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Effect of street connectivity on incidence of lower-body functional limitations among middle-aged African Americans

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Abstract

Purpose—We hypothesize that lower street connectivity increases the risk of incident lower-body functional limitations (LBFL) among urban African Americans aged 49–65 years.

Methods—This population-based cohort was interviewed in-home. Five items measuring LBFL were obtained at baseline and after 3 years. Participants were considered to have LBFL if they reported difficulty on at least 2 of the 5 tasks. Census-tract street connectivity was measured as the ratio of the number of street intersections to the maximum possible number of intersections.

Results—Of 563 subjects with zero or one LBFL at baseline, 109 (19.4 %) experienced two or more LBFL at the 3-year follow-up. Adjusted logistic regression showed that persons who lived in census tracts with the lowest quartile of street connectivity were 3.45 times (95% confidence interval: 1.21 – 9.78) more likely to develop two or more LBFL than those who lived in census tracts with the highest quartile of street connectivity independent of other important environmental factors.

Conclusions—Areas with low street connectivity appear to be an independent contributor to the risk of incident LBFL in middle-aged African Americans.

Keywords

Disparity; Built environment; Disability; Neighborhood

INTRODUCTION

Poor or worsening lower-body function plays a crucial role in the disablement process for older adults and has been associated with increased disability days, physician contacts, falls, hip fracture, depression, nursing home placement, and mortality (1, 2). In addition to individual risk factors for disability, poorer environmental or neighborhood conditions appear to increase the risk of disability (3–9). The World Health Organization's (WHO) social model of disability, the International Classification of Functioning, Health and Disability (ICF), includes the influences of both individual factors and the environment on disability (10–12). The addition of environmental influences on disability is important because of older adults increased vulnerability to adverse neighborhood conditions. Glass and Balfour developed a model that also includes potential mechanisms by which neighborhood conditions affect disability (13). Finally, we note that environmental features are a key element in Verbrugge and Jette's (14) highly cited extension of the original Nagi (and Institute of Medicine) model(s) of disability (15, 16), which have been closely tied to the environment in subsequent elaborations (17). However, studies to date generally examined only a few neighborhood characteristics and conditions, and measures varied across studies. For example, some studies have used observed neighborhood conditions, some used residents' perceived conditions, and other studies used secondary data such as census-based information (18). In general, this research has been very limited in its ability to identify specific features of the environment that exert independent effects on disability. Theory and disablement models would benefit from more empirical work that examines specific neighborhood features.

One aspect of neighborhoods that has received a lot of attention recently is the built environment (i.e., the human-made surroundings that provide the setting for human activity, ranging in scale from personal shelter and buildings to structures of neighborhoods and cities), which includes street connectivity (i.e., streets leading to other streets and stores, rather than ending in cul-de-sacs). However, street connectivity has been examined mainly with its association to physical activity and body mass index, e.g. (19–22). In addition to physical activity, there are many other ways by which the built environment might increase the risk of lower-body functional limitations (LBFL), including increased psychological stress, higher blood pressure, lower access to medical care, higher social isolation, and lower collective efficacy and social capital (13, 19, 20, 23–25). To date, few studies have examined the effect of street connectivity on risk of LBFL, particularly among urban African Americans, who are at increased risk of poor health outcomes (26) and many of whom are exposed to adverse neighborhood conditions. Two previous studies did not find associations between street connectivity and risk of LBFL, but few African Americans were included (7, 27). While African Americans have well documented disparities compared to white in both neighborhood conditions and in health outcomes, it is unclear what street connectivity might contribute to understanding the influence of neighborhood conditions and function within African American populations.

This study addresses the current gap in the literature by hypothesizing that lower street connectivity increases the risk of LBFL using data from the African American Health (AAH) study, a longitudinal study of urban African Americans aged 49–65 years at baseline (26), independently of other important aspects of the study participants and their environment. Investigations of the effect of neighborhood conditions on functioning are especially important for older populations based on their longer exposure to neighborhood stressors and the greater importance of their proximity to health care, food, and other resources and services. In addition, environmental determinants may be accentuated among older adults based on their greater biological and psychological vulnerability (9, 13).

METHODS

Baseline and follow-up sample

The sampling design of the prospective AAH study has been described elsewhere (28). Briefly, the AAH study includes 998 African Americans who were born from 1936 through 1950 and who lived in an inner-city area (St. Louis, MO) or suburbs just northwest of the City of St. Louis. Sampling proportions were set to recruit approximately equal numbers of subjects from both areas (sampling strata), which resulted in higher probabilities of selection in the inner city due to its having fewer eligible subjects. Thus, weighted data are used in all analyses. A weight for each AAH participant was constructed taking into account participant selection probability, sample nonresponse, and a post-stratification weight based on the 2000 Census. The AAH cohort represents the noninstitutionalized African American population aged 49 to 65 in the two areas as of the 2000 Census when using these weights.

Inclusion criteria involved self-reported black or African American race, Mini-mental Status Examination scores > 16 (29), not in an institution (e.g., nursing home, hospital) and willingness to sign informed consent. AAH participants were included regardless of their disability status. All subjects received in-home, baseline evaluations that averaged 2.5 hours, which occurred between September 2000 and July 2001 (participation rate=76%). The Institutional Review Board at the involved institutions approved the study.

In-home interviews (1.5 hours on average) were conducted again 36 months after baseline assessments. Of the 998 persons who participated at baseline, 853 were successfully interviewed at follow-up. Since 51 persons had died between baseline and follow-up, the response rate for surviving subjects was 90.1%.

Lower body functional limitations

Five items from the Nagi physical performance scale assessed LBFL. Subjects who reported any difficulty or inability to perform the function or task at the time of the interview were considered to be limited in that function/task (0=no difficulty/no inability, 1=difficulty or inability), which were summed to form the outcome measure (ranging from 0 to 5) (26). Specific items included difficulties in walking a quarter of a mile; walking up and down 10 steps without rest; standing for 2 hours; stooping, crouching, or kneeling; and lifting 10 pounds (15). Similar to other studies (5, 8, 30), we limited study participation in the current analysis to those with one or fewer LBFL at baseline in order to examine the risk of developing two or more LBFL three years later. At follow-up, we defined incident LBFL as reporting difficulty or being unable to perform at least two of the five physical tasks among those with one or fewer LBFL at baseline.

Neighborhood and housing conditions

Two neighborhood variables were measured at the census tract: street connectivity as a measure of the built environment and poverty rate as a measure of the neighborhood economic environment (27, 31). Baseline street addresses for all participants were successfully matched to census tracts using geocoding (32). Street connectivity, the main independent variable of interest, can be measured several ways (33). We used the *alpha index*, which is calculated based on the ratio of the number of street intersections to the maximum possible number intersections, given by the formula: (# street segments − # intersections + 1)/(2 * [# of intersections] − 5). Street segments were constructed based on the 2000 TIGER file and aggregated to the census tract level. The *alpha index* had the highest factor loading when using multiple measures to describe street connectivity (27, 34) and was obtained from RAND (35). The values for the *alpha index* range from 0 to 1, with higher values representing a more connected street network.

Three sets of additional neighborhood and housing variables were measured at the individual level: the interviewer's rating of the external appearance of the block on which the participant lived; a home assessment by the interviewers, in which they rated the interior and exterior of the participant's building; and a subjective measure of neighborhood conditions via participant self-report. An "objective" assessment of the external appearance of the block face in front of the homes where the participants resided was completed by the survey field team (3) during household enumeration, which occurred an average of seven months before the in-home interviews were obtained. On four-point scales (1=excellent, 4=poor) observers rated each of five characteristics: condition of houses, amount of noise (from traffic, industry, etc.), air quality, condition of the streets, and condition of the yards and sidewalks in front of homes where the participant lived (36).

Assessment of housing conditions was an observed five-item scale based on the interviewer's ratings at the baseline interview of the cleanliness inside the building; physical condition of the interior; condition of furnishings; condition of the exterior of the building; and a global rating (all rated as excellent, good, fair, or poor). Each block face condition and each housing condition was dichotomized as either fair or poor versus good or excellent.

We also obtained a subjective measure of neighborhood desirability from respondents at baseline using a four-item scale of the neighborhood as a place to live, general feelings about the neighborhood, attachment to the neighborhood, and neighborhood safety from crime (28, 37).

Individual covariates

Baseline covariates included were patterned after other studies (5, 8, 27, 30, 38) (Table 1): age, gender, income categories, perceived income adequacy, educational attainment, marital status, employment status, number of persons in household, having health care insurance at the time of or during the 12 months prior to interview, and not being able to see a doctor because of cost during 12 months prior to interview. Social support was measured using five items from the Medical Outcomes Study social support instrument (39). Health status was measured by SF-36's self-rated health status question, clinically relevant levels of depressive symptoms using the 11-item Center for Epidemiologic Studies Depression scale (40), and a count of the number of self-reported physician-diagnosed severe chronic conditions ever experienced by the participant. A score of 9 or greater on this version is equivalent to the usual clinically relevant depressive symptoms criterion of 16 or greater on the 20-item scale (41). The presence of one LBFL at baseline was also noted using the same Nagi physical performance scale. Also assessed at baseline were body mass index, current smoking status, and the Yale Physical Activity Scale (42). Five indices were created by multiplying responses to questions about the frequency and duration for each of five specific activities (i.e., vigorous activity, leisurely walking, moving, standing, and sitting). A measure of risk of alcohol abuse based on the CAGE was obtained by telephone interview one year after baseline (43).

Statistical analysis

First, we calculated unadjusted measures of association (odds ratio [OR] and 95% confidence intervals [CI]) between quartiles of street connectivity (*alpha index*) and the risk of incident LBFL at 3-year follow-up using two-level logistic regression since study participants were nested within census tracts. The random component was assessed at the census tract level. We found no evidence of extra binomial variation at the individual level using Chi-square tests in an empty model, suggesting that the logistic model is appropriate. The *alpha index* was grouped into quartiles based on the distribution of census tracts in order to examine nonlinearity. Multilevel models were developed and fitted using the SAS (version 9.2) glimmix macro. Parameters were evaluated with the Wald test (44).

Because multivariable logistic regression may be limited in its ability to control for confounders in studies of neighborhood effects when there are fewer than 10 events per variable analyzed (45), we reduced the variables in the final adjusted model by examining the association of the individual- and neighborhood-housing variables with risk of incident LBFL at 3-year follow-up. Only variables with a p-value for the likelihood ratio test that was 0.15 or less were further considered for inclusion as potential confounders in the multivariable model. Variables that did not change the odds ratio for the street connectivity variable by at least 10% when comparing models with and models without those variables were excluded from the model. The final, multivariable model includes the *alpha index* quartiles variables and potential confounders.

We conducted a series of analyses to challenge the robustness of the findings. We expected that persons who resided longer in their neighborhood would have more exposure or opportunity to be affected by the physical and social environment than persons who resided in that neighborhood for a shorter period of time. We also examined if other measures of street connectivity (33): average block length (average length [perimeter] of street blocks in feet) (35), average block size (average area of street blocks in square feet) (35), and housing density (ratio of the number of housing units per square mile) from the 2000 census showed the same associations with LBFL incidence. To investigate the potential effect of a different definition of LBFL on the results, we limited the analysis to baseline subjects without any LBFL.

RESULTS

Analysis excluded 290 participants who reported having two or more LBFL at baseline, leaving 563 persons (weighted) with one or fewer LBFL available for analysis. Of 563 subjects with zero or one LBFL at baseline, 109 (19.4 %) experienced two or more LBFL at the 3-year follow-up. Baseline characteristics of the study population and factors associated with incident LBFL in univariate analysis have been described briefly in Table 1 and more extensively elsewhere (5). Briefly, persons who were older, unable to visit a doctor because of the cost, rated their health as fair/poor, scored nine or more on the CES-D 11-item scale, experienced greater number of severe chronic conditions, had one LBFL, had a higher score on the YPAS sitting index, and who lived in neighborhoods with 4–5 or 2–3 fair-poor conditions at baseline were more likely to report incident LBFL at the 3-year follow-up. Persons were less likely to have incident LBFL at follow-up when they had lived more than five years at the present address, were overweight, or walked more at baseline. Other variables that did not increase the risk of LBFL (i.e., $p \geq 0.15$ for the likelihood ratio test) in univariate analysis are not included in Table 1, including census-tract poverty rate and three subscales of the Yale Physical Activity Scale (vigorous activity, moving, standing).

There were 39 census tracts, with an average of 12.1 participants each (median: 9, range: 1–46). The *alpha index* varied across census tracts, with an average and median of 0.21 (minimum: 0.11, maximum: 0.33). Correlation between the *alpha index* and poverty rate was 0.56 (p=0.0002). Using quartiles of the *alpha index*, the average number of block face conditions rated as fair or poor did not vary for the three quartiles with the lowest connectivity (0.9 each). The average number of block face conditions rated as fair or poor was highest for census tracts with highest connectivity (2.6) (p<0.001). For perceived neighborhood conditions, the first three lowest connectivity quartiles were similar (9.6, 10.0, 10.1), but participants who lived in census tracts with the highest street connectivity rated their neighborhoods worse (12.2) (p<0.001). This pattern was true for the question about their neighborhood as a place to live, general feelings about the neighborhood, and neighborhood safety from crime, where those who lived in census tracts characterized by the highest street connectivity rated their neighborhood to be worse than those in the other three quartiles ($p<0.001$). There were no statistical differences in participant neighborhood attachment across census-tract street connectivity ($p=0.4074$). Table 2 shows that age, sex, employment, prevalence of LBFL, and BMI varied statistically across street connectivity in a nonlinear way. Household income was significantly lower among those living in census tracts with the highest connectivity, while the percentage with fair/poor self-rated health was highest in the highest connectivity quartile.

There was no association between street connectivity and incident LBFL in unadjusted analysis (Table 3). Next, we constructed a multivariable logistic model that adjusted for potential confounders, which showed that participants who lived in census tracts with lowest street connectivity had higher odds of developing incident LBFL than those who lived in the highest street connectivity census tracts (adjusted OR:3.45; 95% CI: 1.21, 9.78) (Table 4). Because this adjusted OR seemed to contradict the unadjusted OR, we examined each of the variables included in the adjusted model separately. We found that self-perceived health status and block face conditions were the reasons for the higher adjusted OR for street connectivity. The OR for the highest versus lowest street connectivity adjusted for self-perceived health status and block face conditions was 2.95 (95% CI: 1.14, 7.65). The reason for this positive confounding is that higher street connectivity was associated with worse self-perceived health and worse block face conditions, which were associated with higher LBFL incidence. Thus, adjusting for these two factors unmasked a positive association between connectivity and incident LBFL.

Sensitivity analyses showed that our findings were robust when limiting the analysis to 1) persons who resided in their neighborhood for at least 5 years, 2) persons who resided at the same address during the 3-year study period, and 3) persons without any LBFL at baseline. Also, using other measures of street connectivity demonstrated the same results as when using the *alpha index*. Correlations between the *alpha index* with average block length, average block size, and housing density were high, −0.79, −0.71, and 0.68, respectively.

DISCUSSION

Our adjusted analysis shows that African Americans who lived in census tracts with the lowest street connectivity had 3.45 times higher odds of developing LBFL as those who lived in areas with the highest quartile of connectivity. The adjusted results suggest a threshold effect of street connectivity for the lowest quartile. The reason for a lack of an unadjusted association was the presence of positive confounding by self-perceived health and block face conditions. Our findings are inconsistent with two previous studies, which did not find associations between street connectivity and risk of LBFL in adjusted analyses (7, 27). However, differences in study populations, our different measures of neighborhood design and conditions, examining only linear effects in other studies, and varying characteristics of the geographic areas may explain this in part. One explanation might be that our findings may only apply to the St. Louis area. In contrast to our urban study population, one previous study included both rural and urban populations across the United States (27) while the other included both rural and semi-urban populations (7).

A key issue in understanding the potential effects is the identification of the mechanisms by which street connectivity increases the risk of LBFL among African Americans. Advocates of New Urbanism and neo-traditional planning concepts include street connectivity as a key component for good neighborhood design. Street networks that are more grid-like are preferred over networks that include many cul-de-sacs and long blocks, which increase distances between destinations. While there could be several mechanisms at play, we had anticipated that the effect of street connectivity on LBFL incidence could be the result of less walking and higher body-mass index in these areas, but in our adjusted analysis, street connectivity exerted its effect over and above body-mass index and time spent sitting, suggesting that these are not mediators for the observed association. Time spent walking was not associated with incident LBFL in either univariate or multivariable analyses, suggesting that walking does not explain the relationship between connectivity and incident LBFL. However, a limitation of the YPAS is that it only inquired about instances where respondents walked at least ten minutes. Other publications have noted that although body-mass index was increased among whites living in neighborhoods with low street connectivity, this relationship may not be present among African Americans (21, 31). Collective efficacy and social capital also may act as mediators of the observed association because neighborhoods high in collective efficacy and social capital may provide more opportunities for persons through the assistance of neighbors or social activity and engagement (13, 23). While this may be present at the neighborhood level, in our study social support measured at the individual level was not associated with the development of LBFL, which suggests that aspects of the built environment do not exert their effects on disability through individual-level social support. Some have suggested that aspects of the built environment may produce psychological stress, which may interact with biological factors, leading to differences in stress-related disease and subsequent functional decline (27). The built environment may influence functioning through injury because areas with low street connectivity are less likely to have sidewalks and to separate pedestrians from traffic (46). Thus, our study shows that the design of neighborhoods, as measured by street connectivity, affects the risk of LBFL independently from neighborhood conditions as measured by block face conditions (5). Notably, the economic environment (poverty rate) did not play a role.

Our results are limited by unique characteristics of the AAH cohort, including analysis of a single race, living in a single metropolitan area with participants who are from a restricted age range, and relatively small sample size, all of which may limit generalizability. For example, average street connectivity in our study area (0.21) was slightly higher than in Los Angeles (0.16), San Diego (0.11), and across the United States (0.16) (27, 34). Limitations also involve possible migration of the study population into different neighborhoods between baseline and 3-year follow-up. This possibility is unlikely to have affected our findings because the observed association appeared to be similar when the analysis was limited to persons who lived for more than five years at the same address before their baseline interview and among those who resided at the same address at both data collection points. Similarly, it could be argued that persons who initially have health problems subsequently live in neighborhoods with adverse conditions because they lack the money and the physical ability to improve their living conditions. However, an association remained when limiting the population to those who did not move during the study period, thereby providing little evidence for reverse causation. Although unmeasured confounding may have played a role, we have included the vast majority of risk factors for LBFL, thereby reducing its likelihood (38).

In conclusion, middle-aged African Americans who lived in census tracts characterized by lower street connectivity were more likely to experience LBFL three years later independently of block face conditions and individual-level risk factors such as physical activity and body mass index. Our findings highlight the need for attention to and understanding of the design of the built environment to decline in physical functioning among middle-aged African Americans.

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List of abbreviations and acronyms

LBFL	Lower body functional limitations

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Table 1

Prevalence of selected characteristics at baseline and unadjusted risk of incident lower body functional limitation with p-value for the likelihood ratio test <0.15 for participants in the African-American Health study.

		Unadjusted risk of incident lower body functional limitation at 3-year follow-up.	
	Prevalence at baseline (%)(weighted n=563)	**Odds ratio**	**95% CI**
Socio-demographics			
Length of time at present address			
More than 5 yrs vs. Less than 5 years	73.1	0.53	0.34 – 0.82
Age (mean[s.d.])	56.1 (4.7)	1.06	1.01 – 1.11
Gender: Women vs. Men	54.6	1.46	0.95 – 2.24
Objective income			
<$20,000 vs. >=$50,000	17.4	1.68	0.95 – 2.94
$20,000 – < $50,000 vs. >=$50,000	48.8	1.32	0.29 – 6.07
Employment: Employed vs. Unemployed	74.2	0.64	0.43 – 1.07
Health insurance at or 12 months before interview			
No vs. Yes	17.1	1.52	0.91 – 2.55
Unable to visit doctor due to cost (Yes vs. No)	6.4	2.35	1.14 – 4.83
Health status and behavior			
Self-perceived health status			
Fair/poor vs. Good/very good/excellent health	20.0	2.64	1.66 – 4.22
CES-D >=9 of 11: Yes vs. No	12.5	1.89	1.08 – 3.32
No. of severe chronic conditions (per condition)	0.8 (1.0)	1.56	1.28 – 1.90
One lower body limitation: Yes vs. No	29.2	3.56	2.30 – 5.49
Body Mass Index			
>=30.0 vs. <25.0	35.5	0.61	0.36 – 1.04
25.0 – 29.9 vs. <25.0	40.7	0.48	0.28 – 0.81
Leisurely walking index (mean [s.d.]) - YPAS	10.4 (11.4)	0.98	0.96 – 1.00
Sitting index (mean [s.d.]) - YPAS	2.1 (1.0)	1.25	1.01 – 1.55
Multiple, observed neighborhood conditions			
2–3 conditions vs. 0–1 conditions rated as fair-poor	15.2	1.90	1.09 – 3.32
4–5 conditions vs. 0–1 conditions rated as fair-poor	14.0	2.65	1.54 – 4.57

*[CI denotes confidence interval, s.d. denotes standard deviation,] CES-D denotes Centers for Epidemiological Studies – Depression Scale, YPAS denotes the Yale Physical Activity Scale.

Table 2

Prevalence of selected characteristics at baseline and association with street connectivity for participants in the African-American Health study (n=563).

	Census tract street connectivity quartile			
	1 (lowest connectivity) N=203	2 N=199	3 N=92	4 (highest connectivity) n=69
Socio-demographics				
Length of time at present address				
More than 5 yrs vs. Less than 5 years	72.9	74.6	70.0	74.7
Age (mean[s.d.]) **	56.8 (5.8)	55.3 (5.0)	55.9 (4.0)	56.7 (3.5)
Gender: Women **	46.7	67.5	49.4	47.2
Objective income **				
<$20,000	16.6	10.7	17.5	39.2
$20,000 – < $50,000	56.2	43.3	47.1	44.9
>=$50,000	25.6	41.8	31.7	13.3
Unknown	1.7	4.2	3.7	2.6
Employment: Employed **	76.1	71.0	83.7	65.6
No health insurance at or 12 months before interview	15.3	14.8	22.6	21.5
Unable to visit doctor due to cost	8.2	3.5	7.7	7.9
Health status and behavior				
Fair/poor self-perceived health status **	16.2	17.2	23.8	34.5
CES-D >=9 of 11	12.5	11.3	15.6	12.1
No. of severe chronic conditions (mean[s.d.])	0.9 (1.3)	0.9 (1.2)	0.7 (0.8)	0.8 (0.7)
One lower body limitation **	36.8	19.5	26.8	32.3
Body Mass Index *				
<25.0	18.8	20.3	32.8	30.1
25.0 – 29.9	41.9	45.5	31.0	39.7
>=30.0	39.3	34.3	36.3	30.2
Leisurely walking index (mean [s.d.]) - YPAS	10.9 (13.7)	9.9 (14.6)	10.8 (7.9)	9.8 (7.7)
Sitting index (mean [s.d.]) - YPAS	2.1 (1.2)	2.1 (1.2)	2.0 (0.9)	2.0 (0.7)
Multiple, observed neighborhood conditions **				
0–1 conditions rated as fair-poor	78.6	75.2	77.3	26.9
2–3 conditions rated as fair-poor	5.0	14.4	18.4	43.3
4–5 conditions rated as fair-poor	16.4	10.4	4.3	29.9

* p<0.15;

** p<0.05

Table 3

Unadjusted between quartiles of street connectivity (alpha index) and incident lower-body functional limitations.

Census tract street connectivity quartile	Number of census tracts	Number of weighted participants	Incident lower-body functional limitations (%)	Unadjusted odds ratio (95% confidence interval)
1 (lowest connectivity)	10	203	24.4	1.49 (0.60; 3.71)
2	9	199	15.3	0.81 (0.32; 2.06)
3	11	92	17.6	0.91 (0.33; 2.47)
4 (highest connectivity)	9	69	18.6	1.00

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Table 4

Multivariable model predicting incident lower-body functional limitations.

Characteristic	Adjusted odds ratio (95% confidence interval)
Census tract street connectivity quartile	
1 (lowest connectivity) vs. 4 (highest connectivity)	3.45 (1.21; 9.78)
2 vs. 4 (highest connectivity)	1.97 (0.69; 5.59)
3 vs. 4 (highest connectivity)	1.85 (0.61; 5.65)
One lower body limitation: Yes vs. No	2.80 (1.69; 4.66)
Block face conditions	
2–3 conditions vs. 0–1 conditions rated as fair-poor	3.18 (1.49; 6.82)
4–5 conditions vs. 0–1 conditions rated as fair-poor	3.52 (1.67; 7.43)
Health insurance at or 12 months before interview: No vs. Yes	2.07 (1.10; 1.50)
Self-perceived health status: Fair/poor vs. Good/very good/excellent health	2.07 (1.16; 3.72)
CES-D >=9 of 11: Yes vs. No	1.39 (0.71; 2.73)
No. of severe chronic conditions (per condition)	1.49 (1.15; 1.92)
Body Mass Index	
>=30.0 vs. <25.0	2.78 (1.47; 5.27)
25.0 – 29.9 vs. <25.0	1.23 (0.69; 2.22)
Sitting index - YPAS (per point)	1.37 (1.07; 1.76)