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Article type : Brief Methodological Report

Racial Differences in Patterns of Use of Rehabilitation Services among Adults 65 and Older

Racial Differences in Use of Rehabilitation

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Funding Sources: National Institute on Aging U01 AG032947. This work was supported in part by a Promotion of Doctoral Studies (PODS) – Level I Scholarship from the Foundation for Physical Therapy.

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Word Counts (abstract=170, main text=2,493), 3 Tables, 1 Supplemental Table

Structured Abstract:

Objective: To examine racial differences in use of rehabilitation services and functional improvement while rehabilitation services were received

Design: Secondary analysis of the 2016 National Health and Aging Trends Study (NHATS)

Setting: Standardized in-person home interviews

Participants: 6,309 community-dwelling Medicare enrollees, 1,276 of whom reported receiving rehabilitation services in the previous 12 months

Measures: Patient-reported use of rehabilitation services, setting (inpatient, outpatient, home-based), reason for use, and perceptions of change in functioning after receiving rehabilitation services

Results: Controlling for gender, dual eligibility for Medicaid, age, number of chronic conditions, functional mobility at the prior round, income, and geographic region, Whites had 1.38 times the odds of receiving rehabilitation in any setting compared to Blacks (95% CI=1.09, 1.75). Among those receiving therapy, Whites were more likely to receive home-based and inpatient rehabilitation services, but there were no racial differences in improvement in function.

Conclusion: Strategies are needed to identify possible barriers to use of rehabilitation services for vulnerable groups of aging individuals who need rehabilitation services, particularly for older African Americans.

Keywords: aging, rehabilitation, disparities

Introduction

Although disability is not universally experienced by older adults, the prevalence of disability is substantial, affecting nearly half of adults ages 65 and older, and increases sharply with age.[1] Nationwide, the prevalence of late-life disability declined in the latter part of the 20th century[2]; however, in recent years, the trend has plateaued and researchers warn of a possible reversal in the near future as the Baby Boom generation continues to age.[3] Racial and ethnic differences in disability prevalence have been widely documented, with higher rates persisting for Blacks than Whites even after controlling for potentially confounding demographic and socioeconomic characteristics.[4-7] Over the past few decades, older Blacks have gained fewer years of active life than older Whites.[8]

Rehabilitation services can assist in improving function and quality of life throughout later life. Rehabilitation specialists play a unique role in prescribing exercise to alleviate pain, improve strength, aerobic conditioning, and movement. A meta-analysis examining the effects of physical activity in older adults found that regular physical activity can prevent and decrease age-related functional decline.[9] Although these findings provide support for the use of rehabilitation in addressing functional impairment and subsequent disability in older individuals, previous research has demonstrated that use of rehabilitation declines with age.[10]

Studies examining predictors of rehabilitation in later life vary with respect to conclusions about racial and other demographic differences. [11-13] For example, one study found that race was not a significant determinant in overall use of physical therapy, but that Blacks were more likely to receive greater amounts.[13] Others have found that Blacks were less likely than Whites to receive outpatient therapy services for musculoskeletal conditions.[10,14] Another study reported that Blacks demonstrated less functional improvement following inpatient rehabilitation for hip fracture, compared to Whites.[15] Although these studies suggest that racial differences exist in both patterns of use of rehabilitation and in outcomes following treatment, most of the research has been conducted in settings with selective patient populations, limiting their generalizability. And few studies have explored the reasons for observed differences, although there is speculation that differences in insurance coverage may

play a role.[12,13] In particular, older Blacks are much more likely than Whites to be dually eligible for Medicaid and much less likely to have private supplemental insurance.[16]

A recent study of the 2015 National Health and Aging Trends Study (NHATS) described the older population's use of rehabilitation services, and found that utilization was 20% lower among Blacks than among Whites.[17] However, further work is necessary to examine how use of rehabilitation and its perceived effectiveness vary by race after adjusting for potential confounders. The primary aim of this study was to examine racial differences in use of rehabilitation services and self-report of functional improvement after rehabilitation services were received by older adults. The secondary aim was to examine racial differences in rehabilitation services by setting in which the services were received, controlling for sociodemographic factors.

Methods

Data Source

Data are from the 2016 round of the NHATS. NHATS began in 2011 with a sample of 8245 Medicare beneficiaries. The Medicare enrollment database was used as the sampling frame to create a nationally representative cohort of persons ages 65 and older in the United States.[18] Information regarding the complex survey sample design can be found at www.nhatsdata.org. In 2015, the cohort was replenished (about half continuing from the initial 2011 sample and half new sample beginning in 2015).[19] The 2016 round included 6,309 completed sample interviews in settings other than nursing homes.

Individuals enrolled in NHATS participate in an annual interview consisting of items that detail physical functioning, the home environment, and social participation, and complete a battery of physical performance measures.[20]

Measures

NHATS sample members reported on their use of rehabilitation services (defined to participants as receiving services that include physical therapy, occupational therapy, and speech therapy) in the past 12 months, setting where the services were received, their

perceptions of improvements while receiving rehabilitation services, and whether their rehabilitation goals were met. Reasons for use of rehabilitation services were also collected.

Primary race was assessed with a question "What race {do you/does the sampled person} consider {yourself/himself/herself} to be: White, Black or African American, American Indian, Alaska Native, Asian, Native Hawaiian, Pacific Islander, or something else?" Individuals who endorsed more than one group were asked to report the primary race. Individuals were also asked if they considered themselves to be Hispanic or Latino.

A number of control variables previously shown to predict rehabilitation use were also included in analyses: gender[12], dual eligibility[11], age[13], number of chronic conditions[13], income[13], region[12,13], access to transportation, living situation, and functional mobility prior to rehabilitation . Gender was characterized as male vs. female. Dual-eligibility for Medicaid was dichotomized as 'yes' or 'no'. Age was included as a categorical variable: '65 to 74', '75 to 84', and '85 and older'. To classify co-morbidity, a count of the number of chronic conditions (heart attack, heart disease, hypertension, arthritis, osteoporosis, diabetes, lung disease, stroke, dementia or Alzheimer's, and cancer) was used, classified as: none, 1 to 3, 4 or more, and missing. Income was calculated at the 25th, 50th, and 75th percentiles by using a self-report income variable. For cases with missing income, we used an imputed income variable provided by NHATS[21]. In NHATS, U.S. census division is provided. Because of small sample sizes, we recoded division into four regions: Northeast, Midwest, South, and West. Transportation access was self-reported by participants. Individuals who had transportation either drove independently, received a ride from family or friends, used public transportation, or had a ride otherwise provided (shuttle service, car service, etc.). Based on a household roster, participants were classified as either living alone or with others. Functional mobility was calculated using the Short Physical Performance Battery (SPPB) from the 2015 round.[22] SPPB functional scores were categorized into "low" (<6 points), "intermediate" (7 to 9 points), and "high" (10-12 points).[23]

This analysis received exempt status from the Boston Medical Center Institutional Review Board.

Analysis

For all analyses, analytic weights were used to account for the complex survey design of NHATS. Results are therefore generalizable to the community dwelling US population ages 65 and older in 2016.[18] Descriptive statistics were calculated for the entire older population in 2016 and the subset of those who received rehabilitation services in the prior year. Because of limited sample sizes for Hispanic and other groups, we focused this analysis to two groups: subjects who were non-Hispanic White (N=4357) and non-Hispanic Black (N=1284).

All statistical analyses were performed using SAS software, version 9.3.

Racial Differences in Rehabilitation Service Use by Setting and Perceived Improvement

We calculated overall and by racial group the frequency of use of any rehabilitation during the previous 12 months as well as use by setting (inpatient, outpatient, and use of home-based rehabilitation services) among those receiving rehabilitation. Rao Scott Chi-Square tests were used to determine significant differences in use by racial group, rehabilitation use by setting, overall self-report of improvement from rehabilitation, self-report of improvement from rehabilitation by reason for rehabilitation, and whether goals for rehabilitation services were met.

Racial Differences in Rehabilitation Use by Setting

We estimated logistic regression models to identify racial differences in use of rehabilitation services controlling for other predictors of rehabilitation use overall and by setting. Race was the primary predictor of interest, and in all analyses we controlled for variables previously shown to have an impact on use of rehabilitation.

Results

Descriptive Findings

A significantly higher proportion of Whites reported using rehabilitation services than Blacks (21.5% vs. 16.3%; see Table 1). Significant differences were observed for outpatient

services (Blacks 9.9% vs. Whites 15.3%). Among those using rehabilitation in the last year, Blacks disproportionately used home-based services.

Significant differences were found between Blacks and Whites with respect to gender, education, age, region, income, supplemental insurance coverage, dual-eligibility for Medicaid, having transportation, living alone, and functional mobility. Whites had a much lower rate of dual-eligibility than Blacks (6.4% vs. 30.8%), and had a higher rate of enrollment in supplemental insurance coverage (70.6% vs. 48.9%). Half of blacks were in the lowest functional category at 50.7% (vs. 32.4% of Whites).

Among those who received rehabilitation, significant differences were observed between Blacks and Whites in education, region, income, supplemental insurance coverage, dual-eligibility, having transportation, and functional mobility. Almost half (46.8%) of Blacks who received rehabilitation resided in the South, and 36% of Blacks had incomes of less than $17,962. Fewer Blacks were covered under Medicare supplemental insurance when compared to Whites (62.6% vs. 74%), and a larger proportion of Blacks were dually eligible for Medicaid (29.4% vs. 7.7%). A larger proportion of Blacks compared to Whites who received rehabilitation were in the lowest functional category in the prior year (49.2% vs. 29.6%).

Significant differences in the characteristics of those using rehabilitation services were found by race and setting (Table 2). Blacks who received rehabilitation in these settings had higher proportions of having less than high school education, were in the lowest income quartile, and had higher rates of being dual-eligible for Medicaid. For those who received rehabilitation in outpatient and home-based settings, Whites had significantly higher rates of having supplemental insurance (78.7% and 66.3%, respectively). In inpatient and outpatient settings, significant differences were found in functional mobility between Blacks and Whites, with a higher proportion of Blacks in the lowest functional category (66.8% and 47.9%).

Multivariate Results

In fully controlled models, Whites had 1.38 times greater odds of receiving rehabilitation in any setting compared to Blacks (see Table 3). Having fewer chronic conditions and lower levels of education led to decreased odds of receiving rehabilitation. Being in the highest

income quartiles and having Medicare supplemental insurance increased the odds of using rehabilitation. Access to transportation was associated with decreased odds of using rehabilitation, while having the lowest level of function was associated with increased odds of having rehabilitation.

After controlling for covariates, Whites had 1.53 times the odds of using home based rehabilitation and 1.63 times the odds of using inpatient rehabilitation compared with Blacks, but no significant differences were observed in use of outpatient rehabilitation. Predictors of rehabilitation use varied by setting. Individuals who were White, with more chronic conditions, higher incomes, and lower functional mobility status were more likely than others to use home-based services. Whites, those with more chronic conditions, and those in the lowest functional mobility category were more likely to receive inpatient rehabilitation. Those who were male, had fewer chronic conditions, and lower levels of education were less likely to receive outpatient rehabilitation whereas those in the youngest age category, with the highest income and Medicare supplemental insurance were more likely to do so. Having transportation was associated with lower odds of home-based and inpatient use, but higher odds of outpatient service use.

No significant racial differences were found with reference to overall improvement in function or goals met by rehabilitation services (Supplemental Table S1). A majority of Blacks and Whites reported overall improvement (61.9% and 64.4%) and meeting goals (53.8% and 57.2%). Around one third of the sample reported no change from rehabilitation received (32.0% Whites; 35.9% Blacks)

Discussion

Older Black Americans do not use rehabilitation services at the same rates as Whites, and this finding holds after controlling for socioeconomic, demographic, and functioning-related characteristics. Whites are more likely to be served in outpatient settings than Blacks, but differences are fully accounted for in multivariate models. In contrast, there are no racial differences in (unadjusted) home-based and inpatient use, but once differences between Blacks and Whites are accounted for, Whites have higher rates of use in both of these settings. Finally,

we found no racial differences in perceptions about rehabilitation effectiveness, although a substantial minority of the sample reported no improvement in function.

A higher proportion of older Blacks were low functioning and had lower odds of receiving rehabilitation, suggesting that increased use of rehabilitation services by older Black Americans has the potential to improve late-life functioning in this population. Future work is needed to sort out the contribution of rehabilitation to differentials in functional decline and resultant disability prevalence at the population level and to quantify the likely effects on population-level disparities of equalizing access.

The drivers that influenced use of rehabilitation services varied by setting. Having access to transportation was associated with higher odds of use of outpatient services, but was associated with lower odds of use of inpatient and home services. This finding may demonstrate the influence of transportation in rehabilitation referral patterns for older adults, as providers may be more likely to refer to inpatient or home services for those who are unable to drive or lack reliable transit options. Inpatient rehabilitation services are usually covered by a combination of Medicare and Medicaid by patient diagnosis, while outpatient rehabilitation usually involves a co-pay for treatment and services rendered. These differences in payment mechanism and added costs may be contributing to the differences in use of rehabilitation by income level and for those with Medicare supplemental insurance.

Low functional mobility in the prior year was a significant contributor to the use of any, home-based, and inpatient rehabilitation. Individuals in the lowest functional mobility category had marked impairments in balance, lower extremity strength, and gait speed. These functional limitations can lead to decreased ability to participate in community based activities and therefore may limit ability to participate in rehabilitation outside of the home or inpatient setting.

Limitations

In this data set, individuals reported use of rehabilitation services in the last 12 months. The timing of events that increase the need for rehabilitation (for example, a stroke, injurious fall, or surgery) were not available in the survey. Although we controlled for functional

mobility in the prior year, we were unable to control further for the severity of specific conditions. As a result differences between Blacks and Whites may not be fully captured. Regional differences were characterized broadly, which may have dampened further regional disparities in use of rehabilitation. This study drew upon self-report measures of use of rehabilitation services and subjective assessments of improvement in function, which could have measurement properties that systematically vary by race that are not captured by the socioeconomic and demographic factors in our models. We were also unable to explore differences for physical, occupational, and speech therapies because participants were not asked to distinguish types of rehabilitation services used.

Conclusions

This study has revealed racial differences in the overall use of rehabilitation services in community-dwelling individuals 65 years of age and older. In this nationally representative sample, we found that that despite differences in patterns of use, Blacks and Whites reported equivalent overall improvement in function after completing rehabilitation. This study is the first of its kind to establish that the predictors driving the use of rehabilitation services vary by the setting in which rehabilitation is received. Further study is needed to develop strategies aimed at identifying possible barriers to use of rehabilitation services for vulnerable groups of aging individuals, particularly for those who are Black, dual eligible, of the oldest age groups and lowest functioning.

Acknowledgements

Conflict of Interest: Dr. Freedman and Dr. Jette are investigators with the National Health and Aging Trends Study (NHATS). Dr. Cabral and Dr. Keeney have no conflicts of interest to declare.

Author Contributions: Dr. Jette and Dr. Keeney contributed to study concept and design. Dr. Keeney, Dr. Cabral, and Dr. Freedman contributed to statistical analysis and interpretation of data. All authors contributed to the preparation of the manuscript.

Sponsor's Role: None.

References

1. Freedman V, Spillman B. Disability and care needs among older Americans. *The Milbank Quarterly*. 2014;92(3):509-541.

2. Freedman V, Spillman B, Andreski P, et al. Trends in late-life activity limitations in the united states: An update from five national surveys. *Demography*. 2013;50(2):661-671.

3. Schoeni R, Freedman V, Martin L. Why is late-life disability declining? *Milbank Quarterly*. 2008;86:47-89.

4. Lin S, Beck A, Finch B. Black-white disparity in disability among U.S. older adults: Age, period, and cohort trends. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. 2014;69(5):784-797.

5. Fuller-Thomson E, Nuru-Jeter A, Minkler M, Guralnik J. Black-white disparities in disability among older americans: Further untangling the role of race and socioeconomic status. *Journal of Aging Health*. 2009;21(5):677-698.

6. Brand D, Alston R, Harley D. Disability and race: A comparative analysis of physical activity patterns and health status. *Disability & Rehabilitation*. 2012;34(10):795-801.

7. Ciol M, Shumway-Cook A, Hoffman J, Yorkston K, Dudgeon B, Chan L. Minority disparities in disability between Medicare beneficiaries. *Journal of the American Geriatric Society*. 2008;56(3):444-453.

8. Freedman V, Spillman B. Active life expectancy in the older US population, 1982-2011: Differences between blacks and whites persisted. *Health Affairs*. 2016;35(8):1351-1358.

9. Tak E, Kuiper R, Chorus A, Hopman-Rock M. Prevention of onset and progression of basic ADL disability by physical activity in community dwelling older-adults. *Ageing Research Reviews*. 2013;12:329-338.

10. Carter S, Rizzo J. Use of outpatient physical therapy services by people with musculoskeletal conditions. *Physical Therapy Journal*. 2007;87:497-512.

11. Elrod C, DeJong G. Determinants of utilization of physical rehabilitation services for persons with chronic and disabling conditions: An exploratory study. *Archives of Physical Medicine and Rehabilitation*. 2008;89:114-120.

12. Machlin S, Chevan J, Yu W, Zodet M. Determinants of utilization and expenditures for episodes of ambulatory physical therapy among adults. *Physical Therapy Journal*. 2011;91:1018-1029.

13. Freburger J, Holmes G. Physical therapy use by community-based older people. *Physical Therapy Journal*. 2005;85:19-33.

14. Sandstrom R, Bruns A. Disparities in access to outpatient rehabilitation therapy for African Americans with arthritis. *Journal of Racial and Ethnic Disparities*. 2016;online.

15. Graham J, Chang P, Berges I, Granger C, Ottenbacher K. Race/ethnicity and outcomes following inpatient rehabilitation for hip fracture. *Journals of Gerontology, Series A: Biological Sciences and Medical Sciences*. 2008;63(8):860-866.

16. Fields C, Cubanski J, Boccuti C, Neuman T. Profile of Medicare beneficiaries by race and ethnicity: A chartpack. 2016;Report #8847.

17. Gell N, Mroz T, Patel K. Rehabilitation services use and patient reported outcomes among older adults in the united states. *Archives of Physical Medicine and Rehabilitation*. 2017;online, ahead of print.

18. Montaquila J, Freedman V, Edwards B, Kasper J. National health and aging trends study round 1 sample design and selection. NHATS technical paper #1. 2012.

19. DeMatteis J, Freedman V, Kasper J. National health and aging trends study round 5 sample design and selection. NHATS technical paper #16. 2016.

20. Kasper J, Freedman V. National health and aging trends study user guide: Rounds 1, 2, 3, 4, & 5 beta release. 2016.

21. DeMatteis J, Freedman V, Kasper J. National health and aging trends study round 5 income imputation. NHATS technical paper #15. 2016.

22. Kasper J, Freedman V, Niefeld M. Construction of performance-based summary measure of physical capacity in the national health and aging trends study. NHATS Technical Paper #4. 2012.

23. Guralnik J, Ferrucci L, Simonsick E, Salive M, Wallace R. Lower-extremity function in persons over the age of 70 years as a predictor of subsequent disability. *The New England Journal of Medicine*. 1995(332):556-561.

Supplemental Table S1. Reports of Improvement in Functioning During Rehabilitation

Table 1. Rehabilitation Use and Sociodemographic Characteristics Among All Adults Ages 65 and Older and Those Receiving Rehabilitation Services in the Last Year

	All Older Adults			Among Older Adults Receiving Rehabilitation		
	All	White	Black	All	White	Black
Used Rehabilitation in Past 12 Months*						
Yes	20.2	21.5	16.3			
Rehabilitation Use by Setting						
Inpatient	6.4	6.6	6.0	31.6	30.9	36.9
Home-based†	7.2	7.2	7.1	35.5	33.7	44.1
*Outpatient**	13.9	15.3	9.9	68.8	71.3	61.4
Gender*						
Female	55.4	55.6	60.2	60.5	61.6	63.6
Education*†						
Less than High School	16.4	11.1	30.6	13.1	10.5	21.8
High School	27.6	26.9	26.6	25.0	23.3	28.1
Some College or Greater	56.0	56.2	42.8	61.9	66.2	50.0
Age*						
65 to 74	52.9	51.8	54.1	48.2	48.3	50.6
75 to 84	33.4	34.2	34.0	34.5	34.3	36.5
85+	13.7	14.0	11.9	17.3	17.4	12.9
Region*†						
Northeast	18.4	18.8	14.4	21.1	21.3	19.6
Midwest	22.0	24.7	20.1	21.1	22.2	24.1
South	37.8	35.8	58.1	35.5	35.3	46.8
West	21.7	20.7	7.3	22.3	21.2	9.4
Income*†						
< $17,962	21.0	14.7	42.3	17.6	13.7	36.0
$17,962 to $34,955	23.7	22.8	28.8	23.3	22.8	30.5
$34,956 to $64,939	25.6	28.2	16.9	27.0	28.7	18.0
$64,939 or greater	29.8	34.3	12.1	32.1	34.9	15.5
Medicare Supplemental Insurance*†						
Yes	65.9	70.6	48.9	71.6	74.0	62.6

Dual-Eligible for Medicaid*†						
Yes	12.8	6.4	30.8	12.1	7.7	29.4
Has Transportation*†						
Yes	79.7	85.2	63.5	74.4	78.6	59.8
Lives Alone*						
Yes	29.7	30.1	35.7	31.3	32.0	38.8
Short Physical Performance Battery Score*†						
Low (<6 points)	36.0	32.4	50.7	46.1	29.6	49.2
Intermediate (7 to 9 points)	37.6	38.3	38.4	32.1	39.9	39.0
High (10-12 points)	26.4	29.3	10.9	21.8	30.5	11.8
n	6309	4357	1284	1276	953	209

* indicates $p < 0.05$ for Black/White comparisons amongst All Older Adults

† indicates $p < 0.05$ for Black/White comparisons amongst Older Adults Receiving Rehabilitation

Table 2. Sociodemographic Characteristics of the 65 and Older Population Among Those Using Rehabilitation Services in the Last Year by Type of Service and Race

	Inpatient Rehabilitation		Home-Based Rehabilitation		Outpatient Rehabilitation	
	White	Black	White	Black	White	Black
Gender						
Female	61.2	60.1	57.2	64.2	62.2	62.1
Education*†º						
Less than High School	15.8	24.6	15.5	25.2	6.8	15.5
High School	27.7	38.8	28.0	33.2	21.1	26.7
Some College or Greater	56.5	36.6	56.5	41.6	72.1	57.8
Age						
65 to 74	37.2	42.7	35.2	41.7	56.4	52.9
75 to 84	40.1	39.9	36.0	36.3	33.0	41.0
85+	22.7	17.4	28.8	22.0	10.6	6.1
Region†						
Northeast	19.5	18.9	23.9	12.9	20.6	19.6
Midwest	21.7	25.5	18.3	27.7	23.0	25.4
South	39.8	47.3	41.9	48.2	33.0	46.4
West	19.1	8.3	16.0	11.2	23.4	8.6
Income*†º						
< $17,962	22.2	35.6	19.5	39.3	8.8	29.2
$17,962 to $34,955	28.1	33.7	24.6	34.1	21.6	33.7
$34,956 to $64,939	22.5	21.1	33.0	11.4	27.8	20.3
$64,939 or greater	27.2	9.6	22.9	15.1	41.8	17.8
Medicare Supplemental Insurance†º						
Yes	68.6	48.7	66.3	55.2	78.7	63.1
Dual-Eligible for Medicaid*†º						
Yes	11.8	30.5	12.8	33.6	3.5	23.2
Has Transportation*†						
Yes	65.3	49.2	57.2	43.8	90.3	78.5

Lives Alone†						
Yes	35.9	25.2	33.9	31.9	28.7	46.4
Short Physical Performance Battery Score*†						
Low (<6 points)	58.4	66.8	61.9	75.3	33.5	47.9
Intermediate (7 to 9 points)	31.6	32.6	27.6	22.3	34.1	41.4
High (10-12 points)	10.0	0.6	10.5	2.4	32.4	10.7
n	317	85	360	109	621	114

* indicates p <0.05 for Black/White comparisons for Inpatient Rehabilitation; † indicates p <0.05 for Black/White comparisons for Outpatient Rehabilitation; º indicates p <0.05 for Black/White comparisons for Home-Based Rehabilitation

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Table 3. Predictors of Use of Rehabilitation Services

	Use of Any Rehabilitation		Use of Inpatient Rehabilitation		Use of Home Based Rehabilitation		Use of Outpatient Rehabilitation	
	OR	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*
Race (*White*)	*1.38**	1.09, 1.75	*1.63**	1.11, 2.39	*1.53**	1.09, 2.16	1.13	0.79, 1.61
Gender (*Male)*	*0.80**	0.66, 0.95	1.05	0.80, 1.39	1.29	0.96, 1.74	*0.69**	0.56, 0.84
Dual Eligibility *(Yes)*	1.05	0.79, 1.39	1.17	0.71, 1.91	1.37	0.98, 1.93	0.82	0.55, 1.22
Age								
65 to 74 vs. 85+	1.00	0.77, 1.30	0.95	0.62, 1.46	0.74	0.49, 1.11	*1.41**	1.03, 1.92
75 to 84 vs. 85+	0.95	0.76, 1.19	1.10	0.78, 1.54	0.77	0.54, 1.09	1.29	0.96, 1.72
Chronic Conditions								
0 vs. 4+	*0.24**	0.16, 0.37	*0.13**	0.06, 0.31	*0.17**	0.07, 0.39	*0.33**	0.20, 0.56
1-3 vs. 4+	*0.54**	0.45, 0.64	*0.56**	0.43, 0.73	*0.42**	0.32, 0.55	*0.72**	0.56, 0.93
Income (*< 25th percentile*)								
25th percentile	1.34	0.95, 1.80	1.14	0.73, 1.79	1.28	0.85, 1.92	1.44	0.97, 2.14
50th percentile	*1.52**	1.07, 2.15	0.98	0.61, 1.57	*1.92**	1.33, 2.77	1.44	0.90, 2.30
75th percentile	*1.68**	1.22, 2.33	1.23	0.76, 1.98	1.43	0.94, 2.16	*1.84**	1.21, 2.80
Education (Some College or Greater)								
Less than High school	*0.72**	0.54, 0.96	0.87	0.57, 1.34	0.78	0.53, 1.14	*0.60**	0.42, 0.85

High school	*0.72**	0.58, 0.88	0.91	0.67, 1.22	0.86	0.65, 1.14	*0.69**	0.55, 0.87
Medigap Supplemental (Yes)	*1.37**	1.14, 1.64	1.09	0.85, 1.40	1.05	0.84, 1.31	*1.55**	1.21, 1.99
Region (West)								
Northeast	1.18	0.85, 1.64	1.00	0.66, 1.53	1.50	0.91, 2.46	1.09	0.72, 1.63
Midwest	0.90	0.68, 1.20	0.98	0.63, 1.54	1.06	0.69, 1.61	0.84	0.60, 1.19
South	0.94	0.74, 1.20	1.13	0.73, 1.74	1.52	0.99, 2.33	0.79	0.60, 1.04
Has Transportation	*0.69**	0.56, 0.85	*0.51**	0.38, 0.69	*0.34**	0.25, 0.47	*1.68**	1.29, 2.20
Lives Alone	1.11	0.94, 1.32	1.07	0.84, 1.37	1.01	0.78, 1.31	1.08	0.87, 1.35
SPPB Score								
Low vs. High	*1.50**	1.16, 1.95	*3.63**	2.14, 6.13	*2.95**	1.77, 4.90	1.27	0.96, 1.70
Intermediate vs. High	0.99	0.76, 1.29	*2.19**	1.26, 3.79	1.61	0.99, 2.62	0.87	0.65, 1.17

* indicates p-value <0.05

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