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Impact of a medication therapy management intervention targeting medications associated with falling: Results of a pilot study

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Abstract

BACKGROUND—The use of fall risk–increasing drugs (FRIDs) by older adults is one factor associated with falling, and FRID use is common among older adults. A targeted medication therapy management intervention focused on FRID use that included prescription and over-the-counter (OTC) medications, along with follow-up telephone calls was designed.

OBJECTIVE—The purpose of this pilot study was to examine preliminary effects of a medication therapy management (MTM) intervention focused on FRIDs provided by a community pharmacist to older adults.

DESIGN—Randomized, controlled trial.

SETTING—One community pharmacy.

PARTICIPANTS—Eighty older adults who completed a fall prevention workshop.

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MAIN OUTCOME MEASURES—The main outcome measures were the rate of discontinuing FRIDs, the proportion of older adults falling, and the number of falls. A secondary outcome was the acceptance rate of medication recommendations by patients and prescribers.

RESULTS—Thirty-eight older adults received the targeted MTM intervention. Of the 31 older adults using a FRID, a larger proportion in the intervention group had FRID use modified relative to controls (77% and 28%, respectively; $P < 0.05$). There were no significant changes between the study groups in the risk and rate of falling. Medication recommendations in the intervention group had a 75% acceptance rate by patients and prescribers.

CONCLUSION—A targeted MTM intervention provided by a community pharmacist and focused on FRID use among older adults was effective in modifying FRID use. This result supports the preliminary conclusion that community pharmacists can play an important role in modifying FRID use among older adults.

For older adults, falls are common and costly, and they are caused by several factors, including elements in their internal living environment (e.g., throw rugs), elements in their external environment (e.g., ice on sidewalks), poor vision, and their physical status (e.g., leg strength and balance issues).^{1,2} Another factor contributing to falling is the use of medications associated with falling.^{2–6} Modifying older adults' use of medications associated with falling likely improves the safety of medications used by older adults and is an important component in preventing falling by older adults. Effective fall prevention has the potential to reduce serious fall-related injuries, emergency department visits, hospitalizations, nursing home placements, and functional decline.⁷

Several therapeutic categories of drugs are classified as fall risk-increasing drugs (FRIDs)⁸ because their use is associated with falling.^{3–6} In an observational study to assess fall incidence after dose reduction or discontinuation of FRIDs, older fallers used an average of 2.34 FRIDs on a regular basis.⁸ Current falls prevention guidelines suggest a multifactorial fall risk assessment include a medication review.⁷ Community pharmacists are in a unique position to assess and modify FRIDs used by older adults, via medication therapy management (MTM), to improve medication use and possibly prevent falling because of their accessibility to older adults.

The concept of providing comprehensive medication reviews for older adults to modify FRID use has been explored using randomized controlled trials with varying results.^{9,10} In one study, medication reviews were provided by trained general practitioners in Australia, and benzodiazepine use was not significantly modified relative to controls after 12 months.⁹ In the other study, community pharmacists provided medication consults and significantly more subjects had FRID use modified relative to controls (14.0% versus 5.4%) after 12 months.¹⁰ In addition, three randomized controlled trials assessed the effects of modifying FRIDs on falling among older adults.^{9–11} The study involving community pharmacists showed no impact of modifying FRID use on the risk and rate of falling, relative to controls.¹⁰

A limitation of the previous randomized controlled trial examining the impact of community pharmacists providing medication consults related to FRIDs was that the study did not

include over-the-counter (OTC) medications, which can contain FRIDs, especially medications used for sleeping.¹² In addition, the acceptance rate of pharmacists' recommendations to modify FRID use was low (24.4%).¹³ To address these gaps, we designed and implemented a pilot study of a targeted MTM intervention provided by a community pharmacist that focused on FRIDs, including OTC medications. In addition, to facilitate the acceptance of medication recommendations made by the community pharmacist, the intervention involved training the community pharmacist in the fundamentals of motivational interviewing. A detailed description of this training and the intervention was published previously.¹⁴

Objectives

The purpose of this study was to examine preliminary effects of the targeted MTM intervention focused on FRIDs provided by a community pharmacist to older adults. The primary effects studied were the rate of discontinuing FRIDs and the risk and rate of falling. Secondary effects of the MTM intervention were characteristics of the recommendations made related to FRIDs, such as the medication that was the subject of a recommendation, to whom and how a recommendation was communicated, and acceptance rate.

Methods

Study design

Details of the planning and implementation process for this study were published previously.¹⁴ A randomized, cluster, controlled experimental design was used with a 6-month follow-up period. The unit of randomization was a fall prevention program workshop coordinated by a community-based resource center. The intervention group received a face-to-face MTM intervention and direct feedback regarding their medication use from one trained community pharmacist in a private consultation room at one independently owned, retail community pharmacy.¹⁴ The control group received a mailed pamphlet describing medication use and falls. English-speaking participants, age 65 years and older, who had fallen in the past 12 months or had a fear of falling, who participated in the workshop, and were capable of providing their own consent were eligible for the study. There was no screening for FRID use before study enrollment. The study was approved by the Health Sciences Institutional Review Board at the University of Wisconsin.

As this was a pilot study to examine feasibility of recruiting older adults and implementing the MTM intervention, the goal was to enroll 80 subjects, 40 in each study group, who completed the falls prevention workshop. The pilot study was not powered to detect statistically significant differences between study groups in outcomes, such as the proportion of subjects who discontinued medications or the number of falls.

Subject recruitment

Enrollment by older adults in the fall prevention workshops was voluntary and was not influenced in any way by the researchers. At the last meeting of each workshop, two trained study recruiters met with workshop participants to introduce the study and answer questions. Approximately 4 to 5 days after the last meeting of each workshop, a trained study recruiter

telephoned prospective study subjects who had not enrolled in the study. After study enrollment, trained student pharmacist interviewers telephoned each study subject to complete a 60-minute preintervention survey, which included a medication history.¹⁴ Study enrollment occurred over a 13-month time period (October 2011 to November 2012).

Intervention procedures

The 60-minute face-to-face targeted medication review and follow-up process was designed to follow the core elements of MTM, with the exception of a personal medication record.¹⁵ Using information collected during the preintervention survey, the community pharmacist conducted a targeted medication therapy review (MTR) with the goal of identifying and modifying (i.e., stopping, lowering dose) FRID use. Clinical algorithms for five therapeutic categories of drugs (e.g., antidepressants, antihypertensives, benzodiazepines, neuroleptics, sedatives, hypnotics) and certain additional drugs with high anticholinergic properties (e.g., sedating antihistamines, oxybutynin) with good literature support showing association with falls among persons 65 years and older^{3–6} were developed by a geriatric pharmacotherapy expert to standardize the process of reviewing and modifying FRID use.

Based on the targeted MTR, the community pharmacist developed a medication-related action plan (MAP) that included recommendations to modify FRID use. The community pharmacist discussed the recommendations with the subject and provided the MAP to the subject. If needed, the pharmacist communicated recommendations and supplemental information to corresponding prescribers via either fax or telephone. The community pharmacist documented and followed up on all recommendations to determine whether they were accepted or rejected. The initial and follow-up interactions between the community pharmacist and the study subjects were audio recorded. Immediately after the medication review, the community pharmacist gave the subject a packet containing a commercially available pamphlet describing the role of medications in falls and six monthly falls calendars and instructions to complete them. The community pharmacist was paid for each MTM intervention consisting of the initial visit and a follow-up telephone call.

Data sources

Telephone surveys and interviews

Baseline data related to demographics, health status, health services utilization, and medication use were collected during the preintervention telephone survey.¹⁴ For each prescription, OTC, or herbal medication that a subject reported using, data were collected related to the name, strength, dose, frequency of use, length of use, and problems using each medication. All subjects received five monthly, 30-minute, follow-up telephone interviews conducted by student pharmacists. Subjects in the intervention group received an additional follow-up telephone interview from the community pharmacist 3 months after the initial targeted MTR. During the monthly follow-up telephone interviews, data were collected about the number of falls experienced using the falls calendars, any changes (e.g., stopped using) to medications mentioned in previous interviews, and information about medications started within the past 30 days. After 6 months, all subjects participated in a postintervention

telephone survey with a trained student pharmacist designed to collect data about current and new medications and health status information

Documentation of medication-related problems

For subjects in the intervention group, the community pharmacist documented information related to each FRID medication-related problem including the name and strength of the FRID, the nature of the problem, the recommended solution to the problem (e.g., stop, start, change dose), to whom (e.g., subject, prescriber) the recommendation was communicated, how (e.g., in person, via telephone, via fax) the recommendation was communicated, and the date of the recommendation. The community pharmacist also documented the result of the recommendation (e.g., accepted, modified, not accepted, and why) and the date of the result.

Because of time constraints, another pharmacist (not the pharmacist providing the MTM to subjects in the intervention group) reviewed medication profiles after the preintervention telephone survey using the clinical algorithms and identified FRID medication-related problems for subjects in the control group. The name and strength of the FRID, the nature of the problem, and the recommended solution to the problem (e.g., stop, start, change dose) were documented. Recommendations derived from a medication-related problem for the control group were also documented, but were not communicated to subjects or prescribers.

Electronic medical record

Study data collected during all the telephone interviews and information documented as part of a MAP were input into a web-based, electronic medical record (EMR) for each subject. The EMR was created by the study team and housed on a secure server. Both pharmacists and the student pharmacists accessed the EMRs throughout the study.

Dependent variables

The first primary dependent variable was whether a subject discontinued all FRIDs by the end of the 6-month follow-up time period. For all subjects, discontinuation was determined by examining the medication profile collected during the monthly follow-up telephone interviews and the 6-month postintervention survey contained in the EMR. For a medication to be considered discontinued, three items needed to be present: (1) the medication had to be listed among currently used medications on the medication profile collected during the preintervention telephone survey; (2) a stop date for the medication, self-reported by the subject, had to be listed in the medication profile; and (3) no evidence was present in the medication profile that the medication was restarted after the stop date. For subjects in the intervention group, we also examined the pharmacist's documentation in the EMR related to recommendations made for FRIDs. Evidence of discontinuation from the medication profiles and the pharmacists' documentation for subjects in the intervention group was compared to identify any inconsistencies regarding discontinuation of a FRID. There were no cases of inconsistency. For a subject to be classified as discontinuing FRIDs, all FRIDs used at baseline had to be stopped by the end of the 6-month postintervention period.

The second primary dependent variable was whether a fall occurred and the number of falls during the follow-up period. Data collected as part of the five monthly follow-up telephone

interviews were used to determine this variable. The total number of falls experienced by each subject was summed across the five follow-up interviews.

Secondary dependent variables were related to characteristics of the medication-related problems for FRIDs in the intervention and control groups. From the EMR, we determined the number of medication-related problems, the drugs involved, and to whom and how any recommendations were communicated. Because the recommendations made for subjects in the control group were not communicated to patients or prescribers, we did not examine to whom and how the recommendations were communicated for the control group. Whether a recommendation in the intervention group was accepted or not accepted was determined using information documented by the community pharmacist in the EMR and the medication profiles for subjects in the intervention group. Changes in FRID use by subjects in the control group were determined by reviewing their medication profiles.

Data analysis

Descriptive statistics were calculated for each study group, and comparisons between study groups were made. Differences in subject characteristics were determined using *t* tests and chi-squared tests of independence. Differences in FRID modification and falling were assessed using chi-square tests of independence. An a priori significance level of 0.05 was selected for statistical tests.

Results

Of the 81 consenting subjects who attended fall prevention workshops, 39 were assigned randomly to the intervention and 42 to the control groups. A total of 39 and 41 older adults in the intervention and control groups, respectively, participated in the preintervention interview. One subject in the intervention group and one subject in the control group dropped out of the study following the preintervention survey, stating they were too busy to participate. All the 38 older adults in the intervention group who made an appointment with the community pharmacist received the targeted MTM intervention. No enrolled older adults were lost to follow-up.

Table 1 summarizes the demographic and health characteristics of the intervention and control group subjects who completed the preintervention interview. Approximately 40% of all subjects had fallen in the past 6 months, and 75% of those who had fallen self-reported no more than two falls. Approximately 20% of subjects in each study group self-reported that they were afraid of falling.

Based on FRID medication-related problems documented in the EMR, 33% of intervention group subjects and 44% of control group subjects were using at least one FRID (Table 2). A significantly larger proportion of subjects stopped using all FRIDs in the intervention group (76.9%) compared with the control group (27.8%; $P < 0.05$). The proportion of subjects who self-reported that they fell during the postintervention period and the number of falls among those who fell were not significantly different between the two study groups (Table 3).

OTC medications used for sleeping were the most common focus of medication-related problems documented in the EMR across both study groups (Table 4). In the intervention group, the 16 medication-related problems each resulted in recommendations, of which eight (50%) were communicated by the pharmacist to the patient in person, five (31.3%) were communicated by the patient to the prescriber in person, and three (18.7%) were faxed by the pharmacist to the prescriber. A total of 56% (n = 9) of the recommendations were for OTC medications, and 89% of those recommendations were communicated directly to the subject. A total of 75% (n = 12) of the recommendations in the intervention group were accepted (75% [6/8] by the patients, 60% [3/5] by prescribers following patient communication, and 100% [3/3] by prescribers following fax communication by the pharmacist). Each of the unaccepted recommendations involved medications used for sleeping (i.e., zolpidem, diazepam, doxylamine, acetaminophen with diphenhydramine).

Discussion

One goal of this pilot study was to examine the impact of a community pharmacist intervention on discontinuing the use of FRIDs. The results showed that the community pharmacist contributed to the discontinuation of FRID use for a significantly larger proportion of subjects using a FRID (76.9%) relative to the control group (27.8%). Discontinuation of FRIDs by older adults in the control group may have been in response to the mailed pamphlet they received that described medications and their role in falling or a result of the Stepping On fall prevention workshop. We did not assess why or how medications were discontinued in the control group. A previous study showed that 16.4% of patients using a medication associated with falling and receiving an intervention from a community pharmacist either discontinued or decreased the dose of medications associated with falling.¹⁰ The impact of the community pharmacist on discontinuing FRIDs in the present study was larger than in the previous study.

One explanation for the larger impact in the present study is that the acceptance rate of the recommendations was 75% compared with 24.4% in a previous study.¹⁰ Including OTC medications and empowering patients to discontinue use likely contributed to the acceptance rate. More than half of the recommendations were for OTC medications, and all but one of the recommendations for OTC medications were communicated directly to the subject. The high acceptance rate (87.5%) of the OTC recommendations likely was because OTC use could be modified by a subject without consulting a prescriber.

Another explanation for the high acceptance rate of recommendations in this study is that the subjects likely were motivated to follow the community pharmacist's recommendations because the subjects had self-selected to participate in a falls prevention workshop. The older adults likely were concerned about falling and consequently could have been more diligent in following the recommendations. In addition, the workshop is a behaviorally oriented health education program, which may increase subjects' knowledge and self-confidence to engage in behaviors, such as talking with their prescribers to reinforce the pharmacist's recommendations.^{16,17} A study currently in progress is comparing the effects of the MTM intervention described in this article between groups of older adults who did and did not participate in a fall prevention workshop before study enrollment. How and to

whom the medication recommendations are made and whether the acceptance rates are comparable across the two study groups will be examined.

Overall, patients played an important role in accepting recommendations. The targeted MTM intervention protocol we developed for the current study incorporated core motivational interviewing principles, and we trained the pharmacist to use this approach.¹⁴ Future research will analyze the audio-taped interactions to identify ways the community pharmacist was effectively able to communicate the value of the medication change, enabling subjects to accept recommendations and communicate recommendations to prescribers. Helping subjects to identify their motivations for change and increasing their confidence to communicate medication recommendations to prescribers could be a more effective method of modifying drug use compared with pharmacists communicating recommendations to prescribers. Although studies evaluating mediating factors within motivational interviewing talk are limited, client change talk and client confidence have shown a small to medium effect on outcome, and they seem to be consistent mediators of change.¹⁸

Similar to a previous study, the proportion of subjects falling and the number of falls during the follow-up time period were not different between study groups.¹⁰ Furthermore, the results showed that there was no impact of the intervention on the proportion of previous fallers who fell during the follow-up period or the proportion of FRID users who fell during the follow-up period. It is likely that some falls are caused by medications, whereas others are not. A current study is delineating the likely cause of a fall and the timing of a fall relative to FRID discontinuation, and it may allow a more precise measure of the impact of an MTM intervention on falls caused by medication use.

Limitations

The follow-up period in the current study was 6 months compared with 12 months in a previous study.¹⁰ It is possible that subjects could have restarted medications after the 6-month follow-up period. However, most of the medications discontinued in the intervention group occurred within 1 month of the MTM session and lasted throughout the follow-up period. Subjects received monthly telephone follow-up calls to assess health status and drug use. It is possible that the monthly telephone calls served as reminders about fall risk and medication use and contributed to the impacts of the targeted MTM, as well as medication changes seen in the control group. The extent of this possible effect is unknown. A current study includes follow-up telephone calls every 3 months.

Pharmacy students, a community pharmacist, and a clinical pharmacist collected study data. Two concerns when using multiple people to collect data are consistency in procedures to collect data and understanding of definitions of study variables. Training that focused on definitions of data elements and procedures to follow to collect data were provided to each person collecting study data. In addition, data collection procedures and the data collected were audited by study team members and feedback was supplied to data collectors at various times during the study period.

There is the possibility that subjects reported that they stopped taking a FRID, but continued to use the medication anyway, because they knew that the study was about FRID use. Prescription drug refill records from a pharmacy claims database would verify this issue for prescription medications. However, many of the FRIDs targeted were OTC drugs, and they likely would not appear in a claims database. Although inaccurate reporting by subjects of discontinuing a medication is a possibility, the extent of inaccurate reporting is unknown. Other information could have been reported inaccurately by subjects. The training program and interview guide that was developed for the pharmacy students who collected data included probes the students used to help limit inaccuracies in information provided by subjects.¹⁹

The study protocol did not screen for FRID use before study enrollment. As a result, only 38.8% of enrolled subjects across the two study groups were using a FRID. One implication of not screening for FRID use is a reduction in power of the statistical tests examining differences across the two study groups because of the inclusion in the sample of subjects that could not have FRID use discontinued. Power analysis of the difference between study groups in the proportion of all subjects who had FRID use discontinued was 0.33. Conversely, power analysis of the difference between study groups in the proportion of FRID users who had FRID use discontinued was 0.80. Screening for FRID use before study enrollment is a component of a current study.

Conclusion

The cause of falls among older adults is multifaceted, and several medications have been associated with falling. Mechanisms to modify the use of FRIDs are an important component of fall prevention programs. The results of this pilot study suggest that a community pharmacist–provided MTM intervention focused on FRID use among older adults was effective, relative to controls, in discontinuing FRIDs, especially among older adults using FRIDs. The results support the preliminary conclusion that community pharmacists can play an important role in modifying FRID use among older adults. A larger randomized controlled trial is needed to provide additional evidence of the effects of a community pharmacist–provided MTM intervention on modifying FRID use.

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References

1. Masud T, Morris R. The epidemiology of falls. *Age Ageing*. 2001; 30(Suppl 4):4–7. [PubMed: 11326716]
2. Michael Y, Whitlock E, Lin J, Fu R, O'Connor E, Gold R. Primary care–relevant interventions to prevent falling in older adults: a systematic evidence review for the U.S. preventive services task force. *Ann Intern Med*. 2010; 153(12):815–825. [PubMed: 21173416]

3. Leipzig R, Cumming R, Tinetti M. Drugs and falls in older people: a systematic review and metaanalysis, I: psychotropic drugs. *J Am Geriatr Soc.* 1999; 47(1):30–39. [PubMed: 9920227]
4. Leipzig R, Cumming R, Tinetti M. Drugs and falls in older people: a systematic review and metaanalysis, II: cardiac and analgesic drugs. *J Am Geriatr Soc.* 1999; 47(1):40–50. [PubMed: 9920228]
5. Hartikainen S, Lönnroos E, Louhivuori K. Medication as a risk factor for falls: critical systematic review. *J Gerontol A Biol Sci Med Sci.* 2007; 62(10):1172–1181. [PubMed: 17921433]
6. Woolcott J, Richardson K, Wiens M, Patel B, Marin J, Khan K, Marra C. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med.* 2009; 169(21):1952–1960. [PubMed: 19933955]
7. The Panel on Prevention of Falls in Older Persons, American Geriatrics Society and British Geriatrics Society. Summary of the updated American geriatrics society/british geriatrics society clinical practice guideline for prevention of falls in older persons. *J Am Geriatr Soc.* 2011; 59(1): 148–157. [PubMed: 21226685]
8. van der Velde N, Stricker B, Pols H, van der Cammen. Risk of falls after withdrawal of fall-risk-increasing drugs: a prospective cohort study. *Br J Clin Pharmacol.* 2006; 63(2):232–237. [PubMed: 16939531]
9. Pit S, Byles J, Henry D, Holt L, Hansen V, Bowman D. A quality use of medicines program for general practitioners and older people: a cluster randomised controlled trial. *Med J Aust.* 2007; 187(1):23–30. [PubMed: 17605699]
10. Blalock S, Casteel C, Roth M, Ferreri S, Demby K, Shankar V. Impact of enhanced pharmacologic care on the prevention of falls: a randomized controlled trial. *Am J Ger Pharmacol.* 2010; 8(5): 428–440.
11. Campbell A, Robertson M, Gardner M, Norton R, Buchner D. Psychotropic medication withdrawal and a home-based exercise program to prevent falls: a randomized, controlled trial. *J Am Geriatr Soc.* 1999; 47(7):850–853. [PubMed: 10404930]
12. Ferreri S, Roth M, Casteel C, Demby K, Blalock S. Methodology of an ongoing, randomized controlled trial to prevent falls through enhanced pharmaceutical care. *Am J Ger Pharmacol.* 2008; 6(2):61–81.
13. Casteel C, Blalock SJ, Ferreri S, Roth MT, Demby KB. Implementation of a community pharmacy-based falls prevention program. *Am J Ger Pharmacol.* 2011; 9(5):310–319.
14. Mott D, Martin B, Breslow R, Michaels B, Kirchner J, Mahoney J, Margolis A. The development of a community-based, pharmacist-provided falls prevention MTM intervention for older adults: relationship building, methods, and rationale. *Innov in Pharm.* 2014; 5(1):1–13.
15. American Pharmacists Association, National Association of Chain Drug Stores Foundation. Medication therapy management in pharmacy practice: core elements of an MTM service model (version 2.0). *J Am Pharm Assoc.* 2008; 48:341–353.
16. Bandura, A. Self-efficacy: The Exercise of Control. New York: WH Freeman and Company; 1997.
17. Jones F, Riazi A. Self-efficacy and self-management after stroke: a systematic review. *Disabil Rehabil.* 2011; 33(10):797–810. [PubMed: 20795919]
18. Apodaca T, Longabaugh R. Mechanisms of change in motivational interviewing: a review and preliminary evaluation of the evidence. *Addiction.* 2009; 104(5):705–715. [PubMed: 19413785]
19. Margolis A, Martin B, Mott D. Trained student pharmacists' telephonic collection of patient medication information: feasibility and fidelity. *J Am Pharm Assoc.* In review.

Table 1

Demographic and health characteristics of study subjects

Characteristic	Intervention (n = 39)	Control (n = 41)
Age, years (mean $\pm$ SD)	74.9 ($\pm$ 20.2)	76.3 ($\pm$ 6.12)
Sex		
Male, n (%)	9 (23.1)	8 (19.5)
Body mass index, kg/m ² (mean $\pm$ SD)	31.1 (5.18)	28.1 (6.29) ^a
Race, n (%)		
White	38 (97.4)	41 (100)
Nonwhite	1 (2.6)	0 (0.0)
Ethnicity, n (%)		
Non-Hispanic	38 (97.4)	41 (100)
Hispanic	1 (2.6)	0 (0.0)
Marital Status, n (%)		
Married	15 (38.5)	25 (61.0)
Divorced	4 (10.3)	1 (2.4)
Widowed	17 (43.6)	11 (26.8)
Never married	3 (7.6)	4 (9.8)
Highest education level, n (%)		
Less than high school	1 (2.6)	0 (0.0)
High school graduate	9 (23.1)	13 (31.7)
Some college or vocational	14 (35.9)	11 (26.8)
College graduate	10 (25.6)	10 (24.4)
Graduate school	5 (12.8)	7 (17.1)
General health status, n (%)		
Poor	0 (0.0)	0 (0.0)
Fair	3 (7.6)	7 (17.1)
Good	22 (56.5)	21 (51.2)
Very Good	14 (35.9)	12 (29.3)
Excellent	0 (0.0)	1 (2.4)
How afraid of falling are you? n (%)		
Not at all	10 (25.6)	7 (17.0)
A little	11 (28.2)	20 (48.8)
Somewhat	9 (23.1)	5 (12.2)
Very Afraid	9 (23.1)	9 (21.0)
Fallen in the past 6 months, n (%)	16 (41.0)	16 (39.0)
If, yes, how many falls?		
1	11 (68.8)	8 (50.0)
2	1 (6.2)	4 (25.0)

Characteristic	Intervention (n = 39)	Control (n = 41)
3	3 (18.8)	3 (18.8)
>3	1 (6.2)	1 (6.2)
Use a walking aid such as a cane or walker, n (%)	23 (59.0)	27 (65.9)

^a $P < 0.05$, *t* test.

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Table 2

FRID use by study group

	Intervention	Control
Number of subjects using at least one FRID at time of intervention ^a	13/39 (33.3%)	18/41 (43.9%)
Number of subjects using one FRID	10/39 (25.6%)	14/41 (34.1%)
Number of subjects using >1 FRID	3/39 (7.7%)	4/41 (9.8%)
Number of FRID users who stopped using all FRIDs	10/13 (76.9%)	5/18 (27.8%) ^a

For the intervention group, the time of the intervention was when the community pharmacist provided the medication therapy management intervention to the subject. For the control group, the time of intervention was when the clinical pharmacist examined the medication profile collected during the preintervention survey.

^a $P < 0.05$, Chi-squared test of independence, 1 d.f.

FRID, fall risk-increasing drug.

Table 3

Proportion of subjects who fell and number of falls by study group

	Intervention	Control
Number of subjects who fell during the postintervention period	11/39 (28.2%)	10/41 (24.4%)
Number of falls		
1	5/11 (45.5%)	7/10 (70.0%)
2	4/11 (36.3%)	1/10 10.0%)
3	1/11 (9.1%)	2/10 (20.0%)
>3	1/11 (9.1%)	0/10 (0.0%)

Table 4

Characteristics of FRID-related problems

Characteristic	Intervention (n = 13)	Control (n = 18)
Number of medication-related problems	16	22
Associated drugs		
Acetaminophen with diphenhydramine	5 (31.4%)	1 (4.5%)
Diphenhydramine	3 (18.8%)	4 (18.2%)
Oxybutynin	2 (12.5%)	3 (13.6%)
Amitriptyline	2 (12.5%)	0
Lorazepam	0	2 (9.1%)
Clonazepam	0	2 (9.1%)
Cyclobenzaprine	0	2 (9.1%)
Zolpidem	1 (6.2%)	1 (4.5%)
Doxylamine	1 (6.2%)	1 (4.5%)
Diazepam	1 (6.2%)	0
Fluoxetine	1 (6.2%)	1 (4.5%)
Alprazolam	0	1 (4.5%)
Mirtazapine	0	1 (4.5%)
Trazadone	0	1 (4.5%)
Temazepam	0	1 (4.5%)
Meclizine	0	1 (4.5%)

FRID, fall risk-increasing drug.