Is Fear of Falling the Missing Link to Explain Racial Disparities in Fall Risk? Data from the National Health and Aging Trends Study

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Abstract

Objectives: Emerging research suggests Black older adults experience a 30% decreased risk of falls compared to their White U.S. counterparts, and this is mediated neither by physical performance nor activity. Fear of falling (FOF) is a significant risk factor for falls, yet we know little about how FOF varies by race/ethnicity. The purpose of this original research brief was to investigate the relationship between race/ethnicity and FOF among older adults.

Methods: 4,981 community-dwelling Medicare beneficiaries from the National Health and Aging Trends Study (NHATS) who had not self-reported a fall in the past 12 months were analyzed. Logistic regression analyses were conducted to examine the association between race/ethnicity and fear of falling, controlling for sex, age, total annual income and mobility assistance.

Results: FOF differed significantly across racial groups. Black, non-Hispanic older adults were less likely to have FOF (OR=0.87, 95% CI = 0.71,1.07) compared to their White, non-Hispanic counterparts. In the fully adjusted model, this difference persisted and became stronger (aOR=0.75, 95%CI = 0.61, 0.93).

Conclusion: The decreased risk of falls in Black older adults could be explained by lower FOF in this group.

Clinical Implications: These findings should inform public health fall prevention initiatives among community-dwelling older adults.

Keywords

race; health disparities; older adults; fear of falling; risk factors

Falls are a major public health concern among community-dwelling older adults. In the United States, unintentional falls are the most common cause of nonfatal injuries for people older than 65 years. On average, one in four older adults falls at least once in a given year (Stevens & Phelan, 2012) and half of them fall again during the next year (Tinetti, Speechley, & Ginter, 1988).

Risk factors for falls have been researched extensively. Emerging evidence suggests Black older adults are less likely to experience initial or recurrent falls than non-Hispanic Whites (Nicklett & Taylor, 2014). A recent paper by Sun et al. found that relative to White older adults, Black older adults are at 30% decreased risk of sustaining a fall despite poorer physical performance (Sun, Huang, Varadhan, & Agrawal, 2016). This epidemiologic finding is surprising because Black older adults have more risk factors associated with falls, such as diabetes and stroke (Sattin, et al., 1990).

This paper investigates the relationship between race/ethnicity and an individual's fear of falling (FOF) as a potential explanation for racial disparities in falls. Several studies have shown FOF can increase the risk of falling (Fletcher, 2004; Friedman, Munoz, West, Rubin, & Fried, 2002; Howland, et al., 1993; Scheffer, Schuurmans, Dijk, Hooft, & Rooij, 2008; Tinetti, Leon, Doucette, & Baker, 1994); furthermore, FOF not only develops among those who have previously sustained a fall, but also among those who have not (Arfken, Lach, Birge, & Miller, 1994; Downton & Andrews, 1990; Maki, Holliday, & Topper, 1991). Thus, the purpose of this study is to examine the association between race/ethnicity and fear of falling among community-dwelling Medicare beneficiaries using data from the National Health and Aging Trends Study (NHATS).

Method

Data

Data were obtained from the 2011 NHATS, which is a longitudinal investigation of factors related to functioning in later life. The National Institute on Aging sponsors NHATS (grant number NIA U01AG032947) through a cooperative agreement with the Johns Hopkins Bloomberg School of Public Health (NHATS; www.nhats.org). NHATS oversamples non-Hispanic Black older adults and those aged 90 years and older to ensure sufficient power and precision for analyses. A more comprehensive overview of NHATS study design, purpose and data collection method is reported elsewhere (Freedman, et al., 2011; Kasper & Freedman, 2012).

Sample

During Round 1 of NHATS beginning in 2011, 12,411 individuals were selected and 8,245 were interviewed using a stratified three-stage sample design with a weighted response rate of 71.3% (Howland, et al., 1993; Kasper & Freedman, 2012). Falling was self-reported and defined as "any fall, slip, or trip in which you lose your balance and land on the floor or ground or at a lower level". Respondents who had fallen in the past 12 months (n = 1,550) were excluded from analysis because research has shown any previous fall increases the risk for another fall threefold (Vassallo, Sharma, & Allen, 2002). Thus, individuals who experience recurrent falls represent a distinct clinical population. Among those who reported having sustained a fall in the past 12 months and therefore excluded from analyses, 74.04% were white, 19.59% were black and 6.37% were Hispanic.

Variables

Main Outcome.—FOF was assessed with the question: "In the last month, did you worry about falling" and the possible answers were "Yes", "No", "Do not know" or refused. Those who replied, "Do not know" or refused (n = 1,480) were excluded.

Exposure.—The main exposure variable for this study was race and ethnic group. Race/ethnicity was categorized as Non-Hispanic and White (hereafter "White"), Non-Hispanic and Black (hereafter "Black") and Hispanic. Those who replied, "Do not know", refused or reported their race/ethnicity as "Other" (n = 237) were also excluded.

Confounders.—We controlled for several socio-demographic and medical factors that could confound the association between race/ethnicity and FOF. These included sex, age (Stevens, 2005), total annual income (Kumar, Carpenter, Morris, Iliffe, & Kendrick, 2014), and mobility assistance (Askari, et al., 2013). Age at interview was grouped by decade (65–74, 75–84 and 85+ years). **Previous research has shown lower income to be associated with higher odds of FOF, so we included it in our analysis (Kumar, Carpenter, Morris, Iliffe, & Kendrick, 2014).** Our measure of total annual income used reported income data when available and imputed income data when missing and was categorized based on Sun et al.'s paper (Sun, Huang, Varadhan, & Agrawal, 2016). The need for mobility assistance was assessed with the question: "In the last year, did you ever get help with getting out of bed, getting around your home/building, or leaving your home/ building?" Those who refused to answer the question, who answered they did not know, or for whom this question was inapplicable (n = 1,968) were excluded.

The final analytic sample consisted of community-dwelling Medicare beneficiaries who had not fallen in the past 12 months and who had valid information for the study outcome, exposure, and confounders (n=4,981).

Analyses

Statistical analyses were performed using STATA version 14.1. Weighted measurements were used to account for complex survey design and to adjust for non-response and non-coverage. Cross-tabulation and bivariate analyses of the outcome variable and the potential confounding variables by the exposure variable were performed. Next, bivariate logistic

regressions were estimated to determine the unadjusted relationship between race/ethnicity and FOF. Lastly, multivariate logistic regression analyses were performed to examine FOF by race/ethnicity groups while adjusting for known confounding variables, as described above.

Results

Table 1 presents weighted descriptive statistics and comparisons between race/ethnicity and socio-demographic characteristics of NHATS respondents who have not fallen in the past 12 months. FOF differed significantly across racial groups. Black older adults were the least likely to have FOF (16.98%) and Hispanic older adults were the most likely (24.13%). Income also differed between the racial/ethnic groups: 30.90% of Whites reported they had an annual income of greater than $60,000 compared to 11.45% of Black and 9.20% of Hispanic respondents; similarly, fewer Whites (18.97%) reported they had an annual income of less than $15,000 compared to Black (42.83%) and Hispanic (47.60%) older adults. There were no statistically significant differences between groups in needing mobility assistance.

Table 2 presents results from the unadjusted and adjusted logistic regression models. Black older adults were less likely to have FOF (OR=0.87, 95%CI = 0.71, 1.07) compared to Whites. In the adjusted model, this difference persisted and became stronger (aOR=0.75, 95%CI = 0.61, 0.93). Among confounders, income was negatively associated with FOF, with those earning $60,000 or more being the least fearful (aOR = 0.75, 95% CI = 0.57, 0.98). Age was also positively associated with FOF, with the oldest respondents (85–90+ years) being the most afraid (aOR=2.36, 95% CI = 1.88, 2.25). Women were more likely to have FOF compared to men (aOR = 1.98, 95% CI =1.63, 2.34). Additionally, older adults who required mobility assistance were more likely to have FOF compared to those who did not (aOR=1.81, 95% CI = 1.10, 2.94).

Discussion

In this nationally representative sample of Medicare beneficiaries, decreased FOF in Black older adults could help explain why they sustain fewer falls compared to Whites. The results of this study are consistent with those of Sun et al., who found that Black older adults had a 30% decreased risk of sustaining a fall and a 40% decreased risk of sustaining recurrent falls (Sun, Huang, Varadhan, & Agrawal, 2016). Another study in Northern California found that Black and Asian older women (between the ages of 65–90) were significantly less likely than White women to have fallen in the past 12 months (Geng, Lo, Brickner, & Gordon, 2017). Therefore, this study bridges the knowledge gap about racial disparities in FOF and confirms known socio-demographic characteristics associated with increased FOF, including older age, being female (Stevens, 2005), having a lower income (Kumar, Carpenter, Morris, Iliffe, & Kendrick, 2014), as well as needing mobility assistance (Askari, et al., 2013).

One strength of this study includes using a large, nationally representative sample, which allows for national estimates among these racial and ethnic subgroups. Another stength is the similarity between the falls-related questions between NHATS and the American Geriatrics Society/British Geriatrics Society (AGS/BGS) clinical guidelines for falls

prevention (Kenny et al., 2011), recommendations by the Centers for Disease Control and Prevention (Stevens & Phelan, 2012), and those mandated by the Center for Medicare and Medicaid Services (Shubert, Smith, Prizer, & Ory, 2013).

Despite contributing to the understanding of an unexplained finding, this study has a few limitations. First, it relied on cross-sectional data from NHATS Round 1, which limits the ability to draw conclusions about temporal associations. Exploring the association between FOF and falls across racial/ethnic groups over time represents an important next step in understanding racial disparities in fall risks. Second, multiple interacting factors influence falls and several additional confounders such as prescription medications and environmental hazards were not accounted for in NHATS (Tinetti, Leon, Doucette, & Baker, 1994).

Moreover, NHATS lacks a detailed assessment of FOF and, as such, it captures neither fall-related self-efficacy specifically, nor the gradient of intensity for FOF. **Widely used scales such as the Falls Efficacy Scale (FES) or the shorter FES-I scales have excellent reliability and construct validity and could be considered in future research addressing this question (Kempen, et al., 2007).** NHATS also relies on self-reported falls and research has shown that older adults often have difficulties in accurately recalling the occurrence of falls, especially non-injurious ones (Ganz, Higashi, & Rubenstein, 2005; Hale, Delaney, & Cable, 1993; Peel, 200). Therefore, these data are inherently susceptible to recall or reporting bias that could under- or overestimate the occurrence of falls (Hauer, Lamb, Jorstad, Todd, & Becker, 2006).

As the U.S. population continues to age and more people become at risk for falls, a greater understanding of disparities is crucial for targeted prevention efforts. This study analyzed race/ethnicity-based differences in FOF among a nationally representative sample of Medicare beneficiaries and found that Black older adults were notably less likely to be fearful of falling compared to White older adults. This could help explain Sun et al.'s finding of Black older adults having a 30% decreased risk of sustaining falls.

Future studies should incorporate a more detailed assessment of FOF and race/ethnicity (e.g. Black-Hispanics), account for climate and public infrastructure, and integrate psychological components into multifactorial fall prevention programs. **More research is also needed to understand why Black older adults have decreased FOF, despite having lower total annual income, which is associated with increased FOF.** Given that the likelihood of sustaining fewer falls is mediated by neither physical activity nor physical performance among Black older adults, future studies are needed to establish what factors are responsible for this decreased risk along with psychological components such as FOF.

Acknowledgments

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Clinical Implications

- Given FOF is increasingly recognized as a risk factor for falls, more intervention studies targeting FOF prevention are needed among community-dwelling older adults in the U.S.

- In view of the findings of this study, clinicians should consider adopting a more individualized screening assessment for community-dwelling older adults who are at an increased risk for falls.

Table 1:

Descriptive Characteristics of Community-Dwelling Medicare Beneficiaries Who Had Not Fallen in the Last Year, by Race/Ethnicity Status (n=4,981)

	White, non-Hispanic 84.03% (3471) n (Weighted %)	Black, non-Hispanic 8.99% (1204) n (Weighted %)	Hispanic 6.98% (306) n (Weighted %)	P value [a] Pearson χ2
Fear of Falling				
No	81.07% (2713)	83.02% (991)	75.87% (224)	<0.001
Yes	18.93% (758)	16.98% (213)	24.13% (82)	
Sex				
Male	45.62% (1527)	42.18% (493)	49.74% (145)	0.067
Female	54.38% (1944)	57.82% (711)	50.26% (161)	
Age				
65–74 years	54.94% (1405)	59.17% (554)	56.60% (130)	0.001
75–84 years	33.34% (1382)	30.93% (472)	32.72% (119)	
85+ years	11.73%(684)	9.90% (178)	10.67% (57)	
Total Annual Income [b]				
Less than $15,000	18.97% (740)	42.83% (547)	47.60% (157)	<0.001
$15,000 to $30,000	21.15% (813)	22.32% (272)	23.20% (72)	
$30,000 to $60,000	28.99% (986)	28.99% (261)	19.87% (52)	
More than $60,000	30.90% (932)	11.45% (124)	9.20% (25)	
Mobility Assistance [c, d]				
Not Required	90.40% (3067)	84.50% (978)	89.09% (228)	0.685
Required	2.75% (98)	3.10% (37)	8.11% (8)	

[a] Pearson χ2 between White, non-Hispanic and Black, non-Hispanic and Hispanic.

[b] Income imputed using published criteria by Marker, Judkins, & Winglee, 2002.

[c] Received help with getting out of bed, getting around home/building, or leaving home/leaving your building in the last year.

[d] Missing data for 565 respondents.

Table 2.

Unadjusted and Adjusted Odds Ratios of Worry about Falling among White non-Hispanic, Black non-Hispanic and Hispanic Older Adults Who Have Not Fallen in the Past 12 Months

Characteristics	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Race/Ethnicity		
White, non-Hispanic	1.00 (reference)	1.00 (reference)
Black, non-Hispanic	0.87 (0.71, 1.07)	0.75 (0.61, 0.93)
Hispanic	1.36 (1.04, 1.77)	1.16 (0.85, 1.60)
Female	2.18 (1.87, 2.54)	1.98 (1.63, 2.34)
Age		
65–74 years	1.00 (reference)	1.00 (reference)
75–84 years	2.03 (1.72, 2.39)	1.89 (1.58, 2.23)
85+ years	2.94 (2.51, 3.46)	2.36 (1.88, 2.25)
Annual Income [a]		
Less than $15,000	1.00 (reference)	1.00 (reference)
$15,000 to $30,000	0.80 (0.67, 0.96)	0.82 (0.67, 1.00)
$30,000 to $60,000	0.58 (0.46, 0.74)	0.77 (0.59, 0.99)
More than $60,000	0.47 (0.37, 0.59)	0.75 (0.57, 0.98)
Need for Mobility Assistance [b]	1.83 (1.12, 2.97)	1.81 (1.10, 2.94)

CI: confidence interval; OR: odds ratio.

[a] Income imputed using published criteria by Marker et al [19].

[b] Received help with getting out of bed, getting around home/building, or leaving home/leaving your building in the last year.