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Relationship of Race And Poverty to Lower Extremity Function and Decline: Findings from the Women's Health and Aging Study

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Abstract

Race- and poverty-related disparities in physical function are well documented, though little is known about effects of race and poverty on functional decline and the progression of disability. We examined cross-sectional and longitudinal relationships between race, poverty and lower extremity function using data from moderately to severely disabled women in the US Women's Health and Aging Study, a short study of disabled community dwelling women aged 65 and over. Severity of lower extremity functional limitation was determined from scaled responses of reported difficulty walking ¼ mile, walking across a room, climbing stairs and stooping. Usual walking speed assessed over 4 meters was our objective measure of function. Of the 996 women who described themselves as black or white, 284 (29%) were black and 367 (37%) were living at or below 100% of the federal poverty level. Independent of demographic and health related factors, among white women, the poor exhibited consistently worse lower extremity function than the non-poor; this association, however, was not observed in black women. Among the non-poor, black women had slower walking speeds, and reported more limitation in lower extremity function than their non-poor white counterparts, even after adjusting for demographic variables and health related characteristics. After 3 years, accounting for baseline function, demographic and health-related factors, race and poverty status were unrelated to functional decline. Thus, while race and poverty status were associated with

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functional deficits in old age, they do not appear to impact the rate of functional decline or progression of disability over 3 years.

Keywords

health disparities; poverty status; functional decline; race; functional status; lower extremity functioning; women; USA

Introduction

In the United States, persons with lower socioeconomic status (SES) and members of racial and ethnic minorities consistently exhibit higher rates of mortality, morbidity, poor functioning, and disability (Clark, Stump, & Wolinsky 1997; Coppin et al., 2006; Federal Interagency Forum on Aging Related Statistics, 2004; Fried, 2003; Hayward, 1999; Hummer, 2004; Kelley-Moore & Ferraro, 2004; Mendes de Leon, Barnes, Bienias, Skarupski, & Evans, 2005; Miller, Wolinsky, Malmstrom, Andresen, & Miller, 2005; Rantanen et al., 1998). For the past two decades, federal agencies including the Department of Health and Human Services have made elimination of these disparities a primary goal (U.S. Department of Health and Human Services, 2001); yet race- and SES-related disparities in physical functioning and disability have persisted (Mendes de Leon et al., 2005; Schoeni, Martin, Andreski & Freedman, 2005).

Because race and SES are so closely linked in the United States, separating their effects on physical functioning among older adults has proven difficult (Hummer 1996; Kahn & Fazio, 2005). Some studies find race-related differences in functional status are explained by higher rates of poverty, lower educational attainment and income among black participants (Clark & Maddox, 1992; Coppin et al., 2006; Clark, 1993; Liao, supplement McGee, Cao, & Cooper, 1999; Peek, Coward, Henretta, Duncan, & Dougherty, 1997; Schoenbaum & Waidmann, 1997; White-Means, 1993). Others find evidence for racial inequalities in underlying health status (Kelley-Moore & Ferraro, 2004; Kington & Smith, 1997; Mendes de Leon, 1997), and an independent association between race and health (Williams, 1999).

In addition to concern about persistent race and SES disparities in health and functioning of older people, there is interest in whether rates of health decline differ by these characteristics. Here evidence is less abundant. Kelly-Moore and Ferraro (2004) found a persistent, but stable gap in ADL limitations, over 6 years. Another recent study using cross-sectional trend data (Schoeni et al., 2005) also suggests that race differences in ADL disability have been relatively constant while SES differences have increased.

This manuscript contributes to the growing literature regarding racial and economic disparities in functional status among community dwelling older adults by examining race and poverty-related differences in the progression of disability. To do so, we draw on both self reports of disability and performance-based measures of functioning. Previous research on race and SES effects has relied on self-reports of limitations in activities of daily living and instrumental activities of daily living (Mendes de Leon et al., 2005; Coppin et al., 2006). Objective assessments of functioning represent a different, and complementary measure of the same phenomenon -- one that may be less subject to differences in measurement equivalence across race or SES subgroups (Harkness, Van de Vijver, FJR & Johler, 2003) than self-report measures.

In this study, we determine the independent and joint associations of race and poverty status to mobility and lower extremity function and to rates of functional decline over a three year

period using The Women's Health and Aging Study (WHAS) . We hypothesized that black and poor women would exhibit poorer physical function, independent of other social and health-related factors compared to their white and non-poor counterparts, and further, that black and poor women would have steeper rates of decline in physical functioning. However, consistent with previous work (Peek et al., 1997), we believe that race-related associations reflect the higher rates of poverty in black populations and therefore, expected that within and possibly across racial groups, poverty status would show a strong association with function and rate of functional decline. Existing research, however, has not accounted for initial health and functional status, potential confounding factors that may affect relationships among race, poverty status, and self and objective assessments of lower extremity function as they relate to the progression of functional decline and disability.

Methods

Study population

WHAS is a prospective investigation of the causes and course of disability in older women, developed and supported by the National Institute on Aging and conducted by the Johns Hopkins Medical Institutions. The study cohort consists of 1,002 moderately or severely disabled community dwelling women aged 65 or older. The WHAS sample was taken from an age-stratified random sample of 6,521 women drawn from all female Medicare beneficiaries in 12 contiguous zip codes in Baltimore City and Baltimore County. In-person screening interviews were conducted to determine study eligibility, with the aim of recruiting a sample representing the bottom one-third of the functional spectrum among community-resident women 65 years and older. Criteria for participation consisted of reported difficulty in at least two out of four areas of functioning (upper extremity, mobility, higher functioning (e.g., selected instrumental activities of daily living), basic self-care, a Mini-Mental Status Examination (MMSE) score of 18 or above, and community residence. Of the 4,137 women screened (78% of those eligible), 1,409 met eligibility criteria, and 1,002 (71%) agreed to study participation and completed the baseline interview and in-home clinical examination (Simonsick et al., 1997). Participants were enrolled between November 1992 and February 1995. Follow-up questionnaires and physical performance measures were administered every six months for three years. Of the 1002 women at baseline, 70% participated in all seven interviews. Of the remainder, 141 women have 5 or 6 interviews, and only 15% have no data beyond the baseline interview. Attrition was largely due to death, with only 5% of the baseline sample being considered lost to follow up before death. Mortality rates did not differ by race or poverty status. All participants provided informed consent. More details on the WHAS study design can be found elsewhere (Guralnik, 1995; Kasper, Shapiro, Guralnik, Bandeen-Roche, & Fried, 1999).

Variables

Mobility and lower extremity function—Severity of lower extremity functional limitation was based on a scale derived from reported levels of difficulty walking ¼ mile, walking across a small room, climbing 10 steps, and stooping crouching or kneeling. Women with no difficulty walking across a small room were assigned scores ranging from zero to four based on their reported difficulty walking ¼ mile. Those reporting little or some difficulty walking across a room were assigned a score of five, and women with a lot of difficulty or unable to walk across a room were assigned a score of six. Scores for difficulty climbing ten steps without resting were assigned as 0=none, 1=a little or some, and 2=a lot or unable to do. Difficulty stooping, crouching or kneeling was dichotomized as able to do (with or without difficulty) or unable with scores of zero and one, respectively. Scores were summed to create a ten point summary scale (ranging from 0–9) with a lower score indicating better lower extremity functioning. This scale has been validated against self-reported disability and

performance based testing and was found to represent a discrete measure of limitation (Simonsick et al., 2001).

Usual walking speed, our objective measure of lower extremity of functioning, was assessed by having the participant walk at her normal pace over a 4-meter course measured out in the home (a 3-meter course was used if 4 meters were not available). Walking aids were permitted. The faster of two walking trials constituted usual walking speed in meters per second (m/s). Higher numbers reflect better function. Walking test performance has been shown to be highly reproducible (Guralnik et al., 1994; Simonsick, Gardner, & Poehlman, 2000; Simonsick et al., 2001). Women who did not attempt the walk, were unable to walk because they or the examiner felt it was unsafe, or could not walk even with assistance were assigned a speed of 0 m/s.

Functional decline—Criteria defining decline were developed for each measure of lower extremity function. Briefly, decline in reported lower extremity function was characterized as an increase of one or more points in the limitation score from baseline sustained over a minimum of two consecutive six month visits. This could be a one point increase maintained over two consecutive visits or an increase of one or more at each of the two consecutive visits. For usual walking speed, a decrease of 0.15 m/s from baseline sustained over no less than two consecutive six month visits was considered a decline. This decline could be a decrease of 0.15 m/s maintained over two consecutive visits or a decrease of 0.15 m/s or more at each of the two consecutive visits. This value is consistent with estimates of what constitutes meaningful change for usual walking speed (Perera, Mody, Woodman, & Studenski, 2006). The requirement that each decline be sustained over two consecutive visits distinguishes persistent from transient limitations.

Race and poverty status—Women self reported their race based on the following question “Which of the following best describes your race?” Analyses only include women who reported themselves as being either white or black (n=996; 99% of the total WHAS population). Poverty status was constructed using a set of thresholds, specific to the year(i.e., 1992–1995) in which the participant was recruited, for the Federal Poverty Level (FPL) that combine money income, family size and composition to determine who is poor. Each study subject was assigned a value, in the form of a percentage, representing her relationship to the FPL. For descriptive purposes, we present three categories of poverty status (<100% (poor), 100–200% (near poor), >200% (not poor)), but dichotomize poverty status at 100% in the analyses. This indicator is frequently used and has real world importance since it constitutes a key component of eligibility determinations for public assistance (e.g. Supplemental Security Income and Medicaid) (Peek et al., 1997).

Baseline demographics—Demographic variables included age (years), income, living arrangement (0=lives alone, 1=married, 2=lives with others), education (0=did not complete high school; 1=high school graduate, 2=more than high school graduate), and supplemental health insurance (0=Medicare only, 1=Medicare and Medicaid/public assistance, 2=Medicare and private insurance).

Health-related characteristics and conditions

Health-related characteristics include smoking status (0=never or former smoker; 1=current smoker or quit within past year; 0), self-reported health status (0=excellent/very good; 1=good; 2=fair or poor), and body mass index (BMI), calculated (weight (kg)/height (m²) from measured weight and height. Participants' weight status was classified as BMI < 25, BMI ≥ 25 and < 30, or BMI ≥ 30. MMSE was used to indicate the participants' level of cognitive functioning (Folstein, Folstein, & McHugh, 1975). Depressive symptomatology was assessed using the Geriatric Depression Scale (Yesavage, Brink, Rose, Lum, Huang, Adey, Leirer et

al., 1983). Forced expiratory volume in the first second (FEV₁), determined from spirometry served as an indicator of pulmonary function. A centering approach was used to include women with missing values for FEV₁. This approach consists of subtracting the sample mean from each individual's value to create a new variable with a mean of 0 and assigning those with missing values a score of 0. A binary variable representing presence or absence of a valid spirometry test was included. This approach allowed us to include 35% of the participants who had unacceptable spirometry results (Simonsick, Guralnik, Volpato, Balfour, & Fried, 2005). Unlike most studies that rely on respondent self-report of diseases and conditions, the WHAS obtained clinical data from a study in-home examination by a nurse, and from medical records obtained from usual care physicians and hospitals. Algorithms to determine disease presence of 17 chronic conditions were developed by a panel of medical specialists and applied to the information obtained from these sources in a standardized way. More information has been published elsewhere (Simonsick et al., 1997). Binary variables were created for each health condition and further classified into four clinically meaningful domains: musculoskeletal (osteoarthritis of hand, knee or hip, osteoporosis, disk disease, hip fracture, rheumatoid arthritis, or spinal stenosis), cardiopulmonary (pulmonary disease, angina, peripheral arterial disease, myocardial infarction, congestive heart failure), neurosensory (hearing or vision problem, stroke or Parkinson's disease), and diabetes. This disease classification scheme is similar to what others have used as a framework for understanding the impact of chronic conditions on physiologic capacity that affects function (Badley, Lee, & Wood, 1987; Buchner & Wagner, 1992).

Statistical analyses

Chi-square and Student's *t* tests were performed to examine the proportional and mean differences between race categories for the demographic, health-related characteristics and conditions, and lower extremity function measures. General linear models were used to calculate adjusted mean scores for each lower extremity function measures as a function of the demographic and health-related characteristics and conditions. Logistic regression analyses were used to calculate odds ratios (OR) and 95 percent confidence intervals (CI) for the association of race, poverty, and functional decline over three years. To evaluate the association between race, poverty status and time to onset of functional decline, Cox regression models were used. Women completing the study with no evidence of functional decline were censored at the last study visit, those dying with no evidence of functional decline were censored at their date of death, and those lost to follow-up were censored after their last interview date. Median followup time for lower extremity limitation, and walking speed was 724 days, and 1097 days, respectively. All analyses were conducted in a progressively more complex manner to examine the effects of each block of variables with respect to race and poverty and how they influence physical function. Due to an extended recruitment period, the first follow-up (round 2) averaged 245 days (about 8 months) after baseline, the second and subsequent follow-ups (rounds 3 – 7) averaged between 171 to 186 days (about 6 months). These patterns did not differ by race or poverty status. Model 1 included age; model 2 added education, living arrangement, and supplemental health insurance, and model 3, the fully adjusted model, included variables in model 2 plus self-rated health, smoking status, weight status, FEV₁, musculoskeletal disease, MMSE score, depressive symptomatology, neurosensory disease, cardiopulmonary disease, and diabetes. We controlled for baseline functional status in all of our longitudinal analyses. P-values < .05 were considered statistically significant and all tests were two-sided. Analyses were conducted using SAS version 9.1.3 for windows (SAS Institute, Inc., Cary, North Carolina). In preliminary analyses we found a significant interaction between race and poverty status for each of the functional outcomes. Thus, we examined four groups defined by race and poverty status.

Results

Table 1 shows the distribution of participant characteristics at baseline by race and poverty status. Black women were younger, poorer, and had a higher prevalence of musculoskeletal disease and diabetes than white women. Black and poor women were more likely to have Medicaid/public assistance as their supplemental health insurance and were less likely to graduate from high school, be married, and live alone relative to white and non-poor women, respectively. In general, both black and poor women show poorer health status than their white and non-poor counterparts, with higher rates of self-reported fair/poor health, obesity, unascertainable FEV₁, and a lower mean FEV₁. The prevalence of neurosensory diseases, cardiopulmonary diseases and smoking status were similar across groups.

Adjusted means for lower extremity functioning stratified by race and poverty status are shown in Table 2. Among white women, the poor exhibited consistently worse lower extremity function than non-poor; this poor-non-poor dichotomy, however, was not apparent in black women. Among the non-poor, black women had slower walking speeds (0.52 vs. 0.65 m/s, $p < 0.05$), and reported more severe limitation in lower extremity functioning (4.39 vs. 3.64 points; $p < 0.05$) than their non-poor white counterparts, even after adjusting for demographic factors and health-related characteristics. No differences were observed in any of the functional measures when comparing black poor women with white poor women.

As Table 3 shows, all race and poverty status subgroups experienced similar rates of decline. For example, approximately half had a sustained decline in lower extremity function assessed by self-report and just below 30 percent had a sustained decline in walking speed within three years. No differences in the likelihood of functional decline were observed among any of the race-poverty status groups, overall or for poverty status within race designation (Table 4). As evident from the survival curves in Figure 1, there are no race-poverty status differences in the time to onset of meaningful sustained lower extremity functional decline. Although poor black women initially demonstrated a faster rate of decline in walking speed than non-poor white women this difference was attenuated after adjustment for demographic factors and health related characteristics.

Discussion

In this study, we examined the cross-sectional and longitudinal relationships between race and poverty and lower extremity function using data from moderately to severely disabled, older women participating in WHAS. We found that black race and poverty were associated with poorer functional status, independent of demographic and health-related factors even within a functionally limited subset of urban community-resident women. Among white women, those in poverty had worse function; this dichotomy was not apparent in black women. After 3 years, accounting for baseline function, demographic and health-related factors, race and poverty was unrelated to functional decline.

The race- and poverty-related differences in lower extremity functioning observed at baseline are consistent with recent studies and supports the hypothesis that racial and economic differences have a persistent association, independent of social and health factors (Kington & Smith, 1997; Mendes de Leon, 1997) in functionally limited older women, as well. Also, when examining poverty differences within racial group, our results are consistent with others (Chen, 1994; Peek et al., 1997) such that high rates of poverty explained the racial difference between black and white women with respect to the functional measures; whereas the poverty did not explain the racial differences among the nonpoor women. Other unmeasured factors may explain the residual race and poverty-related associations with functional status. Greater cumulative exposure to both environmental and occupational hazards and higher rates of

disease may contribute to the poorer health status and thereby poorer functional status in late life among older Black adults (LaVeist, 1993; Massey & Hajnal, 1995; Williams & Collins, 2001). High levels of residential segregation by race and income persist which creates different living environments in which people experience aging (Iceland, Weinberg, & Steinmetz, 2002). This difference can affect exercise, access to resources, and social engagement opportunities. Perhaps, fewer resources are available to compensate for functional limitations. Further research in this area should consider the communities where individuals have worked and lived throughout their lives to better understand the potential malleable factors that foster race- and poverty-related health disparities.

Contrary to expectations, baseline differences in functional status by race and poverty status were not reflected in steeper or more rapid rates of decline over three years. This finding is consistent with two other studies that have examined development of disability in black and white older adults independent of social and health factors (Kelley-Moore & Ferraro, 2004; Liao et al., 1999; Clark, 1997; Peek et al., 1997), but extends the findings to self report and performance based measures of functional limitations. This suggests that differences observed at baseline may reflect cumulative disparities in health-related factors much earlier in the life course; e.g., younger age at disease onset and lower functional reserve in mid-life. Consistent with this premise, black women in the WHAS cohort had poorer general health and lung function and higher rates of obesity and diabetes all of which negatively impact physical function (Boult, Kane, Louis, Boult, & McCaffrey, 1994; Jensen & Friedmann, 2002; Seeman et al., 1994).

Our findings are not consistent, however, with a few studies that have found race- and SES-related differences in declines in disability (Schoeni et al. 2001, Manton & Gu, 2001, Mendes de Leon et al., 2005). With the exception of work by Mendes de Leon and colleagues (2005), these studies used self-report measures of limitations in or inability to perform activities of daily living and/or instrumental activities of daily living. Our self-report measure was constructed as a measure of severity of limitation in lower extremity function (Simonsick et al., 2001). For our performance base measure we used walking speed. One explanation for the difference in the findings is that we are attempting to quantify differences as it relates to the progression of disability in a already functionally limited older population; whereas this is not the case in previous work. Additional research examining race- and SES-related differences in the natural history of functional decline in diverse older populations is needed.

In this study, our findings for self-report and objective measures of functioning followed similar patterns of significance. Although there are moderate to high correlations between self report and measured physical performance, they are likely to represent distinct dimensions of the same phenomenon (Jylha, Guralnik, Balfour, & Fried, 2001; Simonsick et al., 2001). However, we speculate that objective measures such as walking speed may provide more sensitive assessments of physical function than subjective questions. Several factors can influence what is perceived as difficulty where this is not true for objective measures (Guralnik & Kaplan, 1989; Jylha et al., 2001; Simonsick et al., 2001). Also, measurement of distal end points through self reports may not capture change in underlying physical health as precisely as objective measures. Despite our current findings, we encourage investigators to include both self-report and performance based measures in the future.

Several aspects of the study warrant comment. First, because the WHAS cohort represents the bottom one-third of the functional spectrum, we examined decline within a group of women who had already sustained some lower extremity limitations; therefore, we were unable to determine whether the observed race and poverty relationships were present at earlier stages in the disablement process. Also, we may have experienced a 'floor effect' whereby a substantial proportion of women may have reached a level of debility below which we cannot

detect further decline in function. Hence, the external validity is limited to this segment of the older population. Further examination is needed in a population of older adults with a higher level of functioning, preferably free of functional limitations at study inception. Second, although we adjusted for prevalent health conditions, we could not account for variation in the severity of these conditions. Thus, we cannot rule out the possibility that differences in severity of disease burden contribute to the relationship between race, poverty status, and lower extremity function. Finally, WHAS obtained information on other health conditions such as cancer, but the focus of the study was on chronic disabling conditions and these were the 17 conditions that were clinically ascertained. In this older population, self-reported cancer was 13.3% for all types of cancers. Cancer is not usually viewed as a chronic condition until it reaches the terminal stages, although some cancers now approach chronicity from the longevity view point.

A major strength of this study includes having a cohort with a sufficient number of black women and reasonable variation in poverty status within race groups that permitted treatment of race and poverty status as separate constructs (Kawachi, Daniels, & Robinson 2005; Williams, Lavizzo-Mourey, & Warren, 1994). Another strength is the use of objective and self-report measures of lower extremity functioning. This study adds to the existing literature by examining relationships among race, poverty status, and functional status and decline with a greater degree of control over potential confounding factors, and accounts for both initial health conditions and functional status.

In summary, within a functionally limited cohort of older women, both black and poor women exhibited greater functional deficits with poverty status having a strong independent association within white women. The longitudinal findings suggest that the higher incidence of disability found in poor and minority populations in old age reflect the poorer initial health and functional status of these groups at study inception. To more fully evaluate effects of race and poverty status on the disablement process, these relationships should be examined in higher functioning and younger populations earlier on in the disablement process. Moreover, findings from the progressive models indicate that other social and behavioral factors and possibly physiologic factors rather than overt disease diagnoses may underlie race- and poverty-related functional disparities in moderate to severely disabled community dwelling older women. Further efforts to better understand the effects of race and poverty on function should move toward identifying malleable social, environmental, and behavioral factors that may help explain the mechanism that produce such inequalities.

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Figure 1.

Survival curves for the onset of functional decline over three years in the Women Health and Aging Study. (A) Models adjusted for age and baseline functional status. (B) Models adjusted for adjusted for age, baseline functional status, education, living arrangement, and supplemental health insurance. (C) Models adjusted for adjusted for age, baseline functional status, education, living arrangement, supplemental health insurance, smoking status, self-rated health, depressive symptomatology, MMSE score, weight status, forced expiratory volume in first second, musculoskeletal disease, neurosensory disease, cardiopulmonary disease and diabetes. White non-poor women were used as the referent group.

Table 1

Baseline Characteristics by Race and Poverty Status Among Women's Health and Aging Study Participants

Characteristic	Black (n=284)	White (n=712)	Poor (n=367)	Non-poor (n=629)
Age, mean±SD	76.7±7.86	79.0±8.05***	78.0±7.8	78.5±8.1
Black, %	--	--		
Poverty Level, %			--	--
< 100%	64.1	25.9	--	--
100–200%	27.5	36.9	--	--
>200%	8.5	37.1***	--	--
Income				
Minimum	960	0	0	6800
25 th percentile	5000	7200	4800	10000
Median	6700	12500	5670	15000
75 th percentile	10380	20000	7000	25000
Maximum	65000	300000***	17000	300000***
Percentage of Federal Poverty Level				
Minimum	0.05	0	0	1.00
25 th percentile	0.57	0.96	0.51	1.29
Median	0.81	1.47	0.69	1.80
75 th percentile	1.15	2.66***	0.80	2.97***
Maximum	9.37	44.58***	0.99	44.58***
<i>Demographics</i>				
Education level, %				
< High school graduate	81.9	57.6	81.6	54.6
High school graduate	11.3	20.0	13.1	20.1
More than high school graduate	6.7	22.3***	5.1	25.2***
Living Arrangement, %				
Married	13.0	25.4	9.5	27.1
Living with someone	44.3	23.7	48.7	20.3
Living alone	42.6	50.8***	41.6	52.4***
<i>Insurance Status</i>				
Medicare only	27.4	12.3	24.2	12.2
Medicare and Medicaid/Public assistance	40.1	6.3	31.8	6.6
Medicare and private insurance	32.3	81.3***	43.8	81.0***
<i>Health-related characteristics</i>				
Self-rated health				
Excellent/Very Good	13.5	20.7	16.2	20.0
Good	22.4	32.9	24.7	32.9
Fair/Poor	64.1	46.4***	59.1	46.9**
Current smoker or quit in late life, %	15.1	15.2	16.1	14.6
FEV ₁ , mean±SD	1.33±0.40	1.44±0.46**	1.34±0.41	1.45±0.46*
Unascertainable FEV ₁ , %	46.8	31.8***	40.1	33.8*
Depressive Symptoms, mean±SD	7.28±5.06	8.30±5.84**	8.62±5.64	7.66±5.62**
Mini-Mental State Examination, mean ±SD	25.38±3.18	26.79±2.85***	25.75± 3.20	26.76±2.83***
Weight status, %				
BMI ≤ 25	26.0	34.3	25.8	34.9
25 ≤ BMI < 30	29.1	35.8	31.8	34.6
BMI ≥ 30	36.4	29.8***	42.2	30.5**
Prevalent chronic disease, %				
Musculoskeletal	75.4	86.2***	81.4	84.1
Neurosensory	52.5	58.9	58.5	56.1
Cardiopulmonary	60.6	65.3	62.6	64.7
Diabetes	25.7	12.3***	16.8	15.5
<i>Lower extremity functioning measures</i>				
Lower Extremity Limitation Score, mean ±SD	4.32±2.91	3.82± 2.90*	4.53± 2.96	3.63±2.83***
Usual Walking Speed, mean±SD	0.52±0.28	0.63±0.32***	0.52± 0.29	0.65± 0.31***

Notes: SD = Standard deviations; Depressive symptoms were based on scores from the Geriatric Depression Scale consisting of 30 items with a yes/no format, with higher scores reflecting more depressive symptomatology.

* p<0.05

** p<0.01

*** p<0.001

Table 2

Baseline Adjusted Means of Lower Extremity Function Measures by Race and Poverty Status in the WHAS

	Model 1	Model 2	Model 3
Lower Extremity Limitation Score			
Black			
Poor	4.42	4.16	4.20
Non-poor	4.53 ^a	4.42 ^a	4.39 ^a
White			
Poor	4.69 ^b	4.59 ^b	4.36 ^b
Non-poor	3.44	3.57	3.64
Usual Walking Speed (m/s)			
Black			
Poor	0.49	0.53	0.53
Non-poor	0.49 ^a	0.51 ^a	0.52 ^a
White			
Poor	0.54 ^b	0.56 ^b	0.57 ^b
Non-poor	0.68	0.66	0.65

Notes: Model 1 adjusted for age. Model 2 adjusted for age, education, living arrangement, and supplemental health insurance. Model 3 adjusted for factors in Model 2 plus the smoking status, self-rated health, depressive symptomatology, MMSE score, weight status, forced expiratory volume in the first second, musculoskeletal disease, neurosensory disease, cardiopulmonary disease and diabetes.

^aStatistical significance(P<0.05) black compared to white adults within poverty status.

^bStatistical significance(P<0.05) poor compared to non-poor adults within that racial category.

Table 3

Age Adjusted Prevalence of Functional Decline Over Three Years by Race and Poverty Status in the Women's Health and Aging Study Participants

Functional Decline Measures	Black		White	
	Poor	Non-poor	Poor	Non-poor
Lower Extremity Limitation Score, %	52.5	52.6	47.2	54.8
Usual Walking Speed, m/s, %	26.8	22.0	28.8	29.0

Notes: *p<0.05, **p<0.01, ***p<0.001.

Table 4

Association of Functional Decline Indicators Over Three Years According to Race and Poverty Status in the WHAS Study

Outcomes	Model 1	Model 2	Model 3
	Odds Ratio (95% Confidence Interval)		
Lower Extremity Limitation Score			
Black			
Poor	1.05 (0.74, 1.51)	0.82 (0.52, 1.29)	0.78 (0.48, 1.25)
Non-poor	1.04 (0.66, 1.65)	0.91 (0.56, 1.49)	0.84 (0.50, 1.40)
White			
Poor	0.86 (0.60, 1.24)	0.74 (0.50, 1.11)	0.71 (0.47, 1.06)
Non-poor	1.0	1.0	1.0
Usual Walking Speed, m/s			
Black			
Poor	1.32 (0.87, 2.00)	1.12 (0.67, 1.88)	1.04 (0.61, 1.80)
Non-poor	0.97 (0.55, 1.70)	0.88 (0.49, 1.58)	0.79 (0.42, 1.47)
White			
Poor	1.34 (0.89, 2.01)	1.24 (0.79, 1.92)	1.20 (0.76, 1.89)
Non-poor	1.0	1.0	1.0

Notes: White non-poor women were used as the referent group. Model 1 adjusted for age and baseline functional status. Model 2 adjusted for age, baseline functional status, education, living arrangement, and supplemental health insurance. Model 3 adjusted for factors in Model 2 plus the smoking status, self-rated health, depressive symptomatology, MMSE score, weight status, forced expiratory volume in the first second, musculoskeletal disease, neurosensory disease, cardiopulmonary disease and diabetes.