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Willingness to Change Medications Linked to Increased Fall Risk: A Comparison between Age Groups

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Abstract

Objective: To describe and compare two age groups' knowledge of medications linked to falls and willingness to change these medications to reduce their fall risk.

Method: We analyzed data from community-dwelling adults age 55 and older (n=1,812), including 855 adults aged 55 to 64 years and 957 older adults (65 and older) who participated in the 2016 summer wave of the ConsumerStyles survey. ConsumerStyles is an annual web-based survey. The data are weighted to match the US Current Population Survey proportions on nine US Census Bureau demographic characteristics.

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Author contributions

Dr. Haddad had full access to all of the data in the study and takes responsibility for the integrity of the data and accuracy of the data analysis.

Study concept and design: Haddad, Karani, Bergen, Marcum

Acquisition of data: Haddad

Analysis of data: Haddad

Interpretation of data: Haddad, Karani, Bergen, Marcum

Drafting of the manuscript: Haddad

Critical revision of the manuscript for important intellectual content: Haddad, Karani, Bergen, Marcum

Statistical analysis: Haddad

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Measurements: Survey respondents were asked about medication use, knowledge of side effects, their willingness to change their medications to reduce fall risk, communication in the previous year about fall risk with their healthcare provider, and their comfort in discussing fall risk with their healthcare provider. All data were weighted to match the 2016 population estimates. Descriptive statistics and chi-square tests ($p \leq 0.05$) were used to identify differences between the two age groups.

Results: About one-fifth of all respondents reported using at least one class of medication that increases fall risk. Older adults were less likely to report using medications for mood or sadness, less likely to report knowing the side effects of pain medications, and more willing to change their sleep medications compared with their younger counterparts. Among all respondents using these medication classes, less than one-third knew the potential fall-related side effects. However, most of them expressed willingness to change their medication if advised by their healthcare provider.

Conclusion: Most older adults were unaware of potential fall risks associated with medications prescribed to address pain, difficulty sleeping, mood or sadness, and anxiety- or nervousness-related health issues. However, most were willing to change their medication if recommended by a healthcare provider.

Keywords

Older adults; elderly; falls; medications

Introduction

Falls impose a large healthcare burden with over 3 million adults ages 65 and over (older adults) treated for a fall in an emergency department and more than 850,000 hospitalized in 2016.[1] Among adults ages 55–64, falls resulted in over one million emergency department visits and over 152,000 hospitalizations.[1] About 2,600 adults ages 55–64 and 29,000 older adults died due to a fall in 2016.[1] The United States older adult population is projected to grow by almost 50% between 2016 and 2030,[2] resulting in increased falls and healthcare utilization if more is not done to prevent falls.[3] Multiple risk factors are associated with falls in the aging population, some of which are modifiable such as vestibular disorders, postural hypotension, and use of certain medications, and can be targeted to reduce falls.[4]

In this study, we focused on the use of medications linked to falls. Medications used to treat pain (e.g opioid analgesics), sleep disorders (e.g. over-the-counter antihistamines, sedative hypnotics), depression (e.g. antidepressants), and anxiety (e.g. benzodiazepines) typically affect the central nervous system (CNS-active). They can cause side effects such as dizziness, sedation, confusion, blurred vision, and orthostatic hypotension that increase fall risk.[5] Older adults using CNS-active medications are at an increased risk of more pronounced side effects compared with younger adults due to age–related physiologic changes accounting for variability in drug metabolism and decreased drug clearance (i.e. slower elimination of the drug from the body leading to prolonged exposure).[6–8] Additionally, when taken together, CNS-active medications can have a synergistic effect on cognition and physical function.[9] Taking multiple CNS-active medications, known as CNS polypharmacy, is associated with an increased risk of fall injuries and hospitalizations in

older adults. The incident rate ratio for hospitalization for falls in older adults on CNS-active medication increased from 1.22 for those on one CNS-active medication to 3.15 for those on five or more.[10]

One way to optimize medication use is to evaluate a patient's medications routinely for potential tapering.[11] Tapering or deprescribing is the process of stopping or reducing drugs with the goal of managing polypharmacy and improving health outcomes.[11] Minimizing exposure to CNS-active medications is an important intervention to reduce fall risk in older adults. Previous research showed that stopping or reducing the dose of CNS-active medications can decrease falls by 66% in older adults.[12] Although physician guidelines exist on how to stop or reduce CNS-active medications,[13,14] tapering can sometimes be challenging.

Patient preferences and willingness to taper medications play a central role in deprescribing. [15] Providers face challenges in tapering medications in older patients because they may have different priorities of health goals or inadequate information on the risks and benefits of certain medications.[16] To our knowledge, there are no studies representative of the U.S. population that explore older adults' willingness to taper medications linked to falls. The objectives of this study were to examine adults ages 55–64 and older adults' knowledge and attitudes about medications linked to falls and their willingness to change medications to reduce fall risk. We included adults ages 55–64, as they will soon age into a higher risk patient population. Additionally, their knowledge of the risks and benefits of specific medications could influence how they care for an older loved one.

Methods

ConsumerStyles Survey

The data used in this study came from the summer wave of Porter Novelli's 2016 ConsumerStyles survey. The ConsumerStyles survey is built annually from a series of online consumer marketing surveys that gather information on health-related attitudes and behaviors to inform communication and health promotion activities. The summer wave, conducted from June 24 to July 11, 2016, was sent to 6,166 potential respondents who had previously completed the spring wave. A total of 4,203 adults (18 and older) completed the survey for a response rate of 68%. Study respondents received an honorarium of $5 for completing the summer wave survey. The summer wave of ConsumerStyles includes a weighting variable that provides a weight for the data to match the U.S. Current Population Survey proportions for nine factors: sex, age, household income, race/ethnicity, household size, education, census region, and metropolitan status, and whether or not the respondent had access to internet prior to joining the panel.[17] For the current study, we restricted the analysis to adults ages 55 to 64 and age 65 and older (older adults).

Study Variables

Information on the following respondent demographics was recorded: age, sex, race/ethnicity, education, marital status, income, employment status, and whether they lived in a metropolitan statistical area or not. The Census Bureau defines a metropolitan statistical area

as a geographical region with high population density and close economic ties. Respondents were also asked to report their health status (excellent, very good, good, fair, or poor) and whether they had specific health conditions (such as anxiety, arthritis, chronic pain, depression, or insomnia).

Survey respondents were asked about medication use. First, they were asked about prescription medications '*How many prescription medications are you currently taking?*' and were allowed to input a number between 0 and 99. Then, they were asked a series of questions about whether or not they took medications to treat a series of health issues typically treated with CNS-medications: 1. *'Do you take prescription medicine to help you with pain?'*, 2. '*Do you take either prescription or over-the-counter medicine to help you sleep?',* 3. *'Do you take prescription medicine to help with your mood or for sadness?',* and 4. *'Do you take prescription medicine to help with anxiety or nervousness?'* Individuals who said yes, were asked two follow-up questions for each type of medication they reported using: 1. 'W*hich, if any, of these medicines have side effects (like sleepiness, light-headedness, or dizziness) that might make you fall?'* and *2*. '*How likely would you be to change or reduce your medicine if your doctor thought its side effects (like sleepiness, light-headedness, or dizziness) might make you fall?'* For the second question, respondents could answer on a 4-point Likert scale (very unlikely, somewhat unlikely, somewhat likely, and very likely).

All respondents regardless of reported medication use were asked whether someone had spoken to them about medications linked to falls in the past 12 months. Finally, they were asked with whom they would be comfortable talking to about medications linked to falls. Possible answers to both questions included doctor, pharmacist, nurse, another healthcare provider, family member or caregiver, or no one, with multiple answers allowed. Respondents who reported no prescription medication use and no use of medications to address the selected health issues were excluded from the analysis for the last two questions.

Statistical Analysis

All analyses were performed using SPSS Statistics version 23 (SPSS Inc. Chicago, IL). Then, Chi-square tests were used to compare the two age groups (55–64 years versus 65+) using an alpha of <0.05 to determine statistical differences between groups.

Results

The 1,812 respondents included 855 adults ages 55 to 64 and 957 older adults. Older adults were more likely to take five or more medications, more likely to report having arthritis, but less likely to report having anxiety and depression compared to adults age 55–64 (Table 1).

Approximately one-fifth (21.1%) of all respondents in the sample (all adults 55 and older) reported using medications to treat pain, followed by sleep disorder (17.9%), mood or sadness (10.0%), and anxiety (9.8%) medications (Table 2). Among those reporting use of a medication class, less than one-third of respondents reported knowledge of fall related side effects (Table 2). However, most were willing to change their medication if recommended by their doctor to reduce fall risk (Figure 1). Older adults were less likely to report using mood

or sadness medications, less likely to report knowing the side effects of pain medications, and more willing to change their sleep medication compared with their younger counterparts (Table 2). There were no other statistically significant differences between the age groups in knowledge of side effects and willingness to change their medication use.

Among respondents who reported who reported medication use, 85% of adults ages 55 to 64 and 81.9% of older adults reported not talking to anyone in the past 12 months about medications that might make them fall (Figure 2A). Of the respondents taking one or more prescription medications, more than 80% reported being comfortable talking to their doctor, and approximately 40% reported being comfortable talking to a pharmacist or nurse about medications that may make them fall (Figure 2B). A limited number of respondents stated they would not be comfortable discussing medications and fall risk with anyone.

Discussion

In our study, about one-quarter of adults ages 55 to 64 and one-fifth of older adults reported using one of the medications to treat a health issue typically treated with CNS-active medications. However, less than a third of those who reported use also reported knowledge of potential fall-related side effects associated with each medication type. Importantly, we found that the majority of respondents would be willing to change a medication that increases fall risk if recommended by a healthcare provider. CNS-active medications, including opioid-receptor agonists, benzodiazepines, sedative hypnotics, and antidepressants, have side effects that alter cognition and physical function and are associated with falls and fall recurrence in older adults.[5, 18] Physiological changes with advancing age may account for variability in drug metabolism and decreased drug clearance potentially leading to more pronounced adverse drug events in older adults.[6] Provider-driven patient education on medication-related side effects and fall risk could encourage patients and providers to work together and optimize medication use.

Older adults were more likely to report using a higher number of medications compared with adults ages 55 to 64. Previous studies have shown polypharmacy was independently associated with a significant decline in cognitive and physical capability,[19] and increased risk of falls (14% increase in fall risk with the each medication added beyond 4 medications).[20] Therefore, targeting older adults for tapering unnecessary medication has potential health benefits. Providers who participated in a qualitative study regarding polypharmacy acknowledged a number of factors as potential barriers to tapering.[16, 21] These included their hesitancy to stop medications prescribed by other physicians, patients' strong beliefs in their medications, concerns about the health consequences of stopping certain medications, and the need to follow clinical guidelines which often influence the number of medications needed to manage a disease state.[21] Providers also reported concerns about applying guideline-directed care in older adults due to the difficulty of performing risk stratification for individual patients and balancing the benefits and harms to older patients.[16] Better tools are needed to quantify risks and benefits of medication use in older adults and to give healthcare providers guidance on how to communicate these issues to patients.

Tapering of CNS-active medications is feasible and has a clear benefit in reducing risk of falls and injuries in older adults. Stopping CNS-active medications, including benzodiazepines, was shown to be associated with improved cognition, improved psychomotor activity and a reduction in falls.[22] Moreover, the EMPOWER cluster randomized trial found that pharmacist-driven medication education to patients led to a reduction of benzodiazepine use by 77% without withdrawal symptoms.[23] Healthcare providers can take the initial step by educating patients on the dangers of CNS-active therapies and the health benefits of tapering unnecessary medications while maintaining appropriate care for patient health. Our findings indicate that older adults are willing to change a medication with appropriate provider guidance. This confirms previous reports that patients trust their providers to make decisions about their prescription medications and will discontinue medications at their provider's recommendation.[24, 25]

Given patient willingness to discuss fall risk, healthcare providers should routinely initiate the conversation by screening for fall risk, assessing the patient's modifiable fall risk factors, and intervening to reduce risk by using evidence-based strategies, including the effective management of medications linked to falls.[15] Falls risk screening and assessment can be conducted and reimbursed as part of the Medicare Annual Wellness Visit.[26] In addition, falls risk screening, including a medication assessment, is a quality measure under the Medicare Access and CHIP Reauthorization ACT (MACRA), which offers value-based reimbursement for services through a Merit based Incentive Payment System (MIPS).[26] Furthermore, Centers for Disease Control and Prevention developed the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative, based on the American and British Geriatrics Societies' clinical practice guidelines, to provide tools and resources to assist healthcare providers with fall prevention.[27] Resources related to medication management include the Screen, Assess, Facilitate, and Educate (SAFE) approach, highlighting steps for a targeted medication review, and the Medications Linked to Falls factsheet, providing guidance on managing high-risk medications in older adults (www.CDC.GOV/STEADI). With quality measures in place and resources available, providers are incentivized and well equipped to engage in fall-risk screenings, including medication assessment. Documenting any attempt to taper medications (including complete cessation or dose reduction) of fall-risk increasing drugs or rationale for why tapering is not warranted enables evaluation of the impact of medication management on falls and can help justify medication management as an effective strategy. Given the complexity of falls as a geriatric syndrome, these efforts must continue long term to implement a fall-risk reduction strategy.

Patient-engaged conversations on tapering with healthcare providers have been associated with increased patient knowledge and information seeking behaviors about medication related harms and openness to tapering potentially harmful medications.[28] The Patient Activation Measure (PAM), developed at the University of Oregon, can measure a patient's ability to manage their own health by assessing knowledge, skill, and level of confidence to manage their own health.[29, 30] This measure can be used to tailor individual patient interventions to reduce medication harms and adverse events. Previous studies show that patients with higher scores on PAM are more likely to engage in preventive behaviors, adhere to treatment regimens, and obtain regular healthcare screenings.[29, 31] Highly activated patients are more likely to have better health outcomes and lower healthcare costs

due to the reduced need for hospitalizations and emergency department visits as compared to less activated patients.[31–33]

Our study has limitations. First, the sampling approach used by ConsumerStyles is not random. The dataset is weighted to be representative of the U.S. population based on selected factors only; nonetheless, research comparing consumer panel data with national population probability sampling data supports the use of ConsumerStyles data.[34] Second, medication use was self-reported and may be underestimated due to social desirability bias of underreporting CNS-active medications.[35] Third, knowledge of medication side effects and attitude towards medication stopping or tapering was also self-reported and may have been overestimated. Finally, our analyses combined all older adults age 65 and older as one group due to a small sample size in older ages. Future studies are needed to explore willingness to change medications linked to falls among older adults in the oldest age categories (75–84 and 85+).

In conclusion, with the exception of knowledge of the side effects of pain medications, and reported willingness to change sleep medications, both age groups reported similar knowledge and attitudes. Most older adults are unaware of the fall risks associated with medications used for certain health issues including pain, difficulty sleeping, mood or sadness, anxiety or nervousness but they are willing to change medication if a healthcare provider communicates the risk. Patient and provider awareness about fall-risk increasing drugs, including CNS-active medications, and guidance on tapering and medication management may help lower the risk of adverse drug events, falls, injuries and deaths.

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Appendix

Elements of Financial/Personal Conflicts	Yara Haddad		Mamta Karani		Gwen Bergen		Zachary Marcum	
	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		X		X		X		X
Grants/Funds		X		X		X		X
Honoraria		X		X		X		X
Speaker Forum		X		X		X		X
Consultant		X		X		X		X
Stocks		X		X		X		X
Royalties		X		X		X		X
Expert Testimony		X		X		X		X
Advisory Board		X		X		X		X
Patents		X		X		X		X
Personal Relationship		X		X		X		X

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Impact Statement

We certify that this work is novel. Our research aimed to understand older adult attitudes toward medications linked to increased fall risk, and their openness to tapering. The majority of respondents were unaware of the fall risk associated with medications they took to address pain, difficulty sleeping, mood or sadness, anxiety or nervousness but were willing to change their medications to reduce their fall risk if their healthcare provider advised them to change.

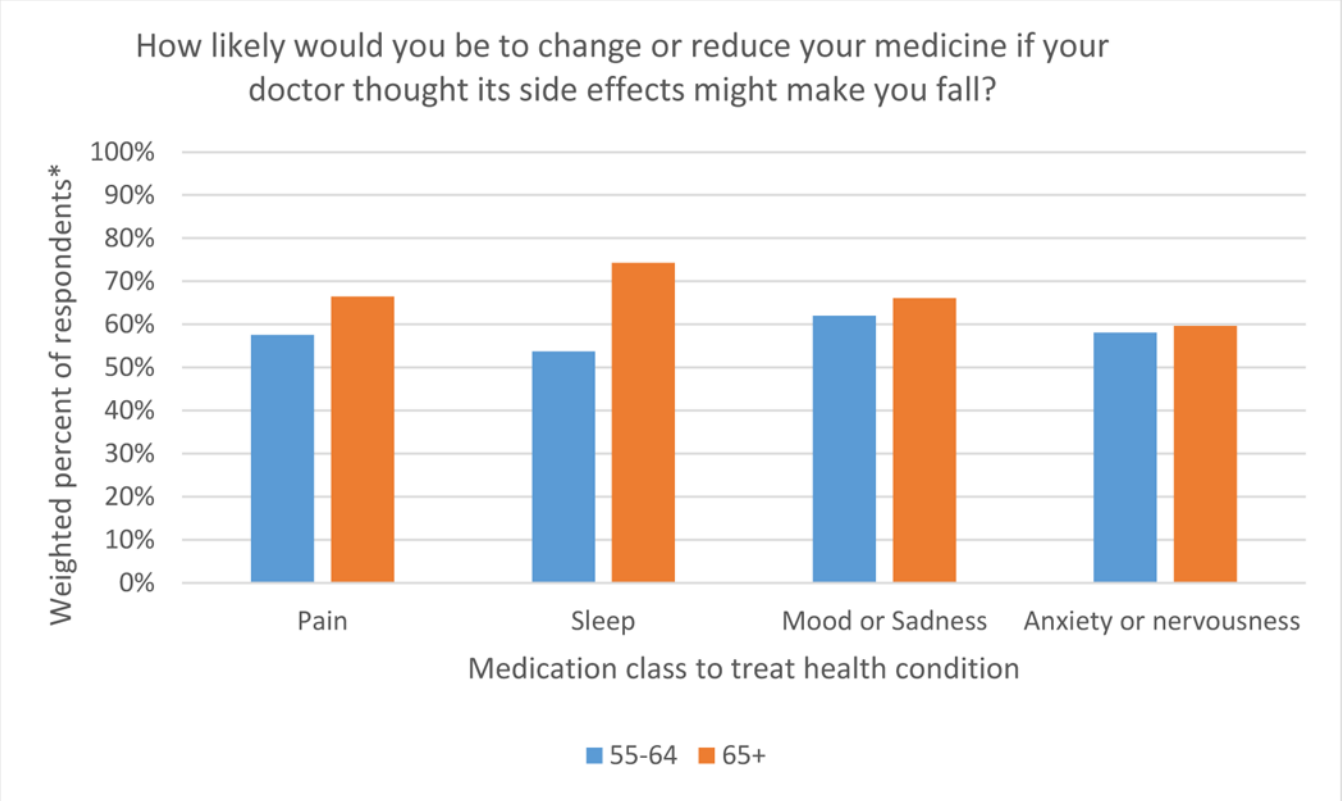
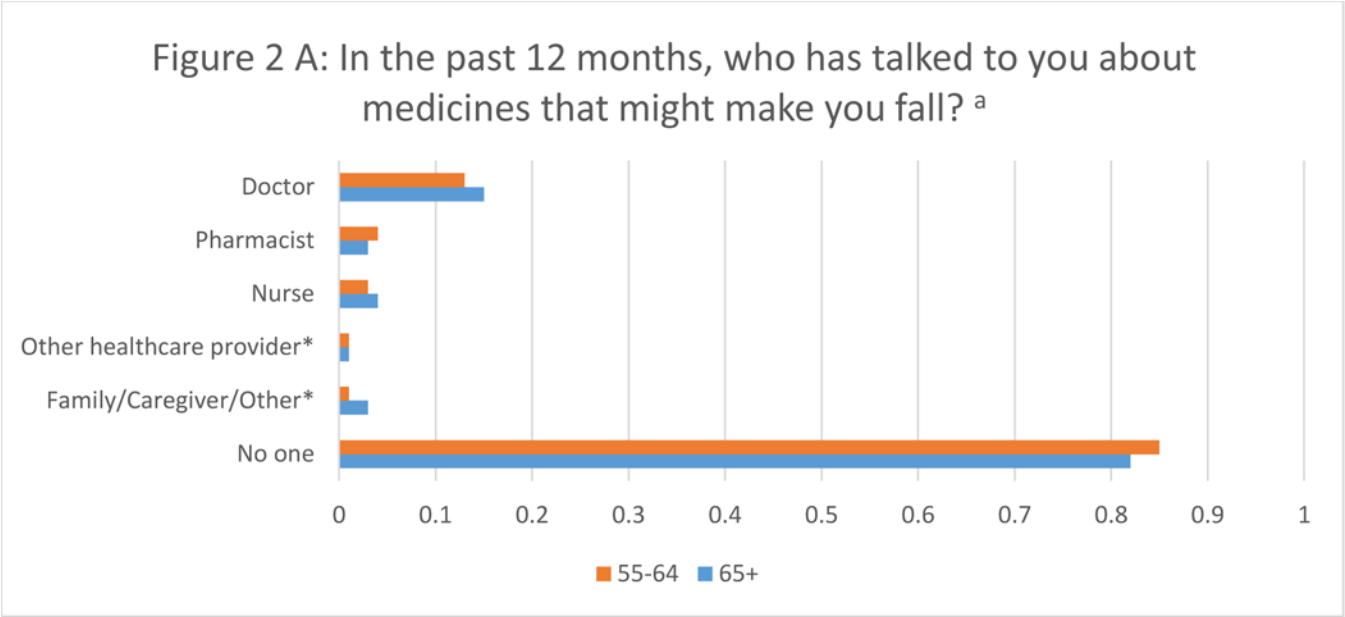


Figure 1:

Willingness to change fall-related medications: comparison of age groups.

Source: ConsumerStyles 2016.

*Only respondents reporting use of medication class per health condition were included



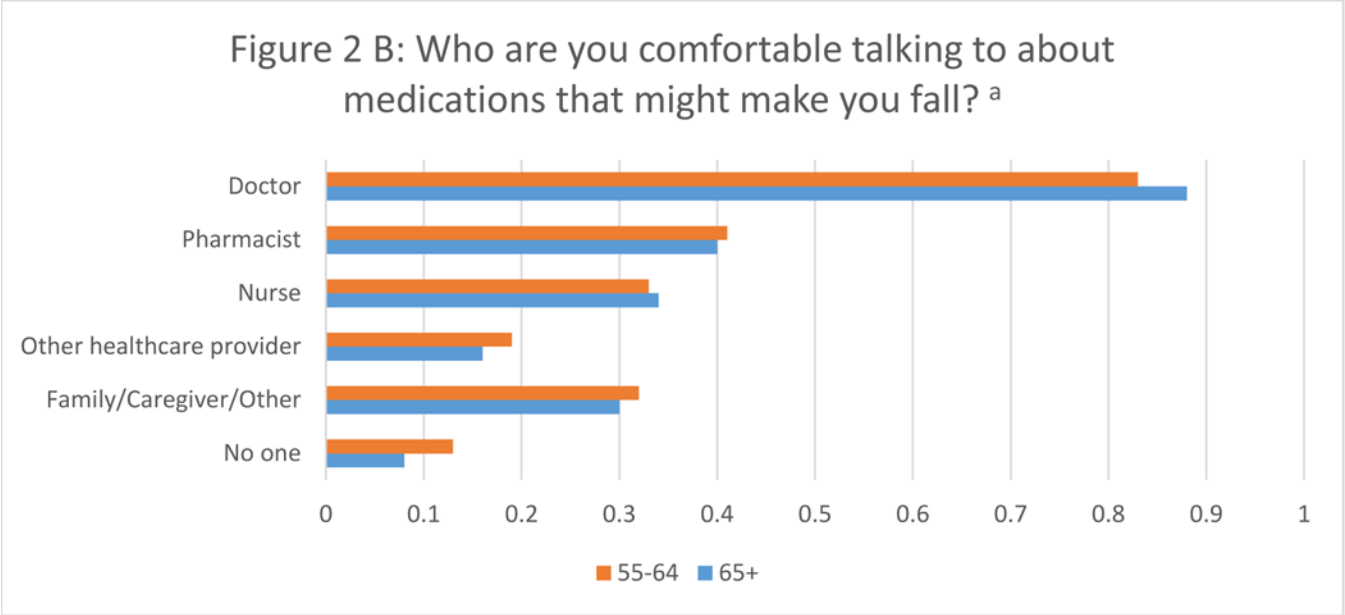


Figure 2:

Provider-patient communication on medicines linked to falls by provider type

Source: ConsumerStyles 2016

Respondents reporting no prescription medication use and no use of medications to address selected health issues were excluded (total unweighted count= 1417; age 55-64 n=610; age ≥65 n=807).

2A: Respondents reported previous communication with provider about medicines that may increase fall risk.

2B: Respondents reported to whom they would be comfortable talking.

[a] Categories are not mutually exclusive.

* Estimate is unstable due to small sample size (unweighted n<20).

Table 1.

Demographic, health and medication characteristics of adults age 55 and older.

	Total Sample (55 years and older) unweighted n = 1812		Adults age 55–64 years old unweighted n = 855		Adults age 65 years and older unweighted n = 957		
Respondent Demographics	**Unweighted n**	**Weighted %[a]**	**Unweighted n**	**Weighted %[a]**	**Unweighted n**	**Weighted %[a]**	**P-value[b]**
Gender							0.163
Male	891	46.2	424	48.1	467	44.5	
Female	921	53.8	431	51.9	490	55.5	
Race/Ethnicity							0.18
Non-Hispanic White	1446	71.3	660	69.3	786	72.9	
Non-Hispanic Black	165	11.6	91	13.2	74	10.3	
Other including Hispanic	201	17.1	104	17.5	97	16.8	
Education							0.216
<High School	134	14.1	57	12.5	77	15.5	
High School/College no Degree	1009	61.3	461	62.9	548	59.9	
≥College	669	24.6	337	24.6	332	24.6	
Marital Status							0.958
Married	1118	62.0	529	61.9	589	62.1	
Not Married	694	38.0	326	38.1	368	37.9	
Income ($)							<0.001
<19,999	277	15.4	164	19.1	113	12.0	
20,000–59,999	706	35.0	253	27.2	453	41.9	
60,000–99,999	392	25.8	205	27.1	187	24.7	
≥ 100,000	437	23.8	233	26.6	204	21.4	
Employment							<0.001
Employed	661	35.9	501	57.2	160	17.3	
Not Employed	1151	64.1	354	42.8	797	82.7	
Residential Location[c]							0.141
Non-metropolitan Area	288	16.2	144	17.0	144	15.5	
Metropolitan Area	1524	83.8	711	83.0	813	84.5	
Self-reported Health Status[d]							0.414
Very Good/ Excellent	745	39.6	344	37.8	401	41.2	
Good	724	41.2	356	44.2	368	38.6	
Fair	281	15.8	123	14.4	158	16.9	
Poor	60	3.4	32	3.5	28	3.4	
Self-reported Health Issue[d]							
Anxiety	228	12.0	131	14.7	97	9.6	*0.003*
Arthritis	590	32.9	222	27.7	368	37.4	*<0.001*

	Total Sample (55 years and older) unweighted n = 1812		Adults age 55–64 years old unweighted n = 855		Adults age 65 years and older unweighted n = 957		
Respondent Demographics	**Unweighted n**	**Weighted %[a]**	**Unweighted n**	**Weighted %[a]**	**Unweighted n**	**Weighted %[a]**	**P-value[b]**
Chronic Pain	305	16.3	144	16.5	161	16	*0.780*
Depression	202	10.2	126	13.4	76	7.4	*<0.001*
Insomnia	198	10.0	103	10.2	95	9.8	*0.797*
Number of Prescription Medications Currently Taking[d]							<0.001
0	379	21.1	240	28.7	139	14.4	
1 – 4	933	52.3	418	49.4	515	54.9	
≥ 5	491	26.6	193	21.9	298	30.8	

[a]Data are weighted to match the US Current Population Survey proportions of the US population according to census measures.

[b]The P-value is a comparison between the two age groups: 55 to 64 and 65 and older.

[c]The metropolitan variable is classified as being in a metropolitan statistical area or not, based on US Census Bureau population density standards.

[d]Respondents were not required to answer any of the questions and could exit the survey at any time.

Source: ConsumerStyles 2016.

Table 2.

Reported medication use, knowledge of fall-related side effects, and willingness to change medications with fall risk: a comparison of age groups.

	Total Sample (55 years and older)			Adults age 55–64 years old			Adults age 65 years and older			
Health issue	**Unweighted n asked**	**Unweighted affirmative response**	**Weighted %[a]**	**Unweighted n asked**	**Unweighted affirmative response**	**Weighted %[a]**	**Unweighted n asked**	**Unweighted affirmative response**	**Weighted %[a]**	**P-Value[b]**
Medication Use[c]										
Pain	1812	370	21.1	855	192	23.2	957	178	19.3	0.061
Sleep		338	17.9		161	18.4		177	17.5	0.650
Mood or sadness		196	10.0		123	13.0		73	7.5	<0.001
Anxiety or nervousness		191	9.8		102	10.5		89	9.2	0.419
Aware of Fall-Related Medication Side Effects[d]										
Pain	370	103	28.8	192	66	33.9	178	37	23.4	0.037
Sleep	338	77	21.4	161	45	23.1	177	32	20.0	0.538
Mood or sadness	196	33	16.5	123	24	19.6	73	--	--	0.230
Anxiety or nervousness	191	42	23.3	102	24	23.0	89	--	--	0.927
Willing to Change Medications with Fall Risk[e]										
Pain	370	228	61.9	192	115	57.6	178	113	66.5	0.102
Sleep	338	218	64.4	161	91	53.8	177	127	74.3	<0.001
Mood or sadness	196	121	63.6	123	75	62.0	73	49	66.1	0.606
Anxiety or nervousness	191	115	58.9	102	62	58.1	89	53	59.7	0.843

... Estimate not reported due to small cell size (unweighted n < 20).

[a]Data are weighted to match the US Current Population Survey proportions of the US population according to census measures.

[b]The *P*-value is a comparison between the two age groups adults ages 55 to 64 years and older adults (≥65 y).

[c]Reported use of medication classes to treat a health issue typically treated with centrally active medications.

[d]Reported knowledge of fall-related medication side effect.

[e]Reported willingness to change the medication if recommended by doctor.

Source: ConsumerStyles 2016.