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Lower Extremity Physical Performance, Self-Reported Mobility Difficulty and Use of Compensatory Strategies for Mobility by Elderly Women

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Abstract

Objective—To describe the relationship between lower extremity physical performance, self-reported mobility difficulty and self-reported use of compensatory strategies for mobility inside the home.

Design—Cross sectional, exploratory study.

Setting—Community-dwelling elders.

Participants—Disabled, cognitively-intact women ≥ 65 years old ($n=1002$), from the Women's Health and Aging Study I.

Interventions—N/A

Main Outcome Measures—Compensatory strategy (CS) scale: No CS, Behavioral Modifications (BM) only, Durable Medical Equipment (DME) with or without use of behavioral modifications, and any use of Human Help (HH); and 3 dichotomous CS measures: Any CS (vs none); DME $\pm$ HH (vs BM only, among users of any CS); Any HH (vs DME only, among users of any DME/HH).

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Results—Self reported mobility difficulty and physical performance were significantly correlated with one another ($r=-0.57$, $p<0.0001$) and with the CS Scale ($r=0.51$, $p<0.001$ and $r=-0.54$, $p<0.0001$ respectively). Sequential logistic regressions showed self reported difficulty and physical performance were significant independent predictors of each category of CS. For the Any CS and DME±HH models, the Odds Ratio (OR) for self reported difficulty decreased by ~50% when physical performance was included in the model, compared to difficulty alone (18.0 to 8.6 and 7.3 to 3.8 respectively), but both physical performance and difficulty remained significant predictors ($p<0.0001$). The effects of covariates differed for the various CS categories, with some covariates having independent relationships to compensatory strategy, and others appearing to have moderating or mediating effects on the relationship of self reported difficulty or physical performance to CS.

Conclusions—Physical performance, self reported difficulty, health conditions, and contextual factors have complex effects on the way elders carry out mobility inside the home.

Keywords

Rehabilitation; Geriatrics; Walking; Self-Help Devices

Acute and chronic illness commonly affects the abilities needed for self-care activities and full participation in society. In 2001, 27% of older Americans in the community reported limitations in daily activities, and 23% reported limitations in walking¹. Rates of disability have steadily declined over the last two decades. Increasing usage of assistive technology may account for as much as half of the decline in the number of people dependent on human help². Further reductions might be achieved if we knew more about why people with physical limitations use assistive technology or other methods to help with performance of activities of daily life.

Compensatory strategies used for the performance of daily activities vary, and can be thought of as ranging from behavioral modifications affecting the way the activity is performed (e.g., walking less often), to use of durable medical equipment such as a walker or wheelchair, to use of human help. Baltes and Baltes³ distinguished among strategies that relied on *selection* (restriction of involvement in activities), versus *optimization* (augmentation of one's reserves through activities such as exercise), versus *compensation* (use of new means such as assistive technology or behavior modification to meet personal goals). Using this categorization scheme, Gignac and colleagues⁴ found that use of different compensatory strategies was associated with specific demographic and psychological characteristics and that subjective perceptions of dependence and helplessness differed according to the type of compensatory strategy⁵. Historically, use of human help has been considered to represent more severe disability than use of assistive technology⁶; however, a study found worse physical performance among people who relied on assistive technology alone compared to those using human help⁷. Another study found that persons relying on assistance from either equipment and/or human help were less likely to report pain and fatigue than those who used no assistance; yet among the assistance users, persons who relied only on equipment were more likely to report pain and fatigue than those who reported using some human help⁸. On the other hand, longitudinal controlled analyses by Taylor and Hoenig⁹ showed that persons relying on human help for mobility had substantively higher medical costs and greater health care utilization as opposed to those who relied primarily on equipment for mobility. Clearly further study is needed to understand the factors that influence use of one type of compensatory strategy versus another.

An important consideration in studying compensatory strategies is that the effectiveness of specific compensatory strategies likely is influenced by contextual factors such as social

support and the built environment. For example, among wheelchair users, lack of home accommodations that allow for wheelchair use was associated with use of more hours of human help¹⁰. Also, not all assistive devices are equally efficacious. One study showed that mobility equipment users who reported mobility difficulty despite their mobility aids subsequently experienced more days in bed and used more hours of personal assistance¹¹. Last, but not least, thresholds for reporting difficulty with tasks may be affected by contextual factors such as culture, age and income¹². Unfortunately, there are virtually no studies that address how physical abilities interface with perceptions of mobility difficulty and with contextual factors to affect ways that people carry out mobility tasks¹³. Inconsistency in the ways that disability is measured and defined further complicates studies of mobility disability¹⁴. Several studies show that self-report and performance-based measures have but a moderate correlation with one another^{15,16,17}. Neither self-reported difficulty nor timed performance of standardized tasks measure how tasks are carried out at home, in the context of daily life.

This study used the constructs put forth in the World Health Organization (WHO) International Classification of Functioning, Disability, and Health (ICFDH) to systematically examine factors that may influence how individuals in a community dwelling population carry out mobility activities inside the home. The first goal of this study was to simply describe the relationship between self-reported mobility difficulty and lower extremity physical performance and use of particular compensatory strategies for mobility in the home. Next, we investigated if mobility difficulty and lower extremity physical performance interacted with health, social and environmental characteristics to influence compensatory strategy use. Our study seeks to address a gap in the literature, to further clarify the means through which physical abilities relate to perceptions of mobility difficulty and contextual factors in use of compensatory strategies for in home mobility. Its purpose is to provide information which can be used to generate hypotheses for further work.

METHODS

Study Design—This was a cross-sectional study using baseline data from the Women's Health and Aging Study (WHAS) I.

Patient Sample and Setting—Methods used in the WHAS I have been described in detail elsewhere^{7,18}. To summarize, WHAS is a longitudinal, prospective cohort study which includes an age-stratified random sample from the Medicare enrollment file for all female beneficiaries of the United States health care program for elders (i.e., Medicare) in 12 contiguous ZIP code areas in the Baltimore, Maryland area, resulting in a socioeconomically and ethnically diverse group. Based on eligibility criteria of self-reported difficulty in two or more domains of physical function and self-care, the WHAS I study recruited 1,002 women aged 65 or older. The women included in WHAS I represented the one-third most disabled older women living in the community without severe cognitive impairment at baseline (Mini-Mental State Examination score >17)¹⁹. All variable information originated from the WHAS I database.

Conceptual Framework—The World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICFDH) guided our analyses²⁰. The ICFDH identifies health factors and organ system impairment as important determinants of activity and participation; it also identifies various personal and environmental factors as contextual factors that can influence activity and participation (for example: ICFDHe310 “immediate family”, ICFDHe298 “human-made changes to environment”). Therefore, covariates representing *health conditions* and both *personal* and *environmental* contextual

factors were included in the models if there was reason to believe they might have an effect on use of compensatory strategies for mobility, independent of the effects of either mobility difficulty or lower extremity physical performance. The relatively small sample size limited the number of covariates used in the models, therefore variables were included only if literature review and clinical consensus indicated a variable might influence use of compensatory strategies for mobility independent of either physical performance or mobility difficulty.

Measurements

Dependent Variable—In the original questionnaire, women reported whether they used walls or furniture for mobility when walking inside the home, which we defined as behavioral strategies. In addition, women reported whether they used mobility aids such as a cane, walker or wheelchair (which we classified as equipment). Women also reported if they held on to another person while walking at home (use of human help with a wheelchair was not reported). From these data, we derived a four-level, ordinal scale to classify the compensatory strategies women reported using for mobility inside the home. The compensatory strategy scale was based on those commonly used in rehabilitation, which typically are anchored by human help at one end and complete independence at the other end. The most commonly used example of this type of scale, the Functional Independence Measure²⁰, assigns use of behavioral modifications and durable medical equipment as an intermediate level between dependency on human help and complete independence. In addition, we empirically tested various potential classifications schemes, and selected the scale that showed the best Likert scalability of all potential classification schemes.⁷ Based on this information, the compensatory strategy scale for mobility in the home was (1) no compensatory strategy used, (2) behavioral modifications only, (3) use of equipment with or without behavioral modifications, and without use of human help, and (4) any human help regardless of whether any other compensatory strategies were utilized.

In addition, we created 3 dichotomous variables for the various compensatory strategies, based on clinical pertinence, and defined to ensure orthogonality (independence) to one another, allowing examination of the effects of predictors first on use of any compensatory strategy (any vs. none), then on the type of compensatory strategy (behavior vs. equipment or human help) among those using some compensatory strategy, and finally on use of equipment and human help (equipment only vs any human help) among those using equipment and/or human help. It was these dichotomous variables that were used as the dependent variable in models describing compensatory strategies for mobility.

Independent Variables

Lower Extremity Physical Performance: The Short Physical Performance Battery (SPPB) was used to measure lower extremity physical performance. The SPPB is a well-validated measure that summarizes the results of three measures of lower extremity physical performance (gait speed, chair stands, and balance) carried out in a standardized way. Participants performed the maneuvers in their homes under the instruction of data collectors, with scoring specified according to the WHAS I data collection manual. Gait speed was measured using the best of two timed 3 or 4 meter walks; chair stand time was measured using the time needed to rise five times from a seated position in a chair without using the arms; and balance was measured according to achievement on increasingly difficult balance tests (from standing with feet side by side for 10 seconds to tandem stance for 10 seconds). Persons were allowed to use mobility aids (i.e., cane, walker) during the gait speed test, but not for the chair stand or balance test. Each of these tests is in turn scored on a range of 0–4 (subjects who were unable to complete the task for any reason were assigned a score of 0), thus allowing the results of the individual measures to be added together to create a

summative scale, with scores ranging from 0 to 12, with higher scores indicating better performance.^{7,17}

Self Reported Mobility Difficulty: Difficulty with mobility was self-reported as no difficulty, some difficulty, or a lot of difficulty walking across a small room. Subjects who reported that they did not walk were considered to have a lot of mobility difficulty.

Covariates: Covariates were selected for inclusion to represent health conditions and personal and environmental contextual factors that might influence use of a compensatory strategy for mobility independent of lower extremity physical performance and/or self-reported mobility difficulty, based on the WHO ICFDH²⁰ and review of the literature. The final number of covariates included was limited based on sample size. Simple correlational analyses of the covariates demonstrated at most small associations between physical performance and each of the covariates ($r \leq |0.21|$) and at most moderate associations between pairings of the covariates ($r \leq |0.47|$).

The health conditions included in the study were depression (Geriatric Depression Scale score ≥ 10 vs. <10), visual impairment (self-report that a physician had told them they had a “vision problem”), dizziness/light-headedness on standing, and chest pain or shortness of breath when walking down a flight of stairs. Personal contextual factors considered were race (white vs. all others), education ($<$ high school vs. all others), social support (lives alone, married living with one person, married living with more than one person, unmarried living with one or more persons), income (in thousands of dollars), missing data on income, receipt of Medicaid, and self-report of a visit with a physical therapist or home health nurse in the prior 6 months. Environmental barriers in the home were measured by response to two questions: presence or absence of a step to go into the home and whether the bedroom, bathroom, and kitchen were on the same floor, summarized as presence of any barrier (an entryway step or multilevel living area) versus no barrier.

Statistical Analysis—All computer analyses were performed using SAS version 9.1 for Windows (SAS Institute, Inc., Cary, NC).

Descriptive analyses were conducted to find the proportions of the sample reporting various levels of mobility difficulty. Spearman correlation coefficients were used to determine correlations between mobility difficulty, physical performance, and the compensatory strategy scale. Logistic regression models were conducted to give insight into the factors that influence use of increasingly more supportive compensatory strategies. The logistic regressions were carried out sequentially, both according to the 3 dichotomous outcome variables described previously which classified progressively more dependent groups of women, and according the sequence in which variables were included in the models. For all 3 dichotomous outcome measures, sequential logistic regression were carried out with the following variables in the model (1) mobility difficulty or physical performance alone; (2) both mobility difficulty and physical performance; (3) mobility difficulty, physical performance, and other health, social, and environmental characteristics. This approach allowed assessment of the strength of the relationship of mobility difficulty and physical performance to compensatory strategy use individually, and in association with one another, and it allowed determination of the unique contribution of each of the covariates, relative to the contribution of mobility difficulty and/or physical performance, to predicting use of a given type of compensatory strategy.

IRB/Human Subjects—All the institutional review boards for involved institutions approved the original study. All subjects gave informed consent.

RESULTS

Out of those reporting mobility difficulty, the proportion was greatest in the group using equipment, then in the human help group, followed by those using behavioral modifications only, and finally, by those reporting no compensatory strategy use (47.3%, 39.3%, 14.2%, and 2.1% respectively). There was a moderate correlation between mobility difficulty and physical performance ($r = -0.54$, $p < 0.0001$). Both mobility difficulty and physical performance showed moderate correlation with the compensatory strategy scale (mobility difficulty $r = 0.51$, $p < 0.0001$, physical performance $r = -0.57$, $p < 0.0001$), indicating that as mobility difficulty increased or physical performance worsened, women generally reported using more dependent compensatory strategies for mobility inside the home.

Tables 3 and 4 show the sequential logistic regressions for the 3 compensatory strategies used. Both mobility difficulty and physical performance were statistically significant independent predictors of all types of compensatory strategy used. However, for the Any Compensatory Strategy model the odds ratio for mobility difficulty was over 50% smaller than when difficulty was modeled alone (8.6 and 18.0 respectively). On the other hand, when mobility difficulty was added into the physical performance alone model, the odds ratios for physical performance changed very little (0.79 and 0.72 respectively). Thus, the relationship of mobility difficulty to use of any compensatory strategies appears to be partially related to the effects of lower extremity physical performance. We found a similar pattern in the models predicting use of behavioral strategies alone versus durable medical equipment and/or human help. Physical performance therefore meets the criteria proposed by Wang et al¹³ for a mediating factor. That is, some of the effect of mobility difficulty on use of compensatory strategies, and on use of behavioral strategies, is *mediated* by lower extremity physical performance. However, both mobility difficulty and physical performance also appear to have *direct* effects on use of any compensatory strategy and on use of behavioral strategies.

With regards to the various contextual and health factors examined in our analyses, Table 4 provides the exact data and Figure 1 depicts the potential pathways for their effects based on our analyses. Some factors appeared to be mediated through effects on physical performance, for example the relationship of vision to use of any compensatory strategy. Other factors appear to have effects independent of mobility difficulty or physical performance, such as the relationship of depression and dizziness to use of any compensatory strategy. Finally, some factors were significant in models that include both mobility difficulty and physical performance, but were not in those with only one of those variables, implying that these factors have independent effects on compensatory strategy use that become apparent only after accounting for the influence of both mobility difficulty and physical performance. For example, education and environmental barriers in the models for any compensatory strategy were not significant in the model that included mobility difficulty only, but they were significant in the physical performance only model and in the model that included both mobility difficulty and lower extremity physical performance. This is consistent with a *moderating* effect¹³, wherein presence of environmental barriers influences the likelihood that mobility difficulty will determine use of any compensatory strategy, but with that effect becoming apparent only after accounting for the dominant direct effects of physical abilities.

DISCUSSION

The most noteworthy finding in this study is that the relationship of difficulty with mobility to use of compensatory strategies for mobility inside the home is only partially related to lower extremity physical performance. In fact, almost half of the effect of mobility difficulty

on use of compensatory strategies appears to be independent of the influence of lower extremity physical performance per se. Other studies have shown a moderate correlation between self reported difficulty and compensatory strategy, self reported difficulty and physical performance, and physical performance and compensatory strategy^{22, 23}, as did we. Recent studies have shown that combined use of self-reported and physical performance measures can help to distinguish important subtypes of disability with unique patterns of prevalence, incidence, and predictors that can identify older persons with particularly elevated or decreased mortality risks^{24, 25}. Ours is the first study to examine the inter-relationship between these three distinct constructs. Self-reported mobility difficulty appears to capture important factors influencing mobility above and beyond the lower extremity physical abilities that clinicians typically consider. Thus, it is vital that screening measures for impaired mobility not rely solely on measures such as gait speed, but also include task-specific questions on difficulty.

The independent relationships of mobility difficulty and physical performance with compensatory strategy use seen in our results make sense clinically. For example, conditions like cardiopulmonary dysfunction might cause mobility difficulty and the need to use some compensatory strategy for mobility such as walking more slowly or avoiding stairs, without affecting the measures of lower extremity physical performance in the SPPB (e.g., gait speed over a short distance, balance). Poor balance, affecting physical performance on the SPPB, might warrant use of a night light, railings, or occasional use of a cane, potentially with such success that unsteadiness doesn't cause mobility difficulty; hence both mobility difficulty and physical performance show independent relationships with the various the compensatory strategies. This also is consistent with the moderate correlations we found between mobility difficulty and physical performance, and for both of these with the compensatory strategy scale.

This study also identified diverse ways in which health factors and contextual factors appear to influence day-to-day mobility methods. The effect of some variables appeared to be mediated through physical performance. For example, vision impairment was an independent predictor in the model predicting use of behavioral strategies only (vs durable medical equipment and/or human help) when mobility difficulty was in the model, but not when physical performance was in the model. Vision was not a significant predictor in any of the other logistic regression models. Thus, vision impairment appears to be an important factor in determining use of behavioral strategies for mobility in the home, and its influence appears to be mediated through its effects on physical performance. Older persons often have partial loss of vision and may have less access to training in cane techniques for the visually impaired or more difficulty learning such techniques, and primarily rely on avoidance of certain activities or use of walls and furniture inside the home.

Contextual factors appeared to have effects on compensatory strategy use that were independent of either mobility difficulty or physical performance. For example, being married was associated with greater odds of using human help, independent of mobility difficulty or physical performance. Although being married has been shown to predict a variety of better health outcomes²⁶, the influence of the spouse on how daily tasks are carried out may primarily relate to simple availability. The relationship of some contextual factors appeared to be particularly complex (e.g., environmental barriers in the home), becoming significant in models that include both difficulty and physical performance, but not in models including only one of those variables. For example, presence of stairs might cause someone to be more likely to experience difficulty with mobility in the home, and the relationship of mobility difficulty to whether or not compensatory strategy is routinely used would be most apparent after accounting for the general influence of lower extremity

physical abilities on which type of compensatory strategy is used (e.g., a cane for painful arthritis versus a walker for more severe balance problems).

Some of the complexity influencing use of compensatory strategies is self-apparent, and this study provides only a broad overview of potentially influential factors and relationships. For example, some environmental characteristics may be experienced as barriers only when physical performance declines (a cane may be needed to climb steps in the presence of leg weakness, but the cane is needed in the home for someone with leg weakness only if there are stairs), and some types of environmental barriers may reduce the effectiveness of certain compensatory strategies (for example, stairs and narrow doorways may preclude use of a wheeled mobility aid) and result in a need for other compensatory strategies (e.g., human help).¹⁰ The cross-sectional nature of this study does not enable definitively sorting out such complex inter-relationships, and it is important to see these analyses as hypothesis generating. The results from this study are best used to help direct future research endeavors in potentially productive directions.

Study Limitations

This is a cross sectional study, and therefore cannot be used to establish causality. The use of multiple regression equations increases the risk of Type I statistical error (presence of a statistically significance when there is not a true relationship). For these reasons, the analyses reported in this study should be considered exploratory. The relatively small sample size limited our ability to include every possible factor that might influence choice of compensatory strategy, so we focused on those variables we had reason to believe would have the strongest influence.

We did not compare the frequencies of covariates between groups prior to including the covariates in the models as we believed that the covariates were clinically relevant and that it was important to include them whatever an initial statistical assay would reveal. The methodological decision to include clinically relevant covariates regardless of obvious association to the outcomes investigated provides some protection against unmeasured confounding affecting the results of models.²⁷ We believe we were also able to avoid overfitting of models by performing some initial correlational analysis (see Methods). However, given our choice to avoid covariate frequency comparison by outcome group, we are unable to demonstrate to readers whether our sample contained significant differences in covariate frequency between compensatory strategy groups, and also whether presence of a covariate was low, high or intermediate within various groups. This limits our ability to clearly determine the likely clinical importance of covariates that have a statistically significant relationship to particular adaptive strategy choice groups, as our analysis cannot determine whether factors which show a statistically significant relationship with particular adaptive strategies are or are not highly prevalent across groups, or within certain groups.

There may well be other factors that affect day to day mobility performance not considered in this study. The database did not allow us to distinguish women who used a wheelchair independently from those who needed human help to propel the wheelchair; however it is likely that women who needed human help to propel the wheelchair also needed help with transfers and would have reported holding on to another person for mobility in the home and have been classified as using human help for mobility. Mobility equipment could be used in the gait speed test that comprised one of the three tests included in the SPPB measure of lower extremity impairment, and thus the measure of lower extremity impairment may not be entirely independent of the compensatory strategy outcome measure. However, supplemental analyses (available on request) showed similar relationships to use of compensatory strategy for each of the component measures in the SPPB.⁷

CONCLUSIONS

In our analysis both self reported mobility difficulty and lower extremity physical performance had statistically significant and substantive relationships to use of specific types of compensatory strategies for mobility inside the home. While a sizeable portion of the relationship of mobility difficulty to compensatory strategy use appears to be due to the underlying mobility skills, about half the effect appears to be due to factors other than lower extremity physical performance per se. Both patients' perceived mobility difficulty and their physical performance should be considered in choosing compensatory strategies for mobility.

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List of Abbreviations

CS	Compensatory Strategy
BM	Behavioral Modifications
DME	Durable Medical Equipment
HH	Human Help
WHO	World Health Organization
ICFDH	International Classification of Functioning, Disability and Health
WHAS	Women's Health and Aging Study
SPPB	Short Physical Performance Battery
IRB	Institutional Review Board

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Figure 1.

Hypothetical relationships between variables based on results of the Univariate and Multivariate Logistic Regression Models.

Footnote: A. Any vs. No Compensatory Strategy; B. Behavior Only vs. Equipment and/or Human Help; C. Equipment Only vs. Any Human Help. Directionality of arrows indicates probable direction of causal relationship between factor(s) or between a given factor and mobility methods. A dotted arrow pointing another arrow indicates a mediator action on the relationship indicated by the second arrow.

Table 1

Descriptive table of all subjects, co-variables and outcome, total n=1002

	n (%) ¹
Difficult home mobility, number of missing = 1	
No Difficulty	718 (71.7)
Some Difficulty	222 (22.2)
A lot of Difficulty	61 (6.1)
LE Physical Performance, number of missing = 0	5.9±3.3
Mean±standard deviation	
Dizzy, number of missing = 7	386 (38.5)
Medicaid, number of missing = 4	204 (20.4)
Education: Not HS graduate, number of missing = 4	645 (64.4)
Cardiopulmonary impairment, number of missing = 0	164 (16.4)
Depression, number of missing = 1	317 (31.6)
Home health RN or PT visit, number of missing = 0	226 (22.6)
Vision impairment, number of missing = 0	829 (82.7)
Low income ² , number of missing = 141	578 (57.7)
Income missing, number of missing = 0	141 (14.1)
Race, White, number of missing = 0	713 (71.2)
Marriage and living situation, number of missing = 6	
Married, lives alone	480 (47.9)
Not married, does not live alone	310 (30.1)
Married, lives with 1 person	155 (15.5)
Married, lives with >1 person	51 (5.1)
Environmental barriers in the home, number of missing = 0	823 (82.1)
Compensatory strategy for mobility, number of missing = 2	
No modification	292 (29.1)
Behavioral modifications only	330 (32.9)
Durable medical equipment ± behavioral modifications	256 (25.5)
Any human help	122 (12.2)

¹ Including missing;² Less than \$15,000 per year;

Table 2

Description of self-reported difficulty, lower extremity physical performance, and compensatory strategy for mobility, n=1002

	No modification n (%)^I	Behavioral modification only n (%)	DME ± Behavioral modification n (%)	Any human help n (%)
Difficult home mobility, number of missing = 3				
No Difficulty	284 (28.3)	282 (28.1)	86 (8.6)	64 (6.4)
Some Difficulty	6 (0.60)	47 (4.7)	121 (12.1)	48 (4.8)
A lot of Difficulty	1 (0.10)	1 (0.10)	49 (4.9)	10 (1.0)
Physical Performance, number of missing = 2				
Median, interquartile range	8, 4–10	7, 4–9	3, 1–5	4, 2–6
	Total	Total	Total	Total
	292 (29.1)	330 (32.9)	256 (25.5)	122 (12.2)

^I Includes missing

Table 3

Logistic regression models including only mobility difficulty and/or mobility performance

Model	Any Compensatory Strategy¹	Equipment or Human Help²	Any Human Help³
	<i>Odds Ratio (95% CI)⁴</i>	<i>Odds Ratio (95% CI)</i>	<i>Odds Ratio (95% CI)</i>
<i><u>Mobility Difficulty only</u></i>			
Difficult mobility	18.0 (8.9, 36.6) ***	7.3 (5.1, 10.3) ***	0.53 (0.38, 0.73) ***
<i><u>LE Physical Performance only</u></i>			
Better LE Physical Performance	0.72 (0.68, 0.76) ***	0.67 (0.63, 0.72) ***	1.2 (1.1, 1.3) ***
<i><u>Both Difficulty & Physical Performance</u></i>			
Difficult mobility	8.6 (4.1, 17.8) ***	3.8 (2.6, 5.6) ***	0.65 (0.44, 0.95) *
Better LE Physical Performance	0.79 (0.74, 0.84) ***	0.75 (0.70, 0.81) ***	1.1 (1.0, 1.2) *

Notes:

¹Referent = No modifications;²Referent = Behavioral Modifications;³Referent = Equipment Only;⁴CI = Confidence Interval*
p<.05***
p<.0005

Multivariate logistic regression equations predicting (a) any vs no use of compensatory strategies, (b) use of equipment or human help vs behavioral strategies only among those using a compensatory strategy, and (c) use of any human help vs equipment only among those using human help or equipment. For each compensatory strategy, models include (1) mobility difficulty, but not measured mobility performance, (2) measured mobility performance but not mobility difficulty, or (3) both mobility difficulty and measured mobility performance.

Table 4

	Any Compensatory Strategy ¹			Equipment or Human Help ²			Any Human Help ³		
	Difficulty	Performance	Difficulty + Performance	Difficulty	Performance	Difficulty + Performance	Difficulty	Performance	Difficulty + Performance
	OR (95% Confidence Interval)			OR (95% Confidence Interval)			OR (95% Confidence Interval)		
Difficult Mobility	16.5 (8.1, 34.0)	NA	7.8 (3.7, 16.5)	7.0 (4.8, 10.2)	NA	4.0 (2.6, 6.0)	0.54 (0.36, 0.80)	NA	0.68 (0.43, 1.1)
Better LE Physical Performance	NA	0.70 (0.66, 0.75)	0.76 (0.71, 0.81)	NA	0.67 (0.63, 0.72)	0.75 (0.69, 0.81)	NA	1.2 (1.1, 1.3)	1.1 (1.0, 1.3)
Dizzy	1.7 (1.3, 2.4)	1.8 (1.2, 2.5)	1.8 (1.3, 2.6)	1.2 (0.80, 1.7)	0.98 (0.67, 1.4)	1.1 (0.76, 1.7)	3.3 (1.9, 5.7)	3.8 (2.2, 6.5)	3.5 (2.0, 6.1)
Medicaid	1.1 (0.71, 1.7)	1.1 (0.68, 1.7)	1.1 (0.66, 1.7)	1.5 (0.93, 2.4)	1.4 (0.87, 2.3)	1.5 (0.88, 2.4)	0.51 (0.26, 1.0)	0.49 (0.25, 0.97)	0.50 (0.25, 0.98)
Education: Not HS graduate	0.70 (0.49, 1.0)	0.63 (0.43, 0.91)	0.62 (0.43, 0.90)	1.1 (0.72, 1.6)	1.1 (0.70, 1.6)	1.0 (0.65, 1.5)	0.94 (0.52, 1.7)	0.91 (0.50, 1.7)	0.93 (0.51, 1.7)
Cardiopulmonary impairment	.91 (0.59, 1.4)	0.89 (0.57, 1.4)	NA ⁶	1.3 (0.78, 2.0)	1.3 (0.81, 2.1)	NA ⁶	1.1 (0.55, 2.1)	1.1 (0.56, 2.1)	NA ⁶
Depression	1.7 (1.1, 2.4)	1.8 (1.2, 2.6)	1.6 (1.1, 2.4)	0.82 (0.55, 1.2)	0.98 (0.67, 1.4)	0.77 (0.51, 1.2)	1.1 (0.64, 1.9)	1.0 (0.60, 1.7)	1.1 (0.64, 1.9)
Home health RN or PT visit	1.1 (0.72, 1.6)	1.1 (0.71, 1.6)	0.94 (0.62, 1.4)	1.9 (1.3, 2.9)	2.0 (1.3, 3.1)	1.8 (1.1, 2.8)	0.63 (0.36, 1.1)	0.62 (0.36, 1.1)	0.65 (0.37, 1.1)
Vision impairment	1.7 (1.1, 2.5)	1.4 (0.94, 2.1)	1.4 (0.96, 2.2)	0.95 (0.58, 1.6)	0.73 (0.44, 1.2)	0.77 (0.45, 1.3)	1.0 (0.49, 2.1)	1.1 (0.53, 2.3)	1.1 (0.51, 2.2)
Income ⁴	0.99 (0.98, 1.0)	1.0 (0.99, 1.0)	1.0 (0.98, 1.0)	1.0 (1.0, 1.0)	1.0 (1.0, 1.05)	1.03 (1.01, 1.1)	0.99 (0.97, 1.0)	0.99 (0.97, 1.0)	0.99 (0.97, 1.0)
Income missing	0.77 (0.46, 1.3)	0.74 (0.44, 1.3)	0.76 (0.44, 1.3)	3.3 (1.8, 6.0)	3.1 (1.7, 5.7)	3.4 (1.8, 6.4)	0.61 (0.28, 1.3)	0.61 (0.28, 1.3)	0.60 (0.27, 1.3)
Race, White	0.66 (0.44, 1.0)	0.67 (0.44, 1.0) ⁷	0.65 (0.42, 1.0)	1.1 (0.69, 1.7)	1.0 (0.65, 1.56)	1.0 (0.65, 1.6)	0.95 (0.51, 1.8)	0.94 (0.51, 1.8)	0.95 (0.51, 1.8)
Not married, does not live alone ⁵	0.91 (0.61, 1.4)	0.87 (0.57, 1.31)	0.84 (0.55, 1.3)	1.3 (0.86, 2.1)	1.3 (0.80, 2.0)	1.2 (0.78, 2.0)	5.7 (2.9, 11.0)	5.8 (3.0, 11.2)	6.0 (3.1, 11.7)
Married, lives with 1 person ⁵	1.1 (0.67, 1.6)	1.4 (0.88, 2.2)	1.4 (0.89, 2.3)	0.64 (0.36, 1.1)	0.89 (0.50, 1.6)	0.84 (0.46, 1.5)	7.5 (3.0, 18.7)	6.5 (2.6, 16.2)	7.1 (2.8, 17.9)
Married, lives with >1 person ⁵	0.77 (0.38, 1.6)	0.93 (0.45, 1.93)	0.98 (0.47, 2.1)	0.72 (0.31, 1.7)	0.76 (0.31, 1.8)	0.73 (0.29, 1.8)	2.1 (0.62, 7.2)	2.0 (0.57, 6.8)	2.1 (0.60, 7.4)
Environmental barriers in home	1.3 (0.83, 2.1)	1.7 (1.0, 2.7)	1.7 (1.1, 2.8)	0.78 (0.46, 1.3)	1.0 (0.61, 1.8)	1.1 (0.61, 1.9)	1.0 (0.47, 2.3)	0.95 (0.43, 2.1)	0.94 (0.42, 2.1)

Note: NA = Not Applicable; HS = High School;

¹ Referent = No compensatory strategies;

² Referent = Behavioral Modifications;

³ Referent = Equipment Only;

⁴ In thousands of dollars;

⁵ Referent = Not married lives alone;

⁶ Not included in model as not significant in any of the preceding Difficulty or Physical Performance models;

⁷ Significant values are bolded, values which appear the same in the table may appear so due to rounding