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2023

### Outcome of pharmacist-led medication review and intervention in ElderPlace patients with recent falls

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## Background

- One-third of adults over the age of 65 experience a fall each year, which can have significant impacts on individual quality of life and healthcare utilization as a result of sustained injuries and emergency department (ED) visits or hospitalizations.<sup>1,2</sup> While falls are frequently multifactorial, polypharmacy and potentially inappropriate medications are known factors that increase the risk of falls in this population.
- The Program of All-inclusive Care for the Elderly (PACE) is a nation-wide medical care model for medically frail individuals who are otherwise eligible for skilled nursing facility level of care.
- All participants in the ElderPlace PACE program who experience a fall are reported to their interdisciplinary care team and documented in the EMR.
- In October of 2021, a standardized workflow and documentation was developed by a PGY2 geriatrics resident to allow pharmacists to consistently and efficiently perform medication reviews following patient falls.
- A prospective study was completed last year following patients out to 6 months from their index fall event to compare the number subsequent falls both before and after this standardized workflow was implemented.<sup>3</sup> At the conclusion of this study, there was no statistical difference in subsequent falls between the pre- and post-standardization groups.

### Purpose:

- The purpose of this study is to extend the investigation time frame from the previous study to look at the difference in patient outcomes following an index fall event both pre- and post-standardization of these pharmacist medication reviews out to one year in order to see if additional time will allow for a larger effect size.

## Outcomes

### Primary outcomes

- The number of subsequent injurious falls, defined as leading to an ED visit, hospitalization, or fracture pre- and post-standardization of the pharmacist-led medication reviews.

### Secondary outcomes

- The total number of reported falls one year following the index fall
- The number and type of medication recommendations made by the clinical pharmacist
- The number of medication recommendations accepted by the provider

## Methods

### Study design

- Multicenter, retrospective chart review

### Inclusion criteria

- Adult patients 18 years and older
- Enrolled as participants at Providence ElderPlace
- Fall documented between October 18- November 30, 2020, or October 17- November 30, 2021

### Exclusion criteria

- Classified as palliative care level II or hospice care at time of index fall event

### Statistics

- The primary outcome will be assessed using a Mann-Whitney U test
- Acceptance of medication recommendations will be evaluated using a chi-squared test

Table 1: Baseline Characteristics

	Control group (n=135)	Post-standardization group (n=126)
Age (years)†	77 (58-102)	76 (56-99)
Female sex, n (%)	87 (64)	90 (71)
Race, n (%)		
White	115 (85)	103 (82)
Black	9 (7)	8 (6)
Asian	3 (2)	2 (2)
Hispanic/Latino	1 (1)	0 (0)
American Indian/Alaska Native	1 (1)	3 (2)
Other/unknown	6 (4)	9 (7)
Weight (kg)†	80.7 (37.6-189.6)	77.4 (40.8-163.3)
Frail, n (%)	63 (47)	50 (40)
Place of residence at time of index fall, n (%)		
Independent home	8 (6)	10 (8)
Adult care home	26 (19)	16 (13)
Assisted living facility	44(33)	44 (35)
Residential care facility	28 (21)	38 (30)
Memory care unit	25 (19)	14 (11)
Skilled nursing facility	4 (3)	4 (3)
Any fall in the previous 6 months, n (%)	84 (62)	76 (60)
Number of falls in the previous 6 months†	2 (1-18)	2 (1-14)
Diagnosis of dementia, n (%)	85 (63)	75 (60)
Diagnosis of osteoporosis, n (%)	39 (29)	44 (35)
Receiving antiresorptive or anabolic osteoporosis treatment	11 (28)	18 (41)
Number of high-risk medications prescribed†	3 (0-6)	3 (0-7)
High risk medications that may contribute to a fall, n (%)		
Antihypertensive	89 (66)	86 (68)
Antipsychotic	36 (27)	42 (33)
Antidepressant	85 (63)	84 (67)
Benzodiazepine (BZD)	22 (16)	15 (12)
Cholinesterase inhibitor	30 (22)	27 (21)
Non-BZD sedative and hypnotic	0 (0)	1 (1)
Anticonvulsant	53 (39)	59 (47)
Opioid	41 (30)	39 (31)
Skeletal muscle relaxant	12 (9)	5 (4)
Anticholinergic medications	11 (8)	12 (10)
Insulin	19 (14)	16 (13)
Sulfonylurea	6 (4)	8 (6)
Blood Pressure Reported at Time of Fall, mean (mmHg)*	133/76	132/76
Systolic Blood Pressure < 110 mmHg, n (%)*	5 (29)	5 (22)
Systolic Blood Pressure >160 mmHg, n (%)*	3 (18)	4 (17)

†Data expressed as median (range)

\*Out of the 17 patients in the control group and 23 patients in the intervention group that had BP taken at the time of fall

Figure 1: Injurious Fall Outcomes

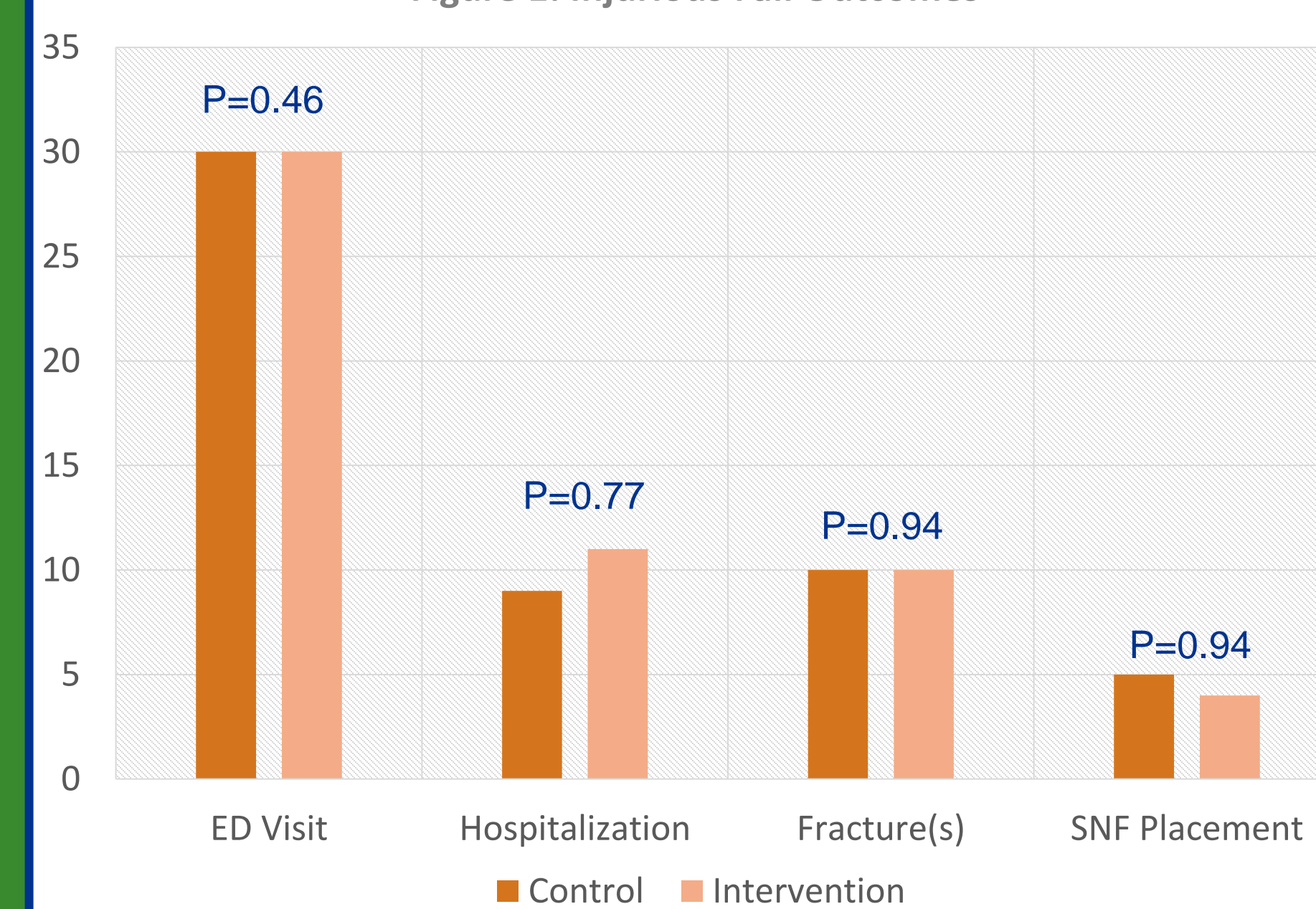


Figure 2: Pharmacist Medication Recommendations

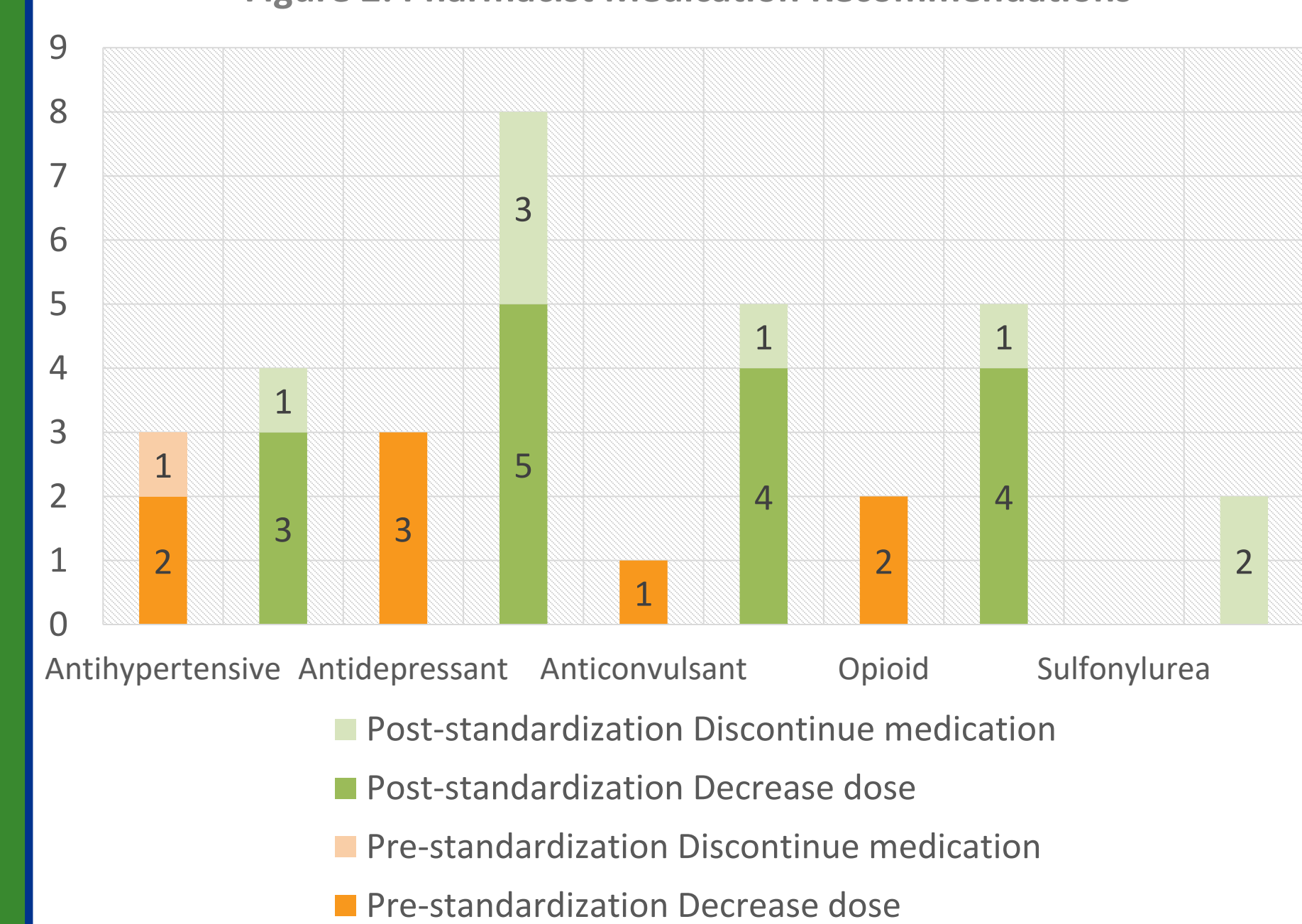
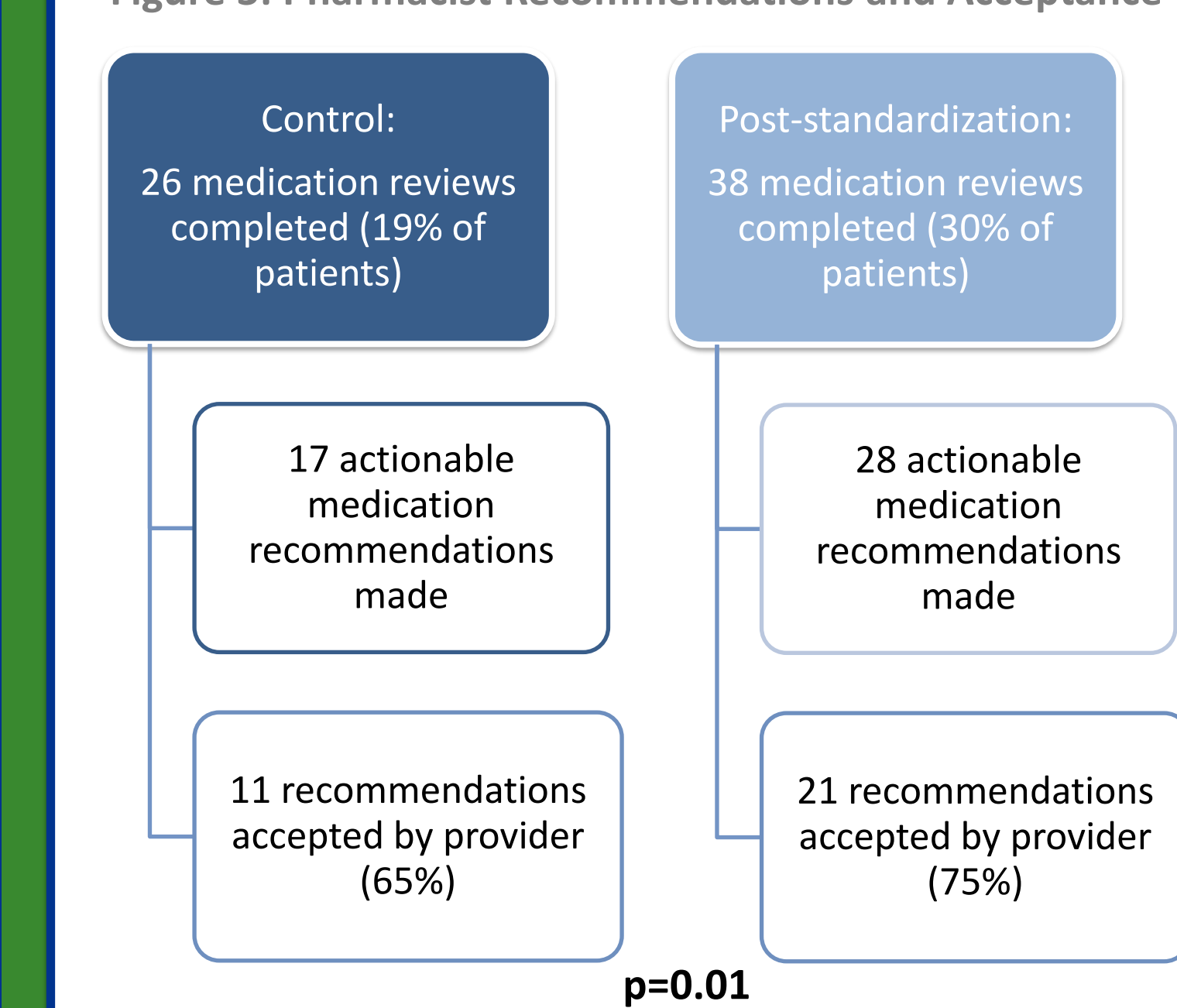


Table 2: Total Number of Subsequent Falls

	Control Group (n=135)	Post-Standardization group (n=126)
Number of patients with a subsequent fall, n (%)	106 (78.5%)	93 (73.8%)
Total number of injurious subsequent falls	39	41
ED Visits	30	30
Hospitalizations	9	11
Total number of subsequent falls	534	391
Average number of subsequent falls	5.0	4.2

Figure 3: Pharmacist Recommendations and Acceptance



## Results

### Primary Outcome (Figure 1)

- There were 41 total ED visits and hospitalizations among the intervention group between the 126 participants (32.5%) compared to 39 between the 135 participants in the control group (28.8%). This was not statistically significant.

### Secondary Outcomes

- Total falls:** There were more subsequent falls after the index fall in the control group than the intervention group (Table 2). Of those who fell, there were a combined total of 534 subsequent falls in the control group and 391 in the intervention group, an average of 5 vs. 4.2 subsequent falls per person, p=0.07.
- Medication reviews completed:** Post-standardized medication review process, pharmacists did complete more total medication reviews (38, 30% of initial falls reviewed) than prior to the implementation (26, 19% reviewed). Post-implementation, more recommendations were made regarding high-risk classes, such as anti-depressants, opioids, and sulfonylureas (Figure 2).
- Recommendations Accepted:** Of the reviews completed, there were significantly more med recommendations made and subsequently accepted by the provider post implementation, p=0.01 (Figure 3).

## Discussion

- Despite the extended timeframe from the index fall event, there remained no statistically significant difference in the number of subsequent injurious falls between the pre- or post-standardization group.
- However, It may be challenging to truly see the effect pharmacist involvement has on care, as pharmacists were still involved with control group's overall care regardless of whether the patient was officially reviewed or not due to the ElderPlace model of care.
- However, the increase in number of recommendations being made and accepted by providers following medication review standardization is representative of a beneficial impact on pharmacist workflow.

### Limitations:

- Limited by falls documented in Datix.
- Limited by reports received from caregivers and participants and may be underreported, especially for participants who reside independently.
- The number of recommendations made and accepted is a surrogate outcome.

## Going Forward

- High proportion of Elderplace patients on antihypertensives and anticonvulsants; focus provider education going forward on ensuring appropriate use of these high-risk medications in the elderly.
- Complete a subgroup analysis of baseline characteristics, such as a diagnosis of dementia or a categorization of frailty, to see if these specifically impact fall risk in this population.
- Compare fall rates and pharmacist intervention impact among other PACE programs nationally. Although potentially challenging to acquire accurate data, it would be additionally beneficial to compare PACE program fall rates to community fall rates.

## References

- Dautzenberg L, Beglinger S, Tsokani S, et al. Interventions for preventing falls and fall-related fractures in community-dwelling older adults: A systematic review and network meta-analysis. *J Am Geriatr Soc.* 2021;69(10):2973-2984.
- Jehu DA, Davis JC, Falck RS, et al. Risk factors for recurrent falls in older adults: A systematic review with meta-analysis. *Maturitas.* 2021;144:23-28.
- Houpt C, Kubotera, N. Standardized pharmacist led medication review in patients with recent falls: Poster. 2022.