001$). This observation reinforces the clinical consensus that interaction risks could escalate exponentially beyond the five-drug threshold (24),(11),(8).

This study's pivotal finding is the observation that 37.3% of the geriatric cohort evinced exposure to at least one potential drug-drug interaction (pDDI), a prevalence that demonstrates considerable congruence with meta-analytic estimates from community-dwelling older adults (11). Although a significant portion of identified pDDIs were classified as "moderate" (78.7% or 236/300; Table 5), their clinical implications merit judicious appraisal. The management of these moderate interactions frequently necessitates proactive clinical monitoring, judicious dose adjustments, or targeted deprescribing interventions, primarily to avert insidious adverse outcomes—such as electrolyte imbalances, diminished therapeutic efficacy, or escalation to severe events—that demonstrably contribute to the iatrogenic burden associated with polypharmacy (11),(47),(8),(48)

Of greater concern is the identification of "Serious" interactions, constituting 3.3% of the total identified pDDIs. Such high-risk combinations include Aspirin + Enalapril (three instances), Digoxin + Amiodarone (three instances), and Warfarin + Clopidogrel (two instances); These combinations present direct threats to renal, cardiac, and hemostatic stability, respectively, due to mechanisms such as diminished renal function, exacerbated antihypertensive effects, increased digoxin levels leading to toxicity, and augmented bleeding risk from enhanced anticoagulant effects (8). The presence of the Warfarin + Clopidogrel pair is particularly notable, as meta-analyses of community-dwelling older adults consistently elucidate anticoagulant-related interactions as a principal determinant of preventable hospital admissions (49),(11). Other high-risk pairs, including Omeprazole + Clopidogrel (two instances), which may lead to diminished antiplatelet effect of clopidogrel,, further underscore these dangers (31). The use of clinical decision-support tools, such as the Medscape checker employed here, could prove integral to the identification of these latent risks, which might otherwise be overlooked within demanding outpatient environments(11,13).

The present findings suggest the imperative necessity of a paradigm shift from an age-agnostic prescribing approach toward a geriatric-centered model, particularly given the exponential rise in potential drug-drug interaction (pDDI) risks beyond five medications observed here (aOR 16.64, $P < 0.0001$). Although fixed-dose combinations were not a significant predictor (Table 7, $P = 0.408$), their reliance alongside multimorbidity management in this cohort—where 37.3% experienced pDDIs—may necessitate routine, comprehensive medication reviews, thereby potentially averting prescribing cascades.(50) Implementing validated safety criteria, such as STOPP/START or Beers criteria, appears efficacious in identifying and de-prescribing potentially inappropriate medications, thereby mitigating clinical harm before it occurs.(51),(52) Furthermore, our findings align with evidence that pharmacist-led interventions and automated screening tools (e.g., Medscape) may substantially reduce serious pDDIs—prevalent at 3.3% here—in regional settings, as demonstrated in community-dwelling elders

Strengths and Limitations

The principal advantages of this investigation encompass its **prospective design**, which minimizes recall bias inherent in retrospective analyses, and its **evaluation of real-world phenomena** of prescribing patterns in a specific regional geriatric outpatient context. This approach may yield **essential localized data**, potentially addressing a critical gap, as existing studies often focus on specific populations with limited sample sizes, making it difficult to understand variations across different populations.(25) Moreover, employing a validated clinical decision-support tool may augment the reliability of potential drug-drug interaction (pDDI) detection, aligning with recommendations for routine screening in high-risk geriatric populations(11,53).(8,24); however, the acknowledgement of certain limitations is imperative. As a **cross-sectional study**, it identifies potential rather than clinically confirmed adverse drug events, though this still establishes a vital prevalence baseline consistent with meta-analytic estimates(11). Additionally, excluding over-the-counter medications and herbal supplements—common in similar studies—likely **underestimates** the true pharmacological burden, underscoring the need for comprehensive patient histories in future research(13)

CONCLUSION

In conclusion, this study may indicate that a substantial proportion of geriatric outpatients are exposed to at least one potential drug-drug interaction (pDDI), with the robust independent predictability of which is underscored by the prevalence of polypharmacy. While most pDDIs were of moderate severity, life-threatening or contraindicated drug-drug interactions, including combinations such as aspirin-warfarin, may pose a considerable threat to patient safety, aligning with meta-analytic estimates of thirty to fifty percent prevalence of potentially inappropriate prescribing involving anticoagulants, and the risk of anticoagulant-driven hospitalizations. For the amelioration of prescribing cascades and iatrogenic harm, a recalibration of geriatric care toward an age-tailored paradigm appears imperative incorporating routine medication reviews via validated instruments, encompassing: STOPP/START, Beers criteria, and decision-support systems such as Medscape. Pharmacist-led interventions appear to consistently demonstrate efficacy in the mitigation of such risk. Future longitudinal research may prove essential for the quantification of the direct impacts of pDDIs upon hospitalization rates and the quality of life of affected individuals.

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