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Psychoactive Medication Use among Older Community-Dwelling Americans.

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Abstract

Background: Falls are a common and serious health issue among older Americans, persons aged 65 and older. A common fall risk factor is the use of psychoactive medications. There is limited recent information on the national prevalence of psychoactive medication use among older Americans.

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Drs. Haddad, Luo, and Karani had full access to all of the data in the study and take responsibility for the integrity of the data and accuracy of the data analysis.

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Acquisition of data: Haddad, Luo, Karani

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Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Objective: To estimate the prevalence of psychoactive medication use among community-dwelling older Americans and compare to previous estimates from 1996.

Methods: Data source was the 2013 Cost and Use Data files combining Medicare claims data and survey data from the Medicare Current Beneficiary Survey, an in-person nationally representative survey of Medicare beneficiaries. Participants were included if they were age 65 and older, lived in the community, and had a complete year of prescription data use. Medication use was examined for seven classes of psychoactive medications categorized by the 2015 American Geriatric Society Beers criteria as increasing fall risk. These include opioids, benzodiazepines, selective serotonin reuptake inhibitors, anticonvulsants, non-benzodiazepine sedative hypnotics, antipsychotics, and tricyclic antidepressants. Data on participant demographic factors was also collected.

Results: Among the 6,959 community-dwelling older adults studied, representing 33,268,104 community-dwelling Medicare beneficiaries, 53.3% used at least one psychoactive medication linked to falls in 2013. The most frequently used medication classes were opioids (34.9%), benzodiazepines (15.4%), selective serotonin reuptake inhibitors (14.3%) and anticonvulsants (13.3%). These estimates are considerably higher, for all classes except tricyclic antidepressants, than previous reports from 1996 using the same data source. Among most psychoactive medication classes observed, women had higher usage than men.

Conclusion: More than half of all older Americans used at least one psychoactive medication in 2013. Healthcare providers including pharmacists play a vital role in managing older adults' exposure to psychoactive medications. Medication management can optimize health and reduce older adult falls.

Keywords

older adults; elderly; falls; psychotropic drugs; opioids

BACKGROUND

Falls are the leading cause of fatal and nonfatal injuries among older adults (persons age 65 and older), accounting for approximately 60% of all injury-related emergency department visits and over 50% of injury-related deaths.¹ In 2014, approximately 29% of older adults reported falling and 10% of older adults reported a fall injury.² While not all falls result in injury, falls can result in brain injury, hip fracture, and loss of independence.³ Falls also result in a high economic cost. Cost estimates from the Centers for Disease Control and Prevention (CDC) report \$50 billion is spent annually on medical services for older adult falls.⁴ Seventy-five percent of these dollars are shouldered by government-funded programs (Medicare and Medicaid) providing healthcare to older Americans. The remaining twenty-five percent are attributed to private insurance payers and out of pocket spending.

Risk factors for falls are categorized into intrinsic factors (e.g. age, gender, poor vision, postural hypotension), extrinsic factors (e.g. home hazards, footwear, medication use), and modifiable versus non-modifiable factors.⁵ Effective strategies targeting modifiable risk factors can reduce risk of falling among older adults.⁶ Strategies target one or more modifiable risk factors such as poor balance, vision impairment, postural hypotension, or the

use of medications that increase fall risk.⁶ Psychoactive medications, those acting primarily on the central nervous system, may cause side effects that increase the risk of falls in older adults by causing vision disturbances, orthostatic hypotension, confusion, and sleepiness.^{7–9} The 2015 American Geriatric Society Beers Criteria for Potentially Inappropriate Medication Use in Older Adults identified 7 classes of psychoactive medications known to increase risk of falls, namely: opioids, benzodiazepines, non-benzodiazepine sedative hypnotics, antipsychotics, anticonvulsants, and antidepressant subclasses tricyclic antidepressants and selective serotonin reuptake inhibitors.¹⁰ Psychoactive polypharmacy, the use of multiple psychoactive medications, further increases fall risk due to the synergistic effect some medications have on cognition and physical function.^{10–13}

A previous study found that pharmacist led discontinuation of psychoactive medications used by older adults could reduce falls by 66%.¹⁴ Medication management allows for routine evaluation of patients' medication regimens for appropriateness and need for discontinuation or modifications.⁶ Pharmacists, as medication experts, are well equipped to complete comprehensive medication reviews and they can offer recommendations to providers on how to reduce high-risk medications use in older adults.

To prioritize medication management as a fall prevention strategy, it is important to track the prevalence of psychoactive medication use as a risk factor in older adults. Understanding the prevalence and any changes in use over time allows health professionals and policy makers to prioritize and evaluate the impact of reducing psychoactive medication use on older adult falls. The national prevalence of psychoactive medication use among community-dwelling older adults was last reported using data from 1996. The 2003 report by Moxey et al., using data from the Medicare Current Beneficiary Survey (MCBS), estimated that in 1996 approximately 15% of older Americans used at least one psychoactive medication with a known link to falls.¹⁵ While these data provide insight on the national prevalence of psychoactive medication use linked to falls, much has changed in the past 20 years. Factors that could influence the use of these medications include increasing availability of prescription medications, proliferate use of opioids in treating chronic pain, Medicare part D or insurance coverage for prescription medications, and healthcare provider prescribing patterns.^{16–18}

A recent study using a sample of older adults insured by the AARP® Medicare Supplement and Part D prescription plan examined risk of falls relative to use of fall-related drugs (6 classes of psychoactive medication classes with known link to falls, excluding opioids, and antiemetics).¹⁹ The study found both new and continuing users of fall-related drugs were at an increased risk of falls and would benefit from fall prevention programs.¹⁹ However, the authors declare that the prevalence of medication use in this study may not be generalizable as it included older adults' insured by only one type of Medicare Advantage coverage.

Our study aims to update estimates of psychoactive medication use with known fall risk among community-dwelling older Americans using the nationally representative and comprehensive Medicare Current Beneficiary survey, which links claims and survey data.

OBJECTIVE

Estimate the prevalence of psychoactive medication use among community-dwelling Americans, age 65 and older, and compare to previous estimates from 1996.

METHODS

This analysis used the 2013 Cost and Use Data files which represents a combination of survey data reported from the Medicare Current Beneficiary Survey (MCBS), Medicare claims, and other data from the Centers for Medicare and Medicaid Services' administrative files. The MCBS is an in-person survey that is nationally representative of Medicare beneficiaries. The survey oversamples participants over 80 years old to ensure adequate sample size. To minimize underreporting of medication use, MCBS participants are asked to save prescription containers and payment receipts to show the interviewer at the time of the survey. Additionally, the survey collects information on health services not covered by Medicare, such as over-the-counter medications. The Medicare claims data includes use and cost information on prescription drugs. Survey reports are also matched with administrative bill data to adjust for survey under-reporting. Detailed methods are described elsewhere.²⁰

Subjects were included in the analysis if they were 65 and older, lived in the community throughout the calendar year, and had a complete year of survey results. Approximately 0.2% of the study sample had no recorded medication utilization. However, the MCBS data files do not differentiate between no medication use and missing medication utilization.

The therapeutic drug classification provided by the MCBS was nondescript. Therefore, we manually created classes using guidance from the 2015 Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults¹⁰ Namely, we created 7 drug classes for opioids, benzodiazepines, non-benzodiazepine sedative hypnotics, antipsychotics, anticonvulsants, and antidepressant subclasses tricyclic antidepressants and selective serotonin reuptake inhibitors. One pharmacist reviewed individual medications and categorized them into pharmacologic classes. Two additional pharmacists then verified the accuracy of these classifications using package inserts and Lexicomp®.

To calculate prevalence, we defined "use" as taking one or more medications within the medication class during the study year. We conducted descriptive analyses of older adult demographic characteristics and estimated the prevalence of medication use in total and by gender. We used Chi-squared tests to compare differences in medication use by gender. All analyses took into account the complex-survey design elements such as strata, primary sampling units, and weights to generate estimates representative of the U.S. Medicare population and performed using SAS (version 9.3, SAS Institute Inc. Cary, NC).

This analysis did not require Institutional Review Board (IRB) review, given all data were obtained from existing de-identified data sets accessible for research purposes from the U.S. Centers for Medicare and Medicaid Services.

RESULTS

There were 6,959 community-dwelling older adults with medication use data. The 6,959 participants represented 33,268,104 community-dwelling Medicare beneficiaries. The weighted sample included more women (43.6% men and 56.4% women) (Table 1). The majority of beneficiaries were aged 65–74 years (51.5%), white (85.3%), and non-Hispanic (90.1%). Men reported higher education levels and higher income compared to women.

In total, 53.3% of older adults used at least one psychoactive medication class known to increase fall risk (Table 2). Of those, 29.6% used one psychoactive medication class, 14.5% used two psychoactive medication classes, and 9.2% used three or more psychoactive medication classes during the year (**Data not shown**). The most frequently used medication classes were opioids (34.9%), benzodiazepines (15.4%), SSRIs (14.3%), and anticonvulsants (13.3%). For all classes except tricyclic antidepressants, the prevalence of use was considerably higher than previous reports from 1996 using the same data source (Figure 1).

With the exception of non-benzodiazepine sedative hypnotics, women had higher prevalence of psychoactive medication use compared to men (Table 2). Women's use of psychoactive medications linked to falls were significantly higher than men by 76% for benzodiazepines, 75% for TCAs, 64% for SSRI, 41% for antipsychotics, 16% for anticonvulsants, and 12% for opioids.

DISCUSSION

Our findings show that in 2013, the majority of older adults (53.3%) used at least one psychoactive medication class known to increase fall risk, and women were more likely than men to use most psychoactive medications. Women's use of medications linked to falls were 12% to 76% higher depending on the medication class. Compared to the Moxey et al. study conducted in 1996,¹⁵ which also used data from MCBS, we observed that the percent of older adults using psychoactive medication classes linked to falls has increased substantially over the past 20 years for all classes except TCAs. Opioid use increased from 14.5% to 34.9%, benzodiazepine use increased from 10.4% to 15.4%, and both SSRI and anticonvulsants use more than tripled from 3.6% to 14.3% for SSRI and 2.4% to 13.3% for anticonvulsants (Figure 1).

In the AARP® Medicare insured older adult population, Musich et al. found that in 2014 46.2% of older adults used a benzodiazepine, 29.4% used an anticonvulsant, and 23.7% used an SSRI.¹⁹ While these numbers are considerably higher than our estimates, it is important to note that the prevalence of medication use in their study is limited to a sub-population of older adults - Medicare Advantage beneficiaries - and the results are not generalizable to all older adults or all Medicare beneficiaries. However, a key finding of their study is that both new and continuing users of fall-related drugs will likely benefit from medication management as a fall prevention strategy.¹⁹

Minimizing exposure to psychoactive medications in older adults is an important step in reducing adverse drug events and improving cognition and psychomotor activity; all of which can lower fall risk.^{21, 22} Both a Cochrane systematic review and the review for the

updated American and British Geriatrics Societies' (AGS/BGS) Clinical Practice Guideline for the Prevention of Falls in Older Persons found that tapering certain medications, especially psychoactive medications, was an effective way to reduce falls and fall risk.^{6, 23} The updated AGS/BGS Guideline recommends tapering psychoactive medications with a B grade (i.e., recommendation that clinicians provide this intervention to eligible patients). The CDC's Stopping Elderly Accidents and Injuries (STEADI) initiative recommends stopping these medications when possible and switching to safer alternatives or reducing medications to their lowest effective dose if stopping is not appropriate.²⁴ Similarly, numerous studies have highlighted patients' willingness to discontinue or reduce their medications if recommended by their providers.^{25–27} Pharmacist-driven patient education about medications was shown to effectively reduce the use of psychoactive medications in older adults with minimal withdrawal symptoms.²⁸

Pharmacists, as pharmacotherapy experts, can accurately classify patients' medications, evaluate appropriateness of use, address medication adverse events, and participate in shared decision making with the multidisciplinary healthcare team to stop or reduce psychoactive medications known to increase fall risk.^{24, 29} Resources such as the Screening Tool of Older Person's Prescriptions (STOPP),³⁰ AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults,¹⁰ or the anticholinergic burden indices^{31, 32} can assist pharmacists in identifying potentially inappropriate medications, including psychoactive medications, in older adults as a first step to medication management and older adult fall prevention.

Our study had several strengths and limitations. While medication use was self-reported, MCBS validates self-reported information by comparing with Medicare claims data and requesting participants to show prescription containers and payment receipts to the interviewer. These validation strategies limit recall bias and ensure that prescribed medications were filled, a step not possible when using only prescribing data. A limitation of our study was that we could not determine whether prescribing behavior, consumer preferences, or changes in healthcare delivery and payment may have contributed to the high prevalence in medication use reported in this study compared to previous estimates. Additionally, we did not examine information on dosage, the duration of use, or the use of multiple drugs within a single medication class. For this study, we also did not examine the incidence of falling in older adults who used a psychoactive medication class but only measured classes with known potential to increase fall risk as described in the AGS Beers Criteria. Future work with this data source will explore the link between high-risk medications and rate of reported falls in older adults.

CONCLUSION

Psychoactive medication use in older adults has increased over the past 20 years. Medication review and management, including reducing the use of psychoactive medications known to increase fall risk, is an effective component of fall prevention. Updating the national prevalence of medication use linked to falls is critical for the development and evaluation of fall prevention strategies aimed at optimizing older adults' use of medications. Healthcare

providers, including pharmacists, play a vital role in managing older adults' health and exposure to psychoactive medications.

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Abbreviations, Units, Proprietary (brand) Names, and Symbols

AGS	American Geriatric Society
BGS	British Geriatric Society
CDC	Centers for Disease Control and Prevention
MCBS	Medicare Current Beneficiary Survey
SSRI	Selective serotonin reuptake inhibitors
STEADI	Stopping Elderly Accidents and Injuries initiative
STOPP	Screening Tool of Older Person's Prescriptions
TCA	Tricyclic antidepressants

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KEY POINTS**Background**

- Falls in older adults (persons aged 65 and older) are common, costly and preventable.
- Psychoactive medication use in older adults is associated with physical and cognitive decline and increased risk of falls.
- Estimates of the national prevalence of psychoactive medication use in older adults were last reported in 1996.

Findings

- The majority of older adults use at least one psychoactive medication class known to increase fall risk.
- Compared to men, women were more likely to use psychoactive medications for most classes identified in the study.
- The rate of psychoactive medication use in older adults increased substantially from 1996 to 2013 using the same data source.

Figure 1:

Comparison of Psychoactive Medication Use Prevalence in Community-dwelling Older Americans From 1996 and 2013, Medicare Current Beneficiary Survey.

¹ Selective Serotonin Reuptake Inhibitor Antidepressants

² Estimate derived from Moxey E et al. Prescription drug use in the elderly: a descriptive analysis. *Health Care Financ Rev.* 2003; 24(4):127–41.

³ Source: Medicare Current Beneficiary Survey, Cost and Use Data Files, 2013.

Table 1.

Weighted demographic characteristics of adults 65 and older (N=6,959^a) by sex – Medicare Current Beneficiary Survey, 2013.

Characteristic	Total%	Men%	Women%	<i>P</i> value ^b
Sex	100.0	43.6	56.4	
Age				
65–74	51.5	52.6	50.7	0.045
75–84	34.4	34.6	34.4	
85+	14.0	12.8	15.0	
Race				
White	85.3	85.3	85.2	0.014
Black	8.7	7.8	9.3	
Other	6.1	6.9	5.5	
Ethnicity				
Non-Hispanic	90.1	90.0	90.2	0.434
Hispanic	9.5	9.5	9.5	
Other	0.4	0.5	0.3	
Education				
Less than high school	19.8	19.3	20.3	<0.001
High school degree	26.6	21.9	30.3	
Some college	29.1	28.1	29.9	
College plus	24.2	30.7	19.2	
Unknown	0.3	0.1	0.4	
Income				
Less than \$20,000	29.9	21.2	36.6	<0.001
\$20,000 – \$40,000	31.7	32.3	31.3	
More than \$40,000	38.4	46.5	32.1	

Rounding may result in estimates slightly over or under 100%.

^aUnweighted number of older adult participants.

^bChi-square test to compare for differences in distribution of demographic characteristics by sex.

Table 2.

Weighted prevalence of use of the seven psychoactive medication classes among adults 65 and older (N=6,959^a) by sex – Medicare Current Beneficiary Survey, 2013.

Medication class	Total %	Men %	Women %	<i>P</i> value ^b
Any psychoactive medication linked to falls	53.3	48.5	57.1	<0.001
Opioids	34.9	32.7	36.6	0.004
Benzodiazepines	15.4	10.8	19.0	<0.001
Selective serotonin reuptake inhibitors	14.3	10.5	17.2	<0.001
Anticonvulsants	13.3	12.2	14.2	0.037
Non-benzodiazepine sedative hypnotics	5.6	5.2	5.9	0.301
Antipsychotics	3.0	2.4	3.4	0.023
Tricyclic antidepressants	2.9	2.0	3.5	<0.001

Note: Rounding may result in estimates slightly over or under 100%.

^aUnweighted number of older adult participants.

^bChi-square test to compare for differences in medication use by gender.