

Prevalence of Potentially Inappropriate Medication Use and Polypharmacy Among Older Adults Presenting to the Emergency Department

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Abstract

Objective: To determine the prevalence of polypharmacy and potentially inappropriate medication use (IMU) among older adults presenting to the emergency department (ED), identify demographic and clinical factors associated with IMU, and compare the performance of three validated screening tools in this setting.

Materials and Methods: This prospective, single-center observational study was conducted in the ED of a tertiary training and research hospital over a three-month period beginning on March 1, 2022. Consecutive patients aged 65 years and older who were triaged as green or yellow, used at least one systemic medication, and had a complete, verifiable medication history were enrolled. Each medication list was independently screened using the 2019 American Geriatrics Society Beers Criteria, the STOPP version 2 criteria, and the Turkish TIME-to-STOP/TIME-to-START criteria. Agreement between the tools was quantified using Cohen's kappa. Associations with IMU and hospitalization were examined using the chi-square or Fisher's exact test, the independent-samples t-test or Mann-Whitney U test, and multivariable logistic regression.

Results: A total of 203 patients were included (mean age, 76.5±7.4 years). Polypharmacy, defined as the use of five or more medications, was present in 94.1% of patients, with a mean of seven medications per patient. At least one potentially inappropriate medication was identified in 100 patients (49.3%) by at least one tool. The STOPP criteria identified the highest proportion (69/203, 34.0%), followed by the Beers Criteria (54/203, 26.6%) and the TIME criteria (31/203, 15.3%); only one patient (0.5%) was identified by all three tools. Agreement was low to moderate between Beers and STOPP ($\kappa=0.316$) and poor between Beers and TIME ($\kappa=-0.182$) and between STOPP and TIME ($\kappa=-0.039$). Proton pump inhibitors, antipsychotics, and non-steroidal anti-inflammatory drugs were the medication classes most frequently flagged. Coronary artery disease was associated with IMU in the unadjusted analysis ($p=0.03$). The frequency of IMU did not differ between hospitalized and discharged patients (53.5% versus 58.0%; $p=0.544$), and IMU positivity by any tool was not independently associated with hospitalization after multivariable adjustment.

Conclusion: Polypharmacy and potentially inappropriate medication use are highly prevalent among older adults presenting to the ED, but the three screening tools identified substantially different patient groups. The tools should be regarded as complementary rather than interchangeable, and structured medication review remains necessary alongside any single instrument.

Keywords: Aged, Deprescribing, Emergency service, Hospital, Inappropriate prescribing, Polypharmacy, Potentially inappropriate medication list

Introduction

The global population is aging rapidly, including in Türkiye. As of 1 July 2025, the population aged 65 years and older in Türkiye reached approximately 9,583,059 individuals, corresponding to 11.1% of the total population according to estimates and demographic data from the Turkish Statistical Institute. Population projections

produced by TurkStat indicate that, if current demographic trends persist, the share of the population aged 65 years and older is expected to rise further in the coming decades. Specifically, projections suggest that this share will reach approximately 13.5% by 2030, 17.9% by 2040, 27.0% by 2060, and 33.4% by 2080 [1]. These projected increases reflect the ongoing process



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of population aging in Türkiye and have important implications for social policy, economic planning, and healthcare systems. This demographic transition increases healthcare utilization and leads to a growing number of geriatric presentations to emergency departments (EDs).

A key feature of the geriatric population is multimorbidity, which often necessitates the concurrent use of multiple medications [2]. Polypharmacy, commonly defined as the use of five or more medications, has been associated with adverse drug reactions, drug–drug interactions, falls, cognitive impairment, and poor adherence [3,4]. Studies indicate that, in developed countries, approximately 30% of adults aged 65 years and older use at least five medications [5]. Age-related pharmacokinetic and pharmacodynamic changes further increase vulnerability to drug-related problems, contributing to higher rates of hospitalization and mortality [6].

To mitigate these risks, several evidence-based tools have been developed to identify potentially inappropriate medication use in older adults. The most widely used tools include the American Geriatrics Society Beers Criteria and the European STOPP/START criteria [7]. In Türkiye, the TIME (Turkish Inappropriate Medication Use in the Elderly) criteria provide population-specific guidance for optimizing prescribing in older adults [8]. These instruments support clinicians in designing safer and more rational pharmacotherapy regimens.

The concurrent application of three potentially inappropriate medication use (IMU) screening tools enables a more comprehensive assessment of inappropriate prescribing among older adults in emergency department settings. Given the rising number of older adults presenting to the emergency department and their increasing clinical complexity, this strategy may help optimize medication use and enhance patient safety by facilitating the identification of individuals at risk for adverse drug events.

This study aimed to determine the prevalence of polypharmacy and IMU among geriatric ED patients, examine demographic and clinical factors associated with IMU, and assess the frequency of potential drug–drug and drug–disease interactions in this population.

Materials and Methods

Study Design and Setting

This prospective observational study was conducted in the Emergency Department of Erzurum Training and Research Hospital. The study was initiated following approval from the Erzurum Regional Training and Research Hospital Ethics

Committee, with decision number KAEK 2020/07-76 and reference number 37732058-514.10. Patient recruitment started on 1 March 2022 and included all eligible older adults who presented during a three-month period. All procedures were integrated into routine clinical care, and no additional interventions were performed. The primary objective was to determine the prevalence of polypharmacy and potentially inappropriate medication use (IMU) among older adults presenting to the emergency department and to identify demographic and clinical factors associated with inappropriate medication use.

The study was conducted in a tertiary emergency department with approximately 1,500–2,000 patient visits per day. Only patients aged ≥ 65 years who fulfilled all eligibility criteria and had a complete, verifiable medication history were included to ensure reliable assessment using the three IMU screening tools, resulting in a limited number of eligible participants.

Study Population

The study population comprised patients aged 65 years and older who presented to the Emergency Department of Erzurum Training and Research Hospital during the study period. The study sample included patients triaged as green or yellow according to the emergency triage system who provided informed consent to participate. Patients with life-threatening conditions (red triage), those requiring intensive care, and individuals unable to provide informed consent were excluded. All eligible patients meeting the inclusion criteria were consecutively enrolled.

Inclusion Criteria

Participants were eligible if they met all of the following criteria:

- Age ≥ 65 years
- Presentation to the Emergency Department during the study period
- Triage category classified as green or yellow
- Use of at least one systemic medication
- Ability to provide informed consent directly or via a legally authorized caregiver

Exclusion Criteria

Patients were excluded if they met any of the following criteria:

- Red triage (life-threatening condition requiring immediate resuscitation)
- Requirement for intensive care unit admission at presentation
- Terminal-stage malignancy under end-of-life care
- Severe cognitive impairment without reliable caregiver

support

- Incomplete or unverifiable medication records
- Repeated ED visits during the study period (only the first visit was included)

Data Collection

Data were collected using a structured data collection form developed by the researchers based on the relevant literature. Information was obtained through face-to-face interviews with patients or their caregivers and by reviewing electronic medical records. The data collection form included demographic characteristics, presenting complaints, comorbid conditions, and complete medication histories, including prescription drugs, over-the-counter medications, and herbal products.

Assessment of Potentially Inappropriate Medication Use

Each patient was independently evaluated using three validated screening tools:

- 2019 American Geriatrics Society Beers Criteria
- STOPP version 2 criteria
- Turkish TIME-to-STOP/TIME-to-START criteria

Overlapping potentially inappropriate medications identified by more than one tool were recorded separately for analytical comparison.

Statistical Analysis

Statistical analyses were performed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). The distribution of continuous variables was assessed using the Shapiro–Wilk test. Normally distributed variables are presented as mean±standard deviation (SD), whereas non-normally distributed variables are expressed as median (interquartile range [IQR]). Categorical variables are presented as frequencies and percentages. Comparisons between groups were performed using the independent-samples t-test or the Mann–Whitney U test for continuous variables, as appropriate according to the data distribution, and the chi-square test or Fisher’s exact test for categorical variables. Factors associated with potentially inappropriate medication use were evaluated by calculating odds ratios (ORs) with 95% confidence intervals (CIs). A two-sided *p* value <0.05 was considered statistically significant.

Agreement between the three screening tools was quantified using Cohen’s kappa coefficient for each pairwise comparison. Factors associated with hospitalization were examined using multivariable logistic regression; complete-case analysis was used, and the number of observations included in each model is reported with the corresponding results.

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of Erzurum Training and Research Hospital prior to the initiation of the study. Written informed consent was obtained from all participants or their legally authorized representatives.

Results

A total of 203 patients were included in the study. The mean age was 76.5±7.4 years. There was no statistically significant difference in mean age between patients with IMU and those receiving appropriate medications (*p*>0.05). Similarly, sex distribution did not differ significantly between the groups.

The most common presenting complaint among geriatric patients was dyspnea, observed in 35 patients (17.2%), representing the leading reason for emergency department admission. Gastrointestinal complaints, particularly abdominal pain, were reported in 11 patients (5.4%). Similarly, deterioration in general condition was identified in 11 patients (5.4%), reflecting the nonspecific but clinically significant presentations frequently encountered in older adults.

Cardiovascular-related symptoms were also prominent. Chest pain was documented in 5 patients (2.5%), while combinations of chest pain and dyspnea were observed in several additional cases. Neurological complaints, including headache and dizziness, were each reported in 4 patients (2.0%).

When categorized by system involvement, respiratory complaints constituted the largest proportion of admissions, followed by gastrointestinal and cardiovascular symptoms. These findings indicate a predominance of cardiopulmonary and systemic presentations in the geriatric emergency population.

Polypharmacy, defined as the use of ≥5 medications, was present in 94.1% of patients. In our cohort, patients used a mean of 7 medications; this reflects a significant medication burden in the older population in Türkiye [9]. Overall, 49.3% of the study population had at least one potentially inappropriate medication according to the Beers, STOPP, or TIME criteria [7,8]. The proportion of patients at risk of clinically significant drug–drug interactions was 2.46%.

The most common classes of potentially inappropriate medications were proton pump inhibitors (PPIs), antipsychotics, and nonsteroidal anti-inflammatory drugs (NSAIDs). Examples of condition-specific problematic medications included:

- Pantoprazole: risk in osteoporosis and chronic kidney disease
- Etodolac: gastrointestinal bleeding and impaired renal function
- Quetiapine and olanzapine: increased risk in dementia and falls and increased cardiovascular risk
- Donepezil: bradycardia and syncope
- Metformin: contraindicated in severe renal impairment (eGFR<30 mL/min/1.73 m²)
- Diltiazem: not recommended in NYHA class III–IV heart failure
- Insulin: risk of hypoglycemia in frail older adults

Drugs identified as potentially inappropriate by all three screening tools included proton pump inhibitors when used long-term, antipsychotics in patients with dementia, benzodiazepines, and chronic NSAID therapy in high-risk patients.

Hypertension, diabetes mellitus, and coronary artery disease were the most prevalent chronic conditions. Table 1 presents the distribution of chronic diseases according to IMU status, along with the statistical associations between each chronic disease and IMU.

Drug–disease interaction risk was identified in 11 patients (5.4%), reflecting known contraindications between specific medications and underlying chronic conditions.

Chi-square analysis demonstrated a statistically significant association between coronary artery disease and IMU ($p=0.03$). Patients with coronary artery disease had higher odds of receiving

potentially inappropriate medications than those without coronary artery disease. No statistically significant associations were observed for hypertension, diabetes mellitus, chronic obstructive pulmonary disease, heart failure, stroke, chronic kidney disease, atrial fibrillation, hyperlipidemia, or Alzheimer's disease (Table 1).

Key laboratory parameters and demographic characteristics of patients with and without IMU are summarized in Table 2. No significant differences were found between the groups regarding age, hemoglobin, renal function markers, liver enzymes, or coagulation parameters ($p>0.05$ for all comparisons).

Among the total study population ($n=203$), 56.2% required hospitalization, 43.3% were discharged from the emergency department, and 0.5% died during follow-up. When patients discharged from the ED were compared with those requiring hospitalization, several clinical and laboratory parameters differed significantly. Hospitalized patients had higher blood urea nitrogen and creatinine levels, indicating more advanced renal impairment ($p<0.05$). D-dimer levels were also significantly higher among hospitalized patients ($p<0.05$), consistent with a greater thromboembolic or inflammatory burden (Table 3).

Presenting complaints differed between the groups: patients admitted to inpatient wards more frequently presented with deterioration in general condition, respiratory distress, and infectious symptoms. Age did not differ significantly between discharged and hospitalized patients ($p>0.05$).

Regarding the comparative performance of the IMU screening tools, the STOPP criteria identified the highest proportion of patients with potentially inappropriate medication use (69/203, 34.0%), followed by the Beers criteria (54/203, 26.6%) and the TIME criteria (31/203, 15.3%). Only one patient (0.5%) was identified by all three tools. Pairwise agreement was low to moderate between Beers and STOPP ($\kappa=0.316$) and poor between Beers and TIME ($\kappa=-0.182$) and between STOPP and TIME ($\kappa=-0.039$), indicating substantial variability in patient identification across the screening tools (Table 4).

The frequency of potentially inappropriate medication use did not differ significantly between hospitalized and discharged patients (53/99, 53.5% versus 51/88, 58.0%; $p=0.544$) (Table 3), and IMU was not independently associated with hospitalization after multivariable adjustment. Hospitalized patients more frequently presented with systemic complaints, elevated markers of infection and inflammation, impaired renal function, and abnormal vital signs, although not all differences reached statistical significance.

Table 1. Association between chronic diseases and potentially inappropriate medication use

Chronic disease	IMU (n)	No-IMU group (n)	p
Hypertension (HT)	70	84	0.48
Diabetes mellitus (DM)	45	57	0.84
Coronary artery disease	65	38	0.03
COPD	29	34	0.67
Heart failure	18	40	0.08
Stroke	6	13	0.45
Chronic kidney disease	6	12	0.56
Atrial fibrillation	4	11	0.31
Hyperlipidemia	4	10	0.42
Alzheimer's disease	5	8	0.98

Values are presented as number of patients (n). Comparisons between groups were performed using the chi-square test or Fisher's exact test, as appropriate. Bold indicates a statistically significant difference ($p<0.05$). IMU: inappropriate medication use, HT: hypertension, DM: diabetes mellitus, COPD: chronic obstructive pulmonary disease.

Table 2. Key laboratory data and demographics by IMU status

Variable	IMU, mean±SD	No-IMU group, mean±SD	p
Age (years)	76.79±7.74	76.23±7.05	0.700
HGB (g/dL)	13.27±2.70	13.76±1.75	0.251
HCT (%)	41.90±8.52	42.87±5.84	0.418
MCV (fL)	85.94±6.99	87.93±5.85	0.161
PLT (×10 ⁹ /L)	247.99±84.77	249.79±87.93	0.701
NEUT (%)	64.77±26.60	72.33±15.68	0.401
LYMPH (%)	15.26±12.15	16.49±10.91	0.466
BUN (mg/dL)	37.04±24.87	36.36±29.29	0.433
Creatinine (mg/dL)	1.34±0.81	1.30±0.77	0.635
GFR (mL/min/1.73 m ²)	61.94±28.12	63.59±32.75	0.874
Sodium (mmol/L)	138.67±6.62	138.20±4.09	0.944
Potassium (mmol/L)	4.46±0.66	4.34±0.72	0.605
Calcium (mg/dL)	9.02±0.81	8.78±0.89	0.216
Magnesium (mg/dL)	1.88±0.34	1.79±0.45	0.390
CK (U/L)	95.11±91.29	116.16±154.03	0.747
Direct bilirubin (mg/dL)	0.36±0.39	0.40±0.36	0.458
Total bilirubin (mg/dL)	0.87±0.61	1.10±0.87	0.114
ALT (U/L)	28.02±35.60	31.71±56.51	0.231
AST (U/L)	38.86±39.73	43.01±85.66	0.704
Albumin (g/L)	40.10±4.86	39.20±6.17	0.330
Chloride (mmol/L)	105.77±6.58	103.18±15.67	0.763
APTT (s)	32.40±10.54	29.95±6.15	0.440
INR	1.67±1.68	1.36±0.60	0.491
Fibrinogen (mg/dL)	461.65±154.08	435.12±158.44	0.920
PT (s)	21.14±19.58	18.14±7.80	0.607

Values are presented as mean ± standard deviation (SD) and were compared using the independent-samples t-test or the Mann-Whitney U test, as appropriate. No comparison reached statistical significance ($p > 0.05$ for all). IMU: inappropriate medication use, HGB: hemoglobin, HCT: hematocrit; MCV: mean corpuscular volume, PLT: platelet count, NEUT: neutrophils, LYMPH: lymphocytes, BUN: blood urea nitrogen, GFR: glomerular filtration rate, CK: creatine kinase, ALT: alanine aminotransferase, AST: aspartate aminotransferase, APTT: activated partial thromboplastin time, INR: international normalized ratio, PT: prothrombin time, SD: standard deviation.

In a multivariable logistic regression model adjusted for age, sex, medication count, vital signs, comorbidities, and IMU positivity according to each tool ($n=144$), IMU positivity according to the Beers, STOPP, or TIME criteria was not independently associated with hospitalization. In a secondary complete-case model including laboratory variables ($n=62$), higher BUN levels were independently associated with hospitalization (aOR 1.067 per mg/dL, 95% CI 1.007–1.130; $p=0.028$).

Discussion

This study demonstrates that polypharmacy and potentially inappropriate medication use are highly prevalent among geriatric ED patients. The observed polypharmacy rate of 94.1% is higher than that reported in many previous studies. We believe that this finding may be attributable to the advanced age and high burden of multimorbidity in the study population, the use of a polypharmacy definition based on five or more medications, and the inclusion of medications intended for short-term use when they were being used at the time of assessment [2,5].

Across the three screening tools, proton pump inhibitors, antipsychotics, and nonsteroidal anti-inflammatory drugs were the medication classes most frequently identified as potentially inappropriate. Their recurrent identification reflects clinically relevant concerns in older adults, including prolonged treatment without a clear indication, increased risks of falls and cognitive adverse effects, gastrointestinal bleeding, and impaired renal function. These findings emphasize the importance of interpreting IMU classifications in relation to treatment duration, comorbidities, and individual clinical risk rather than considering screening results in isolation.

In our study, nearly half of the participants (49.3%) were exposed to at least one potentially inappropriate medication. Similar findings have been reported in previous studies. Wong et al. [10] demonstrated that approximately 65% of older patients with frequent emergency department visits were prescribed at least one potentially inappropriate medication. Likewise, studies conducted in Türkiye have revealed a high prevalence of inappropriate medication use among older adults [11,12].

Among geriatric patients presenting to the emergency department, polypharmacy has been reported in up to 55.6% of cases, and at least one potentially inappropriate medication has been identified in 63.0% of patients. In our cohort, the mean number of medications used was 7. In comparison, Wong et al. [10] reported a higher medication burden, with a mean of 9 regularly prescribed medications. Recent international studies further support these findings and highlight the impact of potentially inappropriate medication use on emergency department utilization and admission outcomes [13,14].

An important finding of this study is the significant association between coronary artery disease and IMU. Patients with coronary artery disease typically receive complex pharmacological regimens, including antiplatelet agents, beta-blockers, statins, and renin-angiotensin system blockers, often in combination with drugs prescribed for other comorbidities [15]. This complexity increases

Table 3. Comparison of clinical and laboratory characteristics between hospitalized and discharged patients

Variable	Hospitalized (n=99)	Discharged (n=88)	p
Age, years	76.00 (71.50–82.00)	75.00 (70.50–80.00)	0.256
Male sex	51 (51.5)	35 (39.8)	0.108
Any IMU	53 (53.5)	51 (58.0)	0.544
General deterioration/weakness	20 (20.2)	5 (5.7)	0.004
Respiratory complaint	33 (33.3)	43 (48.9)	0.031
Infectious symptom	8 (8.1)	6 (6.8)	0.743
Heart rate, beats/min	91.00 (84.00–104.00)	92.50 (77.75–105.25)	0.609
Respiratory rate, breaths/min	24.00 (20.00–27.00)	23.00 (20.00–25.00)	0.096
Oxygen saturation, %	90.00 (83.25–93.00)	91.00 (85.00–94.00)	0.294
Temperature, °C	36.40 (36.20–36.60)	36.40 (36.00–36.55)	0.104
WBC ($\times 10^9/L$)	9.44 (7.88–12.59)	8.62 (6.92–10.63)	0.142
BUN (mg/dL)	36.00 (23.00–57.00)	23.50 (18.00–34.00)	<0.001
Creatinine (mg/dL)	1.23 (0.82–1.73)	1.04 (0.84–1.39)	0.211
D-dimer (ng/mL)	1614.50 (1076.25–2873.00)	1040.00 (609.00–2744.00)	0.013
Lactate (mmol/L)	2.15 (1.48–3.00)	2.10 (1.80–2.80)	0.644

Values are presented as n (%) or median (interquartile range), as appropriate. Normality was assessed using the Shapiro–Wilk test. Continuous variables were compared using Welch's independent-samples t-test or the Mann–Whitney U test; categorical variables were compared using Pearson's chi-square or Fisher's exact test, as appropriate. Bold indicates a statistically significant difference ($p < 0.05$). Outcome analysis included 99 documented hospitalizations and 88 documented discharges. One death and 15 records with missing or uncertain disposition were excluded. Presenting-complaint categories were derived from prespecified keyword coding and were not mutually exclusive. IMU: Inappropriate medication use, WBC: white blood cell count, BUN: blood urea nitrogen, IQR: interquartile range.

Table 4. Prevalence of potentially inappropriate medication use according to each screening tool (n=203)

Screening tool	n	%
Beers criteria	54	26.6
STOPP criteria	69	34.0
TIME criteria	31	15.3
Identified by all three tools	1	0.5
≥ 1 IMU by any tool	100	49.3

Percentages are calculated over the total study population (n=203). Categories are not mutually exclusive. IMU: Inappropriate medication use.

the risk of drug–drug interactions, therapeutic duplication, and deviation from guideline-recommended therapy [16]. Regular medication reconciliation and periodic comprehensive medication review are therefore particularly important in older patients with cardiovascular disease [17].

The association between coronary artery disease and IMU observed in the unadjusted analysis suggests that patients with cardiovascular multimorbidity may be particularly vulnerable to inappropriate prescribing; however, this relationship was not evaluated in a multivariable model due to statistical limitations.

Neither the presence of potentially inappropriate medication use (OR 0.91, 95% CI 0.50–1.66; $p=0.76$) nor increasing IMU burden per unit increase (OR 1.03, 95% CI 0.89–1.19; $p=0.68$) was significantly associated with hospitalization.

STOPP identified the largest proportion of patients with potentially inappropriate medication use, whereas TIME identified the smallest proportion. However, the higher detection rate of STOPP should not be interpreted as evidence of superior accuracy because no independent gold standard was available. The limited agreement among the three tools suggests that they capture different aspects of inappropriate prescribing. Differences in medication lists, clinical conditions, health system context, and the populations for which the criteria were developed may contribute to this variability. Accordingly, the tools may be more appropriately considered complementary rather than interchangeable.

Unlike previous Turkish studies conducted primarily in outpatient or community settings, this study evaluates potentially inappropriate medication use in an emergency department population using three validated screening tools simultaneously. The findings demonstrate a significant association between coronary artery disease and IMU, highlighting cardiovascular

multimorbidity as a high-risk context for inappropriate prescribing in acute care settings.

In contrast, potentially inappropriate medication use was not associated with hospitalization in this cohort, either in the unadjusted comparison (53.5% of hospitalized versus 58.0% of discharged patients; $p=0.544$) or after multivariable adjustment. This suggests that emergency admission decisions in older adults are driven primarily by acute physiological derangement and presenting severity rather than by the appropriateness of the chronic medication regimen. Inappropriate prescribing should therefore be regarded as an important target for medication safety in its own right rather than as a proxy marker of short-term admission risk.

Study Limitations

This study has several limitations. First, it was conducted in a single tertiary emergency department, which limits external validity. Second, medication histories were obtained through patient or caregiver interviews supplemented by electronic records and are therefore subject to recall and reporting bias. Third, the cross-sectional design precludes causal inference regarding the relationship between inappropriate prescribing and clinical outcomes. Fourth, laboratory and disposition data were incomplete for a proportion of the cohort; the multivariable models were therefore restricted to complete cases ($n=144$ for the clinical model and $n=62$ for the model including laboratory variables), which reduced statistical power and may have introduced selection bias. Fifth, associations between individual chronic diseases and IMU were tested without adjustment for multiple comparisons and should therefore be regarded as exploratory and hypothesis-generating. Finally, no long-term follow-up data were available, so the effects of inappropriate prescribing on mortality, rehospitalization, and functional status could not be assessed.

Conclusion

Polypharmacy and potentially inappropriate medication use are highly prevalent among older adults presenting to the emergency department. Nearly all patients in this cohort used five or more medications, and approximately half were exposed to at least one potentially inappropriate medication according to at least one screening tool.

Coronary artery disease was significantly associated with IMU in unadjusted analyses, suggesting that older adults with cardiovascular multimorbidity may represent a particularly vulnerable subgroup. However, this association was not evaluated in a multivariable model due to statistical limitations and should therefore be interpreted cautiously.

The frequency of potentially inappropriate medication use did not differ between hospitalized and discharged patients, and IMU was not independently associated with hospitalization after multivariable adjustment. These findings suggest that acute clinical severity, rather than inappropriate prescribing, primarily drives emergency admission decisions in this population.

The low agreement observed among the Beers, STOPP, and TIME criteria highlights substantial variability in patient identification depending on the screening instrument used. This variability underscores the importance of contextual clinical judgment and supports the complementary use of multiple validated tools in geriatric emergency care.

Routine implementation of structured medication reconciliation processes and the integration of clinical pharmacists into emergency department teams may enhance medication safety in older adults. Future multicenter longitudinal studies are warranted to evaluate the long-term impact of inappropriate prescribing on mortality, rehospitalization, and functional outcomes.

Ethics

Ethics Committee Approval: This study was approved by the Erzurum Training and Research Hospital (decision number KAEK 2020/07-76; reference number 37732058-514.10, date: 06.04.2020).

Informed Consent: Written informed consent was obtained from all participants or from their legally authorized representatives before enrolment.

Conflict of Interest: None declared.

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