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Title: Differences in Evaluating Fall Risk by Primary Care Provider Type

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Abstract

This study assessed differences in clinical fall risk assessment of older adults (65+) and clinical resources used by primary care providers (PCP). We used Porter Novelli's 2016 DocStyles survey to examine clinical behavior data from PCPs (n=1128). Compared to other practitioners, nurse practitioners (NP) reported a higher percentage of their patients were older adults. The majority of NPs reported screening for falls risk routinely, but most did not use standardized fall-risk assessments to assess risk factors. There were also differences in the types of clinical resources used by NPs and other PCPs to evaluate the safety profile of medications.

Study Highlights

- Fall risk screening, assessment, and intervention can prevent falls.
- NPs were more likely than other PCPs to screen for fall risk at each wellness visit.
- Less than half of providers reported using standardized fall-risk assessment tests.
- Less than 16% of NPs use the Beers Criteria when prescribing medications.
- Enhanced fall prevention training could improve patient care and health outcomes.

Keywords: fall screening, elderly, older adults, primary care providers, nurse practitioners, medication assessment

Introduction

The older adult (age 65+) population is expected to increase to almost 88 million by 2050.¹ Older adults are also living longer; many are living with multiple chronic diseases and using a high number of daily medications.^{2,3} These factors increase their risk for falls.^{2,3} Each year, 29% of older adults report falling, resulting in approximately 30 million falls.⁴ While not all falls result in an injury, injurious falls result in about 3 million emergency department visits and over 800,000 hospitalizations each year.⁵

In parallel with the increased number of older adults, there is expected to be an increased need for health professionals with expertise in geriatric medicine to address falls and other geriatric syndromes.⁶ Previous research reports barriers to improving geriatric training at the student level across health profession disciplines.^{6,7} These include lack of geriatrics-trained educators, limited financial incentives to pursue a career in geriatrics, and packed curricula with limited opportunities for expansion.⁶

Post training, a limited number of primary care practices report routinely assessing and addressing fall risk factors in their older adult patients.⁸ Reported barriers to managing fall risk include limited awareness about significant health impact of falls, limited knowledge about what can be done to prevent falls, lack of reimbursement for fall prevention activities, and competing health priorities.⁹⁻¹⁴

Purpose

This study describes the circumstances in which primary care providers (PCP) screen for fall risk and assess for gait and balance (GB) impairments in older adults and assesses any differences between nurse practitioners (NP) and other PCPs. In addition, the clinical resources used to review and manage medications for fall prevention is reported. This paper focuses on the specific practices of nurse practitioners (NP), as a growing workforce in primary care,^{15, 16} as well as family practitioners (FP) and internal medicine providers (IM).

Methods

Study design

We used Porter Novelli's¹⁷ 2016 DocStyles web-based survey of healthcare providers to analyze data from PCPs. Samples were randomly drawn from SERMO's¹⁸ Global Medical Panel. SERMO is a private social network for medical professionals and its panel includes over 350,000 medical professionals in the United States. Panelists are verified using a double opt-in sign up process with telephone confirmation at place of work. In June 2016, SERMO invited a random sample of eligible healthcare professionals from their main database to participate in the Docstyles survey via a web-link. Inclusion criteria for participation in the survey include practicing for at least three years, currently practicing medicine in the United States, actively seeing patients, and working in an individual, group, or hospital practice. Porter Novelli set quotas to reach at least 1,000 primary care physicians (FPs or IMs), 250 pediatricians, 250 obstetric gynecologists (OB/GYN), 250 NPs, 150 retail pharmacists, and 100 hospital pharmacists. The 2018 Docstyles survey included 144 questions, however each respondent was only asked questions relevant to their sub-specialty. Median response time varied by subspecialty. Respondents were paid an honorarium of \$21-\$90, depending on the number of questions they were asked.

A total of 3,110 health professionals were invited to participate and 2,006 completed the entire survey. The overall response rate was 64.5% and differed by specialty (NP 41.3%, OB/GYN 71.4%, FP and IM 70.5%). The surveyed sample had a higher percentage of males (sample: 70%, AMA: 63%) and had a lower mean for years in practice (sample: 17 years, AMA: 22 years) compared to IMs, FPs, and OB/GYNs in this sample to the American Medical Association Physician Masterfile (AMA). The Centers for Disease Control and Prevention (CDC) licenses access to the data from the DocStyles surveys from Porter Novelli. Personal identifiers are not included in the dataset licensed to CDC; therefore, no institutional review board approval was obtained. For the purposes of this analysis,

participants were limited to FPs, IMs, and NPs who cared for older adult patients. We excluded pediatricians, OB/GYNs, pharmacists (n=750), and PCPs who reported they didn't see patients aged 65 and older (n=28). The final sample included 1,228 PCPs including 478 FPs and 522 IMs and 228 NPs.

Survey items

DocStyles includes provider demographic information (e.g. age, gender, race/ethnicity, years in practice, practice setting) and the provider's medical practice characteristics (e.g. geographical region, socioeconomic status (SES) of the patients, average number of patients per week, practice setting type (individual or inpatient)), which we included in our analyses as covariates.

Respondents were asked "Under what circumstances do you screen your patients 65 and older for fall risk?". PCPs could select all answers that applied, and options included (1) I rarely screen older adults for fall risk, (2) if the patient presents with a fall injury, (3) if the patient has concerns about falling, or (4) at each wellness visit. The next 'select all that apply question' was "What standardized approach do you most commonly use when assessing gait and balance in older adults?". Options included (1) Timed Up and Go (TUG), (2) The 30-Second Chair Stand Test (30-SCST), (3) The 4-Stage Balance Test (4-SBT), (4) I only observe patient walking, and (5) I do not assess patient.

Lastly, we explored PCPs' use of clinical resources when prescribing a new or changing an existing medication. PCPs were asked "When prescribing a new or altering an existing medication, which of the following resources would you most likely use to determine whether the medication was safe for patients 65 and older? Options included (1) Beers Criteria for Potentially Inappropriate Medication Use in Older Adults (Beers Criteria), (2) Micromedex or Clinical Pharmacology, (3) Epocrates, (4) UpToDate or Lexicomp, (5) My electronic health records (EHR) system has a medication tool I use, (6) I refer patients to a consultant pharmacist for medication review, (7) other resources, and (8) I do not use a specific resource. During analyses we grouped Micromedex or Clinical Pharmacology, Epocrates, and UpToDate or Lexicomp into one category called, "clinical compendia."

Statistical analysis

We used SAS, version 9.3 (SAS Institute, Inc., Cary, NC) for all statistical analyses. We calculated descriptive statistics to describe provider demographics and practice characteristics by PCP. We created a new variable to describe whether the respondent used a standardized approach for assessing GB. This included any mention of having used the TUG, 30-SCST, or 4-SBT. We produced bivariate analyses to estimate the prevalence of each response for the circumstances in which fall risk screening was conducted, the standardized approaches used to assess GB, and the use of clinical resources. We used unadjusted p-values from chi-square tests to determine and report statistically significant ($p \leq 0.05$) bivariate associations across provider and practice characteristics.

Provider demographics and practice characteristics were included in a multivariate logistic regression model to produce adjusted odds ratios (aORs) and their corresponding 95% confidence intervals (CIs) for responses with significant differences by provider type among the fall circumstance and GB questions. Covariates included were PCP age group (≤ 45 and > 45), gender, race/ethnicity, years in practice (< 10 , $10-19$, ≥ 20), average number of patients per week (< 100 , ≥ 100), patient SES (poor/lower, middle, upper/affluent), percentage of patients aged 65 and older ($\leq 25\%$, $25-50\%$, $51-75\%$, $> 75\%$), practice setting (individual outpatient, group outpatient, inpatient practice), and region of practice (Northeast, Midwest, South, West).

Results

Table 1 describes provider demographics and practice characteristics by PCP type. There were significant differences across provider types for gender, race/ethnicity, years in practice, average number of patients per week, practice setting, percentage of patients over 65 seen each week, patient SES, and regions. More than 87% of NPs were female compared to a smaller percentage of FPs (34.3%) and IMs (21.7%). Overall, NPs saw fewer patients per week compared to other PCP types. Among NPs, 73.7% saw fewer than 100 patients per week, while 32.2% of FPs and 40.8% of IMs providers saw fewer than

100 patient per week. NPs saw a greater percentage of older adults (18.4%) compared to FPs (2.5%) and IMs (6.7%).

Table 1. Characteristics of respondents by primary care provider type. DocStyles survey - 2016.					
		Overall n=1228	Family Practitioner n=478	Internal Medicine Provider n=522	Nurse Practitioner n=228
Provider Characteristics			%	%	%
<i>Age</i>					
	<45	45.4	42.9	48.1	44.7
	≥45	54.6	57.1	51.9	55.3
<i>Gender*</i>					
	Female	38.8	34.3	21.7	87.3
	Male	61.2	65.7	78.3	12.7
<i>Race/Ethnicity*</i>					
	Non-Hispanic White	63.0	64.5	54.0	80.3
	Non-Hispanic Black	3.3	2.7	1.9	7.5
	Hispanic	4.2	4.6	3.8	4.0
	Asian	22.6	21.3	31.0	5.7
	Other	7.1	6.9	9.2	2.6
<i>Years in Practice*</i>					
	<10	25.5	19.5	57.8	32.9
	10-19	40.7	42.5	39.3	40.4
	≥20	33.8	38.1	33.0	26.8
Practice Characteristics					
<i>Average number of patients/week*</i>					
	<100	43.6	32.2	40.8	73.7
	≥100	56.4	67.8	59.2	26.3
<i>Practice setting*</i>					
	Individual outpatient	20.2	22.0	18.4	20.6
	Group outpatient	63.9	47.1	56.7	59.2
	Inpatient practice	15.9	4.0	24.9	20.2
<i>Patients seen age ≥65/week*</i>					
	≤25%	24.3	34.9	12.8	28.1
	25-50%	42.2	47.5	45.0	24.6
	51-75%	26.3	15.1	35.4	29.0
	>75%	7.3	2.5	6.7	18.4
<i>Patient SES*</i>					
	Poor/Lower	31.5	32.2	26.6	41.2
	Middle	24.5	34.9	37.9	25.4
	Upper/Affluent	34.0	32.9	35.4	33.3
<i>Region*</i>					
	West	26.6	20.7	32.6	25.0
	Midwest	20.0	24.1	17.8	16.7
	Northeast	33.4	33.5	28.7	43.9
	South	20.0	21.8	20.9	14.5

Chi-square tests were used to determine differences across provider type.

†Poor/Lower ≤\$49,999; Middle \$50,000 - \$99,999; Upper ≥ \$100,000;

*Unadjusted chi-square test for categorical variables was significant at a p-value ≤ 0.05.

Among all PCP types, 56.4% stated they would screen for fall risk during each wellness visit, 52.9% said they would screen when an older patient presents with a fall injury, and 51.9% stated they would screen if their older patient was concerned about falling (**Table 2**). More NPs and FPs reported screening older adult patients for falls during each wellness visit compared to IMs (64.0%, 62.3%, and 47.7% respectively). Most PCPs did not use a standardized test to assess GB. Among NPs, 64.9% stated they observed the patient walking compared to 48.5% of FPs and 44.6% of IMs. The most common standardized assessment used was the TUG. The TUG was used by 31.4% of FPs, compared to 28.6% of IMs and 13.2% of NPs.

Clinical compendia (47.0%) was most frequently used to evaluate the safety profile of a medication followed by embedded resources in EHR systems (20.2%; Table 2). NPs were the highest reported users of clinical compendia (53.9%), but lowest users of EHR (15.8%) compared to other PCPs. The Beers Criteria was used by 13.5% of all PCP types.

Table 2: Falls screening, assessment, and medication resources used by type of primary care provider. DocStyles survey - 2016				
	All PCP n=1228 %	Family Practitioner n=478 %	Internal Medicine Provider n=522 %	Nurse Practitioner n=228 %
Provider screens older patient for falls when the patient:				
Presents with a fall injury*	52.9	53.1	56.1	45.2
Has concerns about falling	51.9	51.3	54.6	46.9
At each wellness visit*	56.4	62.3	47.7	64.0
Rarely screens for fall risk	8.1	8.4	8.2	7.5
Functional assessments commonly used to assess gait and balance *				
Any standardized test	45.6	48.3	50.3	30.3
<i>Timed Up and Go Test</i>	26.6	31.4	28.6	13.2
<i>30-Second Chair Stand Test</i>	10.8	9.8	11.7	10.5
<i>4-Stage Balance Test</i>	8.2	7.1	10.0	6.6
Observe only	50.0	48.5	44.6	64.9
Does not assess	4.5	3.1	5.6	4.8
Medication resource use*				
Clinical compendia [†]	47.0	39.4	50.9	53.9
Beers Criteria	13.5	17.8	8.6	15.8
Electronic health records	20.2	20.7	21.7	15.8
Consultant pharmacist referral	3.4	2.5	4.2	3.5
Other	4.1	5.2	2.5	5.3
None	11.8	14.4	12.1	5.7

Chi-square tests were used to determine differences across provider type.

[†]Clinical Compendia includes Micromedex or Clinical Pharmacology, Epocrates, and UpToDate or Lexicomp

*Unadjusted chi-square test for categorical variables was significant at a p-value of ≤ 0.05

After adjusting for provider and practice characteristics, IMs had lower odds of reporting that they screen for fall risk at each wellness visit (aOR=0.5; CI=0.3-0.8) compared to NPs (**Table 3**). There was no significant difference between FPs and NPs. IMs and FPs had higher odds than NPs of reporting that they screen for fall risk when the patient presents with a fall injury. IMs and FPs also report higher odds of using a standardized GB test compared to NPs. Independent of PCP type, PCPs who see a larger proportion of older adults (more than 25% of their patients are 65 and older) were more likely to

screen for fall risk during each wellness visit and to use a standardized GB assessment than PCPs whose patient population was younger (fewer than 25% of patients are 65 and older) (data not shown).

Table 3. Primary care providers' adjusted odds (aOR) of screening for fall risk (N=1228). DocStyles survey - 2016.

	At each wellness visit		Presents with a fall injury		Uses standardized GB test	
	aOR	95% CI	aOR	95% CI	aOR	95% CI
<i>Provider Type</i>						
Family practice provider	1.0	0.7, 1.5	1.6	1.1, 2.3	2.0	1.3, 3.0
Internal medicine provider	0.5	0.3, 0.8	1.7	1.2, 2.5	1.8	1.2, 2.7
Nurse practitioner (ref)	1.0	--	1.0	--	1.0	--

Bolded values indicate significance ($p \leq 0.05$).

Note: Adjusted for age, gender, race/ethnicity, years in practice, region, percentage of patients ≥ 65 seen per week, practice setting, patient SES, and average number of patients seen per week.

Discussion

Around half of all PCPs in this sample indicated routinely screening for fall risk at each wellness visit. After adjusting for demographic and practice characteristics, IMs had lower odds of screening at each wellness visit compared to NPs. NPs may be more likely to screen during wellness visits because their training emphasizes a holistic approach, including the protection and promotion of health.¹⁹⁻²¹ Previous studies have reported that the majority of older adults who experience a fall do not seek medical care or talk to a healthcare provider about their fall.²² These results suggest that there is an unmet need for fall screening among older adult patients at all healthcare encounters. The American and British Geriatric Society (AGS/BGS) guideline recommends annual screening for fall risk for all adults age 65 and older²³ and falls screening is a reimbursable component of the Medicare Annual Wellness Visit.²⁴

AGS/BGS guidelines recommend patients that screen at risk for a fall be further assessed for modifiable risk factors including GB limitations.²³ The guideline suggest using a standardized assessment like the TUG or Berg Balance Scale. NPs were least likely to report using a standardized GB assessment. This difference persisted after adjusting for demographic and practice characteristics. Standardized GB assessment tests may help PCPs identify specific underlying mobility deficits contributing to the individual's fall risk and select appropriate interventions.^{23, 25, 26} Examples of standardized GB tests

include the TUG, the 30-SCST, and the 4-SBT. These GB assessments are validated, have high test retest reliability, and may be administered in primary care settings.²⁷⁻³⁰ Using a standardized test allows PCPs to evaluate changes in gait or balance for those patients who participated in fall prevention activities and to compare repeated test results over time and between providers.³¹⁻³⁴ Of the standardized approaches to assess GB, the TUG had the highest reported use but was used by fewer than 30% of all PCPs and only 13% of NPs. This may be due to a lack of knowledge about GB tests. Evidence suggest that few NPs received adequate geriatric training due to the lack of didactic geriatric coursework being required or offered in nursing curriculums.^{6, 35-37}

Most PCPs, including NPs, reported using clinical compendia to guide clinical judgement around medication use in older adults. However, less than a fifth of PCPs, including less than 16% of NPs, reported using the AGS's Beers Criteria which highlights medication classes deemed inappropriate for use in older adults and contains information relevant to older adult prescribing that may not be found in standard clinical compendia.³⁸ Previous research found that PCPs have either not heard of or used the Beers Criteria when prescribing medications for older adults.^{39, 40} One barrier to appropriate prescribing in older adults is a lack of formal education on older adult prescribing.⁴⁰ The Beers Criteria is an important resource for NPs that emphasizes the benefit of limiting inappropriate medication prescribing in older adults and aims to reduce polypharmacy. NPs can use these criteria to identify medication that place older adults at high risk of adverse drug events and initiate regimen change.

Referral to a consultant pharmacist to manage medications was the least reported medication resource. Pharmacist directed patient care may increase medication adherence, improve patient awareness of medications they are taking, and reduce adverse medication events.⁴¹ Collaborative practice agreements between PCP and pharmacists are one way to incorporate pharmacists in the healthcare delivery system to improve the overall health of older adults.⁴²

Limitations

This study has several limitations. First, the 2016 DocStyles is a paid survey, and while providers are randomly invited, they are selected from a private online social media platform. There is potential for selection bias and providers who participated in the study are not necessarily representative of other providers. The sample included more male internists and family practitioners than the AMA Masterfile demographics. In addition, healthcare providers that participated in the DocStyles survey were younger and had been practicing for a shorter length of time compared to providers from the AMA Masterfile. Findings from this study may not be generalizable to all FPs, NPs, and IMs. The response rate for NPs was less than 50% and lower than other specialties; thus, there is potential for non-response bias by NPs. Finally, DocStyles survey on self-reported actions may be different than their actual behavior.

Conclusion

NPs in our sample reported serving a larger proportion of older adults compared to other PCPs and are more likely to routinely screen for fall risk during annual wellness visits. This makes NPs well positioned to address older adult fall prevention in the primary care setting. [Additional training](#) on the value of using standardized GB tests may help NPs ensure they are appropriately identifying and managing their patient's fall risk over time. CDC's fall prevention initiative, Stopping Elderly Accidents Deaths and Injury ([STEADI](#)) and [the AGS's Beers Criteria](#) are free resources available to NPs to assist them in their older adult fall prevention and safe medication prescribing efforts.

Resources for Older Adult Safe Prescribing and Deprescribing

1. [Agency for Healthcare Research and Quality \(AHRQ\) Medication Reconciliation Toolkit](#)
2. [American Geriatrics Society 2019 Updated Beers Criteria](#)
3. [Alternative Medications for High-Risk Medications in the Elderly](#)
4. [Deprescribing Algorithms](#)
5. [CDC's STEADI website](#)

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