Published in final edited form as:

J Am Geriatr Soc. 2019 January ; 67(1): 100–107. doi:10.1111/jgs.15625.

Rehabilitation Services Use among Older Adults according to Fall-Risk Screening Guidelines

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Abstract

OBJECTIVE: To characterize rehabilitation services use among older adults according to fall-risk classification based on screening guidelines.

DESIGN: Cross-sectional analysis of the 2015 National Health and Aging Trends Study

SETTING: Study participants' homes.

PARTICIPANTS: National sample of 7,440 community-dwelling Medicare beneficiaries.

MEASUREMENTS: In-person interviews and functional assessments (gait speed, balance and strength testing). Based on CDC's STEADI criteria, participants were classified into low, moderate, and high fall-risk.

RESULTS: Among older adults, 23.3% of those classified as moderate fall-risk (n=2602) and 40.6% of those at high fall-risk (n=940), reported rehabilitation services use in the past year. Rehabilitation services use was associated with older age, higher education, non-Hispanic white race/ethnicity, and osteoarthritis in those with high fall-risk. Among older adults who reported rehabilitation services in the past year (n=1,505), treatment to address falls was reported by 2.8%, 12.6%, and 34.7% of those classified with low, moderate, and high fall-risk, respectively (p<0.001). Older adults with high fall-risk who did not receive rehabilitation services had significantly better self-reported physical capacity (p=0.02) but comparable physical performance (gait speed, grip strength, tandem stand, five time sit to stand; all p's >0.05) relative to those who received rehabilitation.

CONCLUSION: Older adults at high risk for falls were significantly more likely to report rehabilitation services use compared to those with low and moderate risk of falling. However, the findings also indicate that there is low adherence to national clinical recommendations for rehabilitation services use in older adults vulnerable to falls-related injury. Among the high fall-

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Author Contributions: NMG conceived, designed, and performed the analyses and drafted the manuscript. KVP conceived, designed and interpreted the analyses and drafted the manuscript.

Conflict of Interest: The authors declare no financial, personal, or potential conflicts of interest.

Sponsor's role: None

risk group, those who did not receive rehabilitation services had similarly low physical function as compared with those who received rehabilitation, indicating potential unmet need to address physical impairments related to fall-risk.

Keywords

Rehabilitation; falls; health services; older adults; geriatrics

INTRODUCTION

Falls are a leading cause of injury, morbidity, and functional impairment among older adults.¹⁻⁴ An estimated 30% of people age 65 and older experience a fall annually with significant public health implications. Over one-third of falls cause injury requiring medical treatment or activity restriction in older adults.¹ In addition, health care costs associated with fatal and non-fatal falls approaches \$50 billion annually.⁵ The substantial impact on quality of life, mortality, and health-related expenditures necessitates proactive implementation of evidence-based, fall-risk reduction strategies in older adults.

Clinical practice guidelines recommend older adults at low and moderate fall-risk participate in community-based exercise and fall prevention programs.^{6,7} For older adults who are unable to participate in community-based exercise programs (e.g., those with severe mobility limitations), rehabilitation services are recommended to address modifiable fall-risk factors and improve ability to participate in community based programs for maintenance. However, little is known about rehabilitation services use among older adults at higher risk for falling (i.e., do those at higher risk receive rehabilitation services as recommended). We recently estimated that 20% of older adults in the U.S. undergo rehabilitation annually (physical therapy, occupational therapy, and speech therapy inclusive) across all clinical settings.⁸ The majority (70%) cite musculoskeletal problems and joint replacement as the primary reason for rehabilitation services use compared to only 14% reporting falls as a primary target for rehabilitation.⁸ A study using Medicare fee-for-service claims data highlights potential underutilization of rehabilitation for older adults vulnerable to recurrent falls and fall-related injuries.⁹ The authors noted a small proportion of older adults who sustained an upper extremity fracture (10.7–18.5%) received fall-risk assessment (evaluation of fall-risk, balance, and gait disorders) or physical therapy treatment for fall-risk or gait issues, despite the fact that falls are the leading cause of fractures. Also of concern are social disparities in rehabilitation services use. For example, Moreland et al. reported that Hispanic and less educated older adults had a lower likelihood of receiving fall-related rehabilitation.¹⁰ To our knowledge, no study has specifically investigated rehabilitation services use among older adults classified according to fall-risk screening criteria.

Identifying patients who are high-risk for falls and targeting appropriate services is a high priority. Accordingly, the Centers for Disease Control and Prevention (CDC) and the American Geriatrics Society (AGS) have published screening guidelines for falls prevention. Among older adults who screen positive for high falls-risk, both guidelines recommend rehabilitation to improve functional mobility, balance, strength and gait training, as well as home safety.^{6,7} However, adherence to these guidelines is uncertain. Therefore, the aims of

this study were to: (1) determine the association of fall-risk level (low, moderate, and high) with rehabilitation services use; (2) characterize rehabilitation services received (e.g. duration of rehabilitation, treatment targets) by older adults at high risk for falls; and (3) determine whether physical function differs between older adults who did and did not receive rehabilitation services use according to falls-risk.

METHODS

We analyzed data from the 2015 wave of the National Health and Aging Trends Study (NHATS). NHATS is a multi-stage, nationally representative sample of Medicare beneficiaries that is used to investigate trends in late-life disability.¹¹ Annual data collection began in 2011 with replenishment of the cohort in 2015 (Round 5). Using an age-stratified, three-stage sample design with the Medicare enrollment file as the sampling frame, there were 8,245 participants recruited in 2011 (Round 1) with a 71% survey response rate. Proxy respondents were used in circumstances when participants could not respond for themselves. In 2015, the sample was replenished resulting in 4,129 (50.1%) new participants in addition to 4,026 from the original sample (74% overall weighted response rate). Only community-dwelling older adults with complete interviews were included in the current analysis resulting in an analytic sample of 7,440. In-person interviews and physical function assessments were conducted in the homes of study participants during a single visit. Written informed consent was obtained from all study participants or their proxy-respondents, and the study protocol was approved by the Johns Hopkins University Institutional Review Board.

Measures

Demographics, Medical Conditions, Sensory and Impairment Symptoms, Fall History—Demographics collected during the interview included age, sex, self-reported race and ethnicity (categorized as white non-Hispanic, black non-Hispanic, Hispanic, and other) and highest education level attained. Participants were asked if a doctor has ever told them that they have certain medical conditions, including: arthritis, osteoporosis, diabetes, heart disease, stroke, cancer, and pulmonary disease. Body mass index (BMI) was calculated from measured height and weight with obesity defined as BMI ≥ 30.0 kg/m². Participants were asked if they experienced bothersome pain in the last month or had balance/coordination problems in the last month. Participants also answered a series of questions about falls and worry about falls, including “In the last 12 months, have you fallen down?” (Yes/No); “In the last 12 months, have you fallen down more than one time?” (Yes/No); and “In the last month, did you worry about falling down?” (Yes/No).

Physical Performance—Physical performance measures included grip strength testing, the Five-Times-Sit-to-Stand Test, usual gait speed, and a multi-stage balance test. The higher value from two trials of grip strength testing with a hand dynamometer (in kilograms) was used for analysis. Usual gait speed was assessed in meters per second over a 3-meter course from a standing start with the higher value of two trials used for analysis. For the Five-Times-Sit-to-Stand Test, participants started in a seated position with arms folded across the chest and were instructed to stand up and sit back down again 5 times as quickly as possible.

The time to complete the test was recorded. For the balance test, participants progressed through a series of balance challenges and instructed to hold each position for 10 seconds. If a participant could not hold a position for 10 seconds in one attempt, they were not asked to perform the more challenging position. The most difficult position held for the specified time was recorded as the final result. Participants progressed from standing with feet side-by-side to semi-tandem, to tandem stand.

Fall-Risk Classification—We adapted criteria from the CDC’s STEADI (Stopping Elderly Accidents, Deaths, and Injuries) algorithm to classify participants into low, moderate, and high fall-risk (see Figure 1).^{6,12} The STEADI algorithm involves a combination of patient-reported information on falls history and performance-based assessment of physical function. Per the STEADI algorithm,⁶ participants are first asked whether they have fallen in the past year, worry about falling, and have problems with their balance. If participants responded no to these questions, then they were classified as low fall-risk. Also in accordance with the STEADI algorithm, participants who reported a fall in the past year, worry about falling, or a balance problem were then evaluated for functional impairments using performance-based testing. Participants who demonstrated no balance or strength impairments (defined further below) were classified as low fall-risk. Among the participants who had an impairment in either balance, chair rise, or gait speed testing, they were classified with moderate fall-risk if they did not report ≥ 2 falls in the past year. The subset of participants who had an impairment on the performance-based tests and who reported ≥ 2 falls in the past year were classified as high fall-risk. Consistent with STEADI, participants who failed to hold a tandem stand for 10 seconds or failed an easier balance test (side-by-side or semi-tandem stands) were considered to have a balance impairment. A cut point of ≥ 12 seconds for completing the Five-Times-Sit-to-Stand Test was used as an indicator of a lower extremity strength or balance impairment.¹³ Finally, gait speed was also used to identify mobility limitation using a cut point of <0.6m/s vs. ≥ 0.6m/sec.¹⁴ Previous work demonstrated that usual gait speed in older adults has comparable screening properties to the Timed-Up-and Go Test¹⁵ that is recommended by STEADI.

Rehabilitation Services Use—Questions on rehabilitation use were asked in 2015 (Round 5). After receiving a description of physical rehabilitation, participants were asked if they had received any “rehab services” in the last year (Yes/No). Among those who responded “yes,” participants were then asked, “which problems were they trying to improve” during rehabilitation with the option to select all that applied from a comprehensive list. The selected targets for rehabilitation included addressing falls, lower extremity strengthening, treatment for balance/coordination, gait training, and transfer training. Additional questions addressed the total time spent in rehabilitation and whether the therapist recommended assistive devices and home modifications to reduce fall-risk. (See Supplementary Text S1 for the NHATS rehabilitation questions used in this study).

Depression and Anxiety—Symptoms of anxiety and depression were assessed using the Patient Health Questionnaire-4 (PHQ-4).^{16,17} Both the anxiety and the depression subscales have a score range of 0–6; a score of 3 or higher has been validated and is considered positive for screening purposes.^{16,17}

Cognitive Status—Cognitive status was classified using the AD8 Dementia Screening questionnaire.¹⁸ Based on a previously established algorithm, participants were classified as having no dementia, possible dementia, and probable dementia.¹⁹

Supplemental Insurance—Participants were asked whether they had supplemental insurance coverage to Medicare, including Medigap and Medicaid.

Physical Capacity—The self-reported measure of physical capacity has previously been validated in older adults.²⁰ An index of physical capacity was computed from six pairs of tasks assessing a range of functional abilities (e.g., ability to walk 3/6 blocks; ability to reaching overhead/place a heavy object overhead). For each pair, if a participant reported that they were able to perform the more challenging task then he/she was not asked about the easier version of the task and were assumed to be able to do it. A composite score was calculated by summing the total number of activities the respondent reported they were able to do (range 0 to 12) with higher values indicating greater physical capacity.

Data Analysis

Analyses were performed with Stata (Version 15.1 Stata Corp., College Station, TX). Analytic weights were used to account for survey non-response and oversampling of the oldest-old and racial/ethnic minorities. Taylor series linearization, incorporating the complex sample design, was used to calculate variance estimates (95% confidence intervals [CI]). We estimated the prevalence of rehabilitation services use according to fall-risk (low, moderate, and high) and participant characteristics for the community-dwelling, older adult population. Within each fall-risk category, we used adjusted Wald statistics to test differences in rehabilitation use by participant characteristics (Table 1). We used multivariable Poisson regression models to examine the association of fall-risk with rehabilitation services use, adjusting for socio-demographics, health conditions, and supplemental insurance (Table 2). To further characterize rehabilitation services use, we calculated the percentage of patients reporting treatment received during rehabilitation that is considered evidence-based for fall-risk reduction (Table 3). Within each fall-risk group, we used linear and Poisson regression to model the association of rehabilitation services use with physical performance measures (tandem stand, gait speed, 5-time sit-to-stand, grip strength) and self-reported physical capacity, adjusting for age and sex (Table 4).

RESULTS

Applying the STEADI algorithm to a representative population of Medicare beneficiaries, 29.9% (n=2,602) and 11.6% (n=940) were classified as moderate and high fall-risk, respectively. Among older adults with moderate and high fall-risk, 23.3% (n=597) and 40.6% (n=372), respectively, reported rehabilitation services use in the past year. As shown in Table 1, among those at high risk, rehabilitation services use was associated with older age, higher education, non-Hispanic white race/ethnicity, a diagnosis of arthritis, and being overweight or obese.

After adjusting for socio-demographics, rehabilitation services use was 70% higher and three times higher for older adults classified as moderate and high risk for falls, respectively,

compared to those at low risk (Model 1; Table 2). In the fully adjusted model, which also included health conditions, symptoms, and sensory impairments, rehabilitation services use remained significantly higher in older adults at moderate risk and high risk of falling compared to those at low risk for falls. In both model 1 and model 2, rehabilitation services use was significantly higher in those at high risk for falls compared to those classified as moderate risk ($P<0.001$).

Among all participants, 2.9% ($n=81$) of those classified as moderate fall-risk and 14.1% ($n=137$) of those at high fall-risk received rehabilitation to address falls in the past year (See Supplementary Figure S1). Table 3 shows that among older adults who received rehabilitation, the prevalence of having falls addressed explicitly during rehabilitation was reported by 12.6% and 34.7% of those with moderate and high fall-risk, respectively. Also shown in Table 3, treatment to address balance was reported by 45% and 57% among those at moderate and high fall-risk, respectively, while 58% of those at moderate risk and 66% of those at high fall-risk worked on strengthening during rehabilitation. Prescription for mobility devices, such as walkers, during rehabilitation was reported by less than half of those at moderate and high fall-risk. In addition, approximately one-third of those at moderate and high fall-risk had rehabilitation treatment that addressed leaving home or stair climbing, while 48% of those at moderate risk and 58% of those at high fall-risk had treatment that targeted walking inside the home.

Among those at moderate fall-risk, physical function was significantly lower in those who received rehabilitation compared to those who did not, adjusting for age and sex (Table 4). Among those at high fall-risk, physical function measures were comparable (i.e., statistically non-significant) between older adults who did and did not receive rehabilitation services in the past year (Table 4). However, self-reported physical capacity was significantly lower in those who received rehabilitation services compared to those who did not (6.7 vs. 5.9, $p=0.02$), adjusting for age and sex.

DISCUSSION

According to the CDC STEADI and AGS/BGS recommendations, older adults who screen positive for high risk of falling should be referred to rehabilitation. Key findings of our study of Medicare beneficiaries in 2015 show that: 1) less than half of older adults at high fall-risk reported rehabilitation services use in the past year, indicating limited adherence to clinical practice guidelines; and 2) among those at high fall-risk who received rehabilitation, just over one-third reported that their treatment addressed falls and approximately half received balance training. While it is reassuring that those at high fall-risk are significantly more likely to receive rehabilitation services compared to older adults at low or moderate risk, the percentage of moderate and high risk older adults who did not have strength, balance, or falls addressed during rehabilitation is a serious concern. Though the original reason for rehabilitation may not have been fall-related, rehabilitation services use for reasons other than a fall should not preclude screening for fall-risk with subsequent referral for treatment of risk factors (e.g., strength and balance deficits) or addressing modifiable risk factors during the current episode of care. Thus, despite public health campaigns promoting falls screening and prevention services, greater efforts are needed for referring older adults at

high fall-risk to rehabilitation services that directly address functional impairments and other risk factors.

In the current study, older adults at high risk of falling who did not receive rehabilitation had significantly higher self-reported physical capacity compared to those who reported rehabilitation services use. In contrast, multiple objective measures of physical performance were comparably low between those who did and did not receive rehabilitation services, underscoring the potential unmet need in this vulnerable population. These findings suggest referral and uptake for rehabilitation services may depend somewhat on the perception of need for services. Importantly, clinicians who rely solely on their patient's report of physical function when screening for fall-risk (i.e., do not use performance-based assessment of physical function) may miss critical opportunities to identify increased fall-risk and subsequent referral to effective interventions. Severe underreporting of fall-related injuries, particularly among non-white and healthier older adults, lends further evidence for including performance-based measures for fall risk screening in clinical practice.²¹ Further research is needed to better understand patient and clinician perceptions of need for rehabilitation services among older adults.

There are several strengths and weaknesses to consider when interpreting the current study results. The cross-sectional design limits any temporal claims between rehabilitation services use and timing of fall occurrence. Although the study participants were asked a range of questions regarding rehabilitation services, participants were not asked about the type of clinician who provided rehabilitation services (physical, occupational, and/or speech language therapists). Additionally, we were not able to discern how many older adults at high fall-risk were participating in community-based fall prevention programs or in exercise programs such as the Otago Program. This results in some limitations in distinguishing the rehabilitation services received and characterizing unmet need. Another limitation is that self-report of falls and rehabilitation services use may result in underestimation. However, Freedman et al. demonstrated similar estimates for rehabilitation services use in the past year comparing self-report to Medicare claims data for the overall NHATS sample,²² which support the validity of self-reported rehabilitation services data. A major strength of this study is that several falls-related questions and a combination of self-reported and performance-based measures of physical functioning were collected in the NHATS, enabling operationalization of the CDC STEADI algorithm in a nationally representative sample of older adults. We acknowledge there are some differences between the physical function measures collected in NHATS and those recommended in the CDC STEADI toolkit, which may result in misclassification of fall-risk. However, Lohman et al. demonstrated the validity of using the NHATS physical performance measures to adapt the STEADI algorithm and predict future falls.²³

Deaths attributable to falls in the US have increased by 31% between 2007 and 2016, and fall-related mortality rates increased the most among the oldest old.²⁴ Improvements in screening and referrals to evidence-based options, including community-based fall prevention programs, exercise and rehabilitation, are a critical component for reducing the alarming upward trend in fall-related mortality.^{25,26} The Medicare sponsored "annual wellness visit" is a primary opportunity to conduct a fall-risk screening. Although the

STEADI toolkit was designed for broad dissemination and implementation by health care providers, the current study findings indicate limited uptake. Improvements in fall-risk screening for older adults may help to mitigate the unmet need in services and identify older adults who could benefit from targeted balance, strength training, functional training, and home assessments for safety.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGEMENTS

The National Health and Aging Trends Study is sponsored by the National Institute on Aging (grant number NIA U01AG32947) and is conducted by the Johns Hopkins University.

Funding Source: The National Health and Aging Trends Study is sponsored by the National Institute on Aging (grant number NIA U01AG32947) and was conducted by the Johns Hopkins University.

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Impact:

We certify that this work is novel. The potential impact of this research on clinical care includes the following: This is the first study to examine rehabilitation services use by fall-risk based on AGS and CDC screening guidelines. The AGS guidelines and CDC's STEADI toolkit, designed for broad dissemination, include rehabilitation recommendations for those at high risk of falling, and yet our findings indicate limited uptake of targeted rehabilitation to address fall-risk in older adults.

Figure 1.
CDC STEADI algorithm adapted for NHATS.

Table 1.

Rehabilitation services use according to participant characteristics and fall-risk among adults age 65 and older.

Risk Classification:	Low N (Weighted %)		Moderate N (Weighted %)		High N (Weighted %)	
Rehabilitation Services Use	No	Yes	No	Yes	No	Yes
Age-years						
65–69	641 (35.7)	92 (35.1)	162 (18.4)	44 (17.3)	70 (26.8)	26 (16.2)
70–74	982 (30.3)	150 (31.4)	332 (21.7)	95 (21.7)	109 (23.5)	74 (27.3)
75–79	764 (17.9)	110 (18.5)	398 (21.0)	111 (18.1)	109 (17.9)	68 (18.5)
80–84	535 (9.5)	68 (8.1)	441 (17.1)	145 (20.3)	109 (14.0)	88 (19.1)
85–89	316 (4.9)	50 (5.0)	381 (13.7)	113 (13.5)	94 (10.6)	54 (9.7)
90	154 (1.8)	24 (1.9)	291 (8.3)	89 (9.1)	77 (7.2)	62 (9.2) *
Sex						
Men	1625 (49.3)	208 (44.6)	712 (38.3)	189 (32.6)	253 (44.8)	150 (43.0)
Women	1767 (50.7)	286 (55.4)	1293 (61.7)	408 (67.4) *	315 (55.2)	222 (57.0)
Race/Ethnicity						
Non-Hispanic White	2250 (79.8)	376 (87.4)	1353 (77.7)	428 (83.7)	379 (79.2)	274 (83.1)
Non-Hispanic Black	754 (8.7)	83 (6.4)	415 (9.2)	110 (7.9)	121 (9.1)	49 (4.6)
Hispanic	192 (7.2)	16 (3.8)	139 (8.8)	25 (5.0)	39 (7.3)	26 (7.7)
Other	109 (4.4)	9 (2.4) **	65 (4.3)	14 (3.4)	17 (4.4)	12 (4.6) **
Education						
Less than high school	277 (6.4)	15 (2.1)	260 (11.8)	50 (7.4)	103 (15.6)	36 (8.8)
9–11 years	324 (7.2)	36 (5.0)	294 (13.2)	71 (10.4)	78 (11.6)	42 (9.7)
High school grad	843 (23.7)	106 (22.0)	574 (29.6)	171 (30.1)	163 (31.8)	94 (27.7)
Some college	920 (30.8)	137 (26.9)	477 (25.8)	141 (25.2)	135 (26.1)	91 (26.0)
College grad	463 (16.0)	87 (20.3)	220 (12.6)	73 (13.5)	48 (8.2)	47 (13.3)
Advanced degree	478 (15.8)	102 (23.7) **	143 (7.1)	70 (13.5) **	32 (6.7)	50 (14.4) **
Has Medicaid	397 (8.5)	33 (4.9) **	326 (14.8)	92 (13.4)	127 (19.4)	78 (21.5)
Has Medicare Supplement	2059 (63.0)	320 (65.9)	1156 (58.7)	374 (63.3)	303 (54.0)	223 (59.8)
Arthritis	1673 (44.8)	326 (62.2) **	1387 (64.5)	445 (72.3) **	429 (74.2)	301 (80.9) *
Heart Disease	630 (16.9)	117 (21.0)	569 (27.4)	215 (35.7) **	194 (33.5)	148 (34.3)
Stroke	99 (3.0)	26 (3.9)	145 (8.4)	77 (11.9)	58 (13.7)	57 (16.6)
Osteoporosis	598 (16.7)	122 (21.4) *	583 (27.3)	211 (32.7)	164 (27.8)	137 (30.9)
Weight status						
Normal	1077 (31.7)	152 (30.2)	633 (29.3)	178 (25.7)	167 (26.7)	115 (27.6)
Underweight	49 (1.6)	7 (1.5)	53 (2.4)	17 (2.6)	12 (1.5)	21 (4.8)
Overweight	1279 (38.8)	197 (41.1)	652 (33.5)	198 (34.5)	177 (30.7)	118 (35.6)
Obese	909 (27.9)	132 (27.2)	587 (34.8)	191 (37.2)	189 (41.2)	109 (32.1) *
Bothersome pain	1365 (40.1)	293 (57.7) **	1262 (64.1)	439 (76.0) **	415 (76.5)	286 (81.5)
Depressive Symptoms	231 (6.1)	35 (6.8)	349 (17.8)	110 (17.6)	169 (29.9)	108 (29.3)
Anxiety Symptoms	155 (4.5)	30 (6.3)	309 (16.7)	89 (14.5)	135 (25.8)	91 (24.9)

Risk Classification:	Low N (Weighted %)		Moderate N (Weighted %)		High N (Weighted %)	
Rehabilitation Services Use	No	Yes	No	Yes	No	Yes
Cognitive Status						
No dementia	2897 (90.2)	443 (92.8)	1451 (76.7)	437 (76.5)	386 (74.2)	247 (70.4)
Possible dementia	307 (6.7)	24 (3.8)	274 (12.1)	74 (11.7)	80 (11.7)	47 (11.3)
Probably dementia	186 (3.1)	27 (3.4)	278 (11.1)	86 (11.7)	102 (14.2)	74 (18.3)

* P value<0.05

** P value<0.01

Table 2.

Association of undergoing rehabilitation in the last year with fall-risk.

	Rehabilitation Services Use in last year		
	n (%)	Model 1 PR (95% CI) *	Model 2 PR (95% CI) **
Low fall-risk	494 (13.5)	1.0	1.0
Moderate fall-risk	597 (23.3)	1.7 (1.5–2.0)	1.5 (1.3–1.7)
High fall-risk	372 (40.6)	3.1 (2.6–3.6) ‡	2.3 (1.9–2.8) ‡

PR=Prevalence Ratio, CI=Confidence Interval

* Model adjusted for age, sex, race/ethnicity, and education

** Model adjusted for age, sex, race/ethnicity, education, arthritis, stroke, bothersome pain, weight status, multimorbidity, medicaid supplement, medigap supplement, depression, anxiety, dementia classification

‡ p<0.001 For rehabilitation services use among those at moderate risk vs. high risk of falling

Table 3.

Characterization of rehabilitation services use stratified by fall-risk among participants who reported rehabilitation services in 2015 (N=1505; total population sample N=7428).

	Low N (%) N=499	Moderate N (%) N=615	High N (%) N=391	P-value
Time in Rehab				0.62
<1 month	122 (24.8)	129 (23.4)	81 (23.4)	
1–3 months	302 (62.5)	354 (57.9)	213 (57.3)	
>3 months	66 (12.7)	108 (18.6)	75 (19.3)	
Reported rehabilitation treatment:				
Address falls	18 (2.8)	81 (12.6)	137 (34.7)	<0.001
Balance/Coordination	79 (13.4)	270 (45.0)	217 (57.2)	<0.001
Strengthening	227 (44.8)	344 (58.1)	242 (65.6)	<0.001
Improve function in legs	101 (18.6)	258 (38.9)	186 (46.8)	<0.001
Functional limitations addressed in rehabilitation:				
Bed transfers	70 (15)	119 (20.4)	101 (26.5)	<0.001
Walking inside home	148 (27.8)	294 (48.4)	221 (57.9)	<0.001
Leaving home	106 (20.0)	172 (28.6)	133 (34.9)	<0.001
Walking outside	217 (42.9)	277 (49.6)	157 (43.2)	0.20
Climbing stairs	146 (28.6)	172 (31.4)	123 (33.6)	0.32
Therapist recommended assistive device in last year:				
Cane/Walker	113 (18.8)	260 (40.6)	193 (48.0)	<0.001
Wheelchair/Scooter	23 (4.3)	88 (11.8)	82 (19.2)	<0.001
Entrance Ramp	8 (1.5)	38 (6.3)	36 (8.2)	<0.001
Stair lift	2 (0.1)	8 (2.0)	6 (1.2)	0.02
Grab bar (shower/tub)	66 (11.4)	176 (26.9)	165 (39.1)	<0.001
Toilet modification (raised, bar)	53 (8.8)	141 (20.5)	108 (25.4)	<0.001

Table 4.

Physical function characteristics according to rehabilitation services use and falls risk.

Physical Function Characteristics	Low Falls Risk		Moderate Falls Risk		High Falls Risk	
	No Rehabilitation Service Use	Yes Rehabilitation Service Use	No Rehabilitation Service Use	Yes Rehabilitation Service Use	No Rehabilitation Service Use	Yes Rehabilitation Service Use
Unable to hold tandem balance for 10 sec, n (%)	928 (20.9)	123 (16.8) *	1384 (64.0)	435 (71.4) *	422 (69.2)	296 (76.3)
Gait speed in m/s, Mean (SE)	0.93 (0.01)	0.95 (0.01)	0.69 (.01)	0.67 (0.01)	0.67 (0.01)	0.64 (0.02)
<0.8 m/s, n (%)	1277 (29.6)	156 (23.5) *	1546 (74.6)	488 (79.3)	457 (77.5)	301 (78.6)
<0.6 m/s, n (%)	584 (11.5)	76 (9.4)	928 (40.3)	327 (48.4) *	321 (52.1)	227 (57.5)
Five-Time-Sit-to-Stand in sec, Mean (SE)	10.8 (0.2)	10.5 (0.2)	13.5 (0.2)	13.7 (0.2) *	14.3 (0.3)	14.3 (0.5)
12 seconds, n (%)	1204 (29.9)	173 (28.8)	1442 (73.7)	473 (81.4) **	434 (78.6)	292 (82.1)
Grip strength, Mean (SE)	29.4 (0.2)	28.1 (0.5) *	24.7 (0.4)	22.5 (0.5) **	25.2 (0.7)	23.1 (0.9)
Self-reported physical capacity, Mean (SE)	10.8 (.04)	10.4 (0.1) **	7.8 (0.1)	6.4 (0.2) **	6.7 (0.2)	5.9 (0.2) *

* P value<0.05 for comparing older adults who use rehabilitation services in the past year versus those who did not, adjusted for age and sex

** P value<0.01 for comparing older adults who use rehabilitation services in the past year versus those who did not, adjusted for age and sex