Association between Home Modifications and Having Fallen in the Past Year Among Adults Ages 65+ that Live in Private Residences, NHATS 2015

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Overview

The purpose of this study is to quantify the association between home modifications and falls amongst older adults living in private residences with recent data.

Background

- One in four Americans aged 65+ falls each year which results in about 30 million falls yearly[1].
- Fall deaths increased by 30% from 2007 to 2016 for older adults in the US. If rates continue to rise in this manner, the CDC anticipates 7 fall deaths every hour by 2030[1].
- Although home modifications are increasingly seen as ways to decrease falls and disability amongst older adults, few studies have analyzed fall data in relation to home modifications[2].

Study Design

- *2015 National Health and Aging Trends Study (NHATS Round 5)*
- **Analytic Sample:** Medicare beneficiaries aged 65+ living in a private residence who had valid data for both having fallen in the past year and for whether or not they had home modifications (n=2,550).
- **Exposure:** We defined home modifications as having one or more of the following: a grab bar in the shower/tub area, a seat for the shower/tub area, a raised toilet or raised toilet seat, and grab bars around the toilet.
- **Outcome:** We defined having fallen in the past year by combining responses to “in the last month have you fallen down” and “in the last 12 months since our last interview have you fallen down.”
- **Covariates:** Fear of falling, balance/coordination impairments, limited lower body strength, uses glasses/contacts, arthritis, bothered by pain in the past month.
- **Analyses:** Logistic regression models were estimated to identify the association between home modifications and falls in 2015. We accounted for weighting and complex survey design by using the NHATS weighting formula.

Demographics

Table 1. Distribution of demographics by home modification status of adults living in private residences: Round 5 NHATS 2015 (N=2,550)

	No Home Modifications (n=2,211)	Has Home Modifications (n=3,450)
Age (Years)		
65-69	52% (380)	41% (380)
70-74	23% (260)	23% (323)
75-79	15% (212)	18% (315)
80-84	6.5% (125)	11% (251)
85-89	2.6% (58)	5.2% (146)
90+	0.91% (27)	2.1% (73)
Gender		
Male	47% (487)	48% (685)
Female	53% (575)	52% (803)
Race		
White, Non-Hispanic	75% (637)	83% (1027)
Black, Non-Hispanic	8.9% (238)	7.4% (289)
Other	5.4% (48)	4% (45)
Hispanic	10% (96)	5.3% (71)
Education		
Did not receive high school diploma	17% (211)	13% (260)
Received high school diploma	23% (256)	25% (382)
Some level of higher education	60% (535)	62% (760)
Has fallen in the past year		
Yes	8.3% (86)	9.4% (146)
No	92% (976)	91% (1342)

Results

- Those with home modifications have the same odds of having fallen (1.00, 95% CI .70, 1.43) as those without home modifications. There is not sufficient statistical evidence of a difference in risk of falling in the past year between those living in private residences with and without home modifications.
- Those who were Black, Non-Hispanic had 0.53 (95% CI 0.34, 0.83) the odds of having fallen as compared to White, Non-Hispanic individuals.
- As level of education increases, the odds of falling seems to increase, but this finding was not statistically significant.

References

1. Bergen G, Stevens M, Burns, E. Falls and Fall Injuries Among Adults Aged ≥65 Years — United States, 2014. CDC Morbidity and Mortality Weekly Report. [Internet] 2016. [cited 2019 Sep. 18] 65:993-998.
2. Medicare Interactive. Home modifications to continue living at home. [Internet] 2019. [cited 2019 Sep. 18]

Results

Table 2. Adjusted Odds Ratios of Having Fallen in the Past Year Among Adults Living in Private Residences: Round 5 NHATS 2015

Characteristics	Adjusted OR (95% CI)
Has Home Modifications	
Yes	1.00 (.70, 1.43)
No	1.00 (ref)
Age (Years)	
65-69	1.00 (ref)
70-74	1.33 (0.87, 2.04)
75-79	0.77 (0.47, 1.28)
80-84	1.24 (0.78, 1.97)
85-90+	1.29 (0.75, 2.24)
Gender	
Male	1.00 (ref)
Female	1.01 (0.74, 1.37)
Race	
White, Non-Hispanic	1.00 (ref)
Black, Non-Hispanic	0.53 (0.34, 0.83)
Other	1.13 (0.65, 1.96)
Education	
Did not receive high school diploma	0.83 (0.50, 1.40)
Received high school diploma	0.96 (0.63, 1.45)
Some level of higher education	1.00 (ref)
Fear of Falling	
Yes	0.84 (0.54, 1.29)
No	1.00 (ref)
Balance/Coordination Impairments	
Yes	4.21 (2.77, 6.41)
No	1.00 (ref)
Limited Lower Body Strength	
Yes	1.40 (0.90, 2.15)
No	1.00 (ref)
Uses Glasses/Contacts	
Yes	0.97 (0.67, 1.41)
No	1.00 (ref)
Arthritis	
Yes	1.49 (0.97, 2.28)
No	1.00 (ref)
Bothered by pain in the past month	
Yes	1.20 (0.82, 1.75)
No	1.00 (ref)

Conclusion

- Overall, we found no statistically significant association between home modifications and falls when adjusting for relevant characteristics. However, the relationship between home modifications and falls is complex. Future studies are needed to prospectively identify the role home modifications might play in decreasing risk of falls.
- Given the cross-sectional nature of the data, we were unable to fully examine the impact of how home modifications might impact falls. Future studies need to examine potential longitudinal relationships between home modifications and falls.
- Potential policy and practical impact: Although we did not find a statistically significant association in the present study, falls remain an important contributor to mortality and poor outcomes in older adults. Therefore, it is imperative to better serve our older population that we continue to study how home modifications can improve those outcomes.

Special thanks to Annie Gjelsvik, PhD and Tamra Keeney, PhD for their support on this project.