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Research Article

Recovery From Mobility Limitation in Middle-Aged African Americans: The Jackson Heart Study

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Abstract

Background: Despite evidence that African Americans shoulder a high burden of mobility limitation, little is known about factors associated with recovery.

Method: Participants from the Jackson Heart Study underwent 3 in-person exams from 2000 to 2013. Mobility limitations were assessed over this period by self-reported limitations in walking half a mile or climbing stairs during annual phone calls. The outcome of interest, recovery from mobility limitation, was defined as no mobility limitation the year following an incident event. Candidate predictor variables were assessed in logistic regression models, including sociodemographic, psychosocial, and health measures. Inverse probability weights were used to address missing data in the outcome.

Results: Among 4526 participants (mean [*SD*] age = 54.5 (12.8) years) without a mobility limitation at baseline, 1445 (32%) had an incident mobility limitation over 12 years of follow-up, and 709 (49%) reported recovery from mobility limitation by 1 year later. Low income and daily discrimination were associated with a lower likelihood of recovery even after adjustment for covariates. In adjusted models, greater comorbidity was associated with a lower likelihood of recovering (*p*-value for trend = .05). History of heart failure and cancer were associated with a lower likelihood of recovering from mobility limitation (OR: 0.52, 95% CI: 0.29, 0.94 and OR: 0.74, 95% CI: 0.55, 1.00). Adiposity, smoking status, and physical activity were not associated with recovery from mobility limitation.

Conclusion. Half of incident mobility limitations in this population of middle-aged African Americans were transient. Adverse sociodemographic factors and comorbidities were associated with lower likelihood of recovery.

Keywords: Minority health, Mobility limitation, Recovery

African Americans have a higher burden of disability than their White counterparts (1–3). In high functioning African American and White older adults participating in the Health, Aging, and Body Composition Study, African American adults had slower walking speed than White adults, and were more likely to develop incident mobility disability (1). In the Cardiovascular Health Study (CHS), African Americans were found to have higher rates of mobility difficulty and limitations on activities of daily living (ADLs) and instrumental activities of daily living (IADLs) than Whites (2). In the Medicare Current Beneficiaries Surveys, African Americans reported more limitations in mobility, ADLs, and IADLs than any other racial/ethnic group (3). The reasons for the higher burden of disability among African Americans are unclear but warrant better understanding to enable the development of evidence-based interventions to ameliorate this disparity.

The origins of functional loss begin in mid-life, when adults frequently transition in and out of functional limitation. For example, a middle-aged adult may be able to recover from a joint injury,

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whereas the same injury in an older adult may cascade into disability. Persistent disability, which tends to accumulate in later life, can lead to reduced quality of life, inability to work, hospitalization, loss of independence, and death (4–6). Functional impairment also often leads to reduced physical activity, which can exacerbate functional decline and other comorbid conditions such as obesity, diabetes, arthritis, and cardiovascular disease. Despite the well-developed literature on the prevalence of poor function (1,2,7), there remains a paucity of research on recovery from functional impairment.

The Jackson Heart Study (JHS) represents a unique opportunity to examine recovery from limitations in mobility in a mid-life sample of African Americans in the Southern United States. In this study, we examine the occurrence of mobility limitation, the probability of recovery from incident mobility limitations, as well as factors associated with recovery from limitations. Due to the limited data on determinants of recovery in functional limitations, we include predictors in multiple domains—sociodemographic, health measures and behaviors, chronic conditions, and psychosocial factors—as possible protective factors for functional recovery. The goal of this study was to conduct a descriptive investigation and to identify potential pathways for further study with the long-term goal of identifying modifiable risk factors.

Method

The JHS is a community-based cohort study of African Americans in Jackson, MS, designed to investigate causes of cardiovascular disease; details of the study design have been published (8). JHS recruited 5306 African Americans aged 21 years and older, living in the tri-county (Hinds, Madison, and Rankin) area of the Jackson, MS, metropolitan area. Participants included former participants in the Atherosclerosis Risk in Communities Study (31%), secondary family members of existing participants (22%), volunteers (30%), and a random selection from the Mississippi Driver's License and Identification List (17%). The main study outcomes include clinical as well as subclinical manifestations of coronary disease and overall mortality. Three in-person examinations were conducted from 2000 to 2013, which included questionnaires, interviews, biospecimen collection, and physical exam. During annual follow-up telephone calls, study personnel asked participants about health status and cardiovascular events. There were 5272 (99.3%) of participants with annual telephone follow-up data. The present study included data from baseline and over 12 years of follow-up. The study was approved by the institutional review boards of the University of Mississippi Medical Center, Jackson State University, and Tougaloo College. All participants provided informed consent.

At the annual follow-up calls, participants were asked the following questions about mobility limitations: "Are you able to walk up and down stairs without help?" and "Are you able to walk half a mile without help?" Participants could respond "yes" or "no." Those who responded "no" to either of these questions were identified as having a prevalent mobility limitation. An incident mobility limitation was defined as a new report of a prevalent mobility limitation in a person who did not report prevalent mobility limitation on any previous call. Participants with prevalent mobility limitation at baseline were excluded (n = 746); the analytic sample was 4526. Recovery of mobility limitation was defined as a report of no prevalent mobility limitation among persons with an incident mobility limitation in the previous year. If information on recovery was missing, information from the next annual follow-up was used. If 2 or more follow-up assessments were missing (n = 425), the individual was classified as "not recovered." Participants who died in the year following an incident mobility limitation (n = 19) were classified as "not recovered." As an alternative approach, we used inverse probability weighting to account for the missing data in the outcome.

The following variables were assessed at the 3 in-person visits from 2000 to 2013, unless otherwise noted. Age, gender, and education (less than high school, high school diploma or GED, or attended trade school, vocational school, or college), marital status (defined as married vs single/divorced/widowed; first visit only), and insurance (any vs none) were self-reported. Income status was derived from family size and calendar-year-specific poverty level based on self-reported income ("lower," "lower-middle," "higher-middle," and "affluent"). Self-reported smoking was categorized based on American Heart Association (AHA) criteria: "poor" (current smokers), "intermediate" (quit < 12 months ago), and "ideal" (quit 12 months or more ago or never). Self-reported physical activity was assessed using the JHS Physical Activity Form (9), and categorized according to the AHA recommendations; participants who engaged in at least 75 minutes or more per week of vigorous physical activity, or 150 minutes or more of moderate or combined moderate/vigorous physical activity were categorized as "ideal," those who engaged in 1–74 minutes per week of vigorous physical activity, or 1–149 minutes of moderate or combined moderate/vigorous physical activity were categorized as "intermediate," and those engaging in no leisure-time physical activity were categorized as "poor." Perceived discrimination was assessed by the everyday subscale of the JHS Discrimination Instrument (range 1–7) at the first visit (10). Depressive symptoms were assessed by the 20-item Center for Epidemiological Studies-Depression (CES-D) questionnaire (range 0–60) (11). Stress was assessed by the Perceived Stress Scale (12). We assessed social support at the first visit using an adapted Berkman Social Network Index to measure social support from current partners, friends, relatives, and social groups (range 0–5) (13).

Participants were weighed wearing light clothing and with shoes removed. Body mass index (BMI) was calculated as weight (kg)/height $(m)^2$. Waist circumference to the nearest centimeter was taken at umbilicus level with anthropometric tape. Waist-to-height ratio was calculated by dividing the waist circumference in centimeters by height in centimeters. Systolic and diastolic blood pressure were derived from the mean of 2 sitting Hawksley random zero sphygmomanometer readings, separated by 1 minute. The blood pressure measurements in JHS were calibrated to an oscillometric device using robust regression as described previously (14). Hypertension was defined as a blood pressure >140/90 mm Hg or self-reported use of antihypertensive medications. Fasting plasma glucose levels were measured on participants using a Vitros 950 or 250, Ortho-Clinical Diagnostics analyzer (Raritan, NJ). A high-performance liquid chromatography system (Tosoh Corporation, Tokyo, Japan) that was DCCT-aligned using NGSP guidelines was used to measure glycosylated hemoglobin A1c (HbA1c). Diabetes was defined as fasting blood glucose ≥126 mg/dL, HbA1c ≥6.5%, or use of glucose-lowering medications. Lipid panel readings provided fasting high- (HDL) and low-density lipoprotein (LDL) cholesterol as well as triglycerides. Renal function was derived from the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) creatinine equation for estimated glomerular filtration rate (eGFR), that takes into account sex, race, and age. There was continuous surveillance for myocardial infarction (MI), stroke, cardiac procedures, and heart failure events; these were adjudicated based on medical records

for hospitalizations. History of asthma, lung disease, or cancer was assessed annually on phone calls by self-report. Dialysis history was assessed at the in-person visits by self-report. Current medication status was confirmed by participants bringing in prescriptions and/or self-reported taking each of the following classes of medication within the 2 weeks preceding the exam: hormone replacement therapy, antiarrhythmic, antihypertensive, statin, and diabetes management. Comorbidity count was updated annually and categorized as 0, 1, 2, and 3+ of the following conditions: diabetes, hypertension, asthma, lung disease, cancer, MI, stroke, and dialysis.

Statistical Analysis

We first described the baseline characteristics of participants who did and did not have an incident mobility limitation event over 12 years of follow-up. We tested for differences in means for continuous variables using a *t* test or nonparametric equivalent, and in frequency distributions for categorical variables using Pearson's chi-squared test.

We described the incident rate of mobility limitation by gender and age (<50 years, 50–64 years, 65+ years).

We fit a series of multivariable logistic regression models to evaluate the association of the independent variables with recovery from incident mobility limitation within 1 year in the 1445 participants with incident limitations. Independent variables were assessed at the closest preceding visit to the incident mobility limitation report. We forced in age, gender, education, and income into the models. Income was collapsed into low and lower-middle income versus middle-high and high because the point estimates were similar in the upper 2 categories. Education was dichotomized as less than high school/GED versus high school/GED attainment and beyond. We then tested other independent variables for associations with recovery in models adjusted for these 4 demographic variables, and retaining any variable with a *p*-value <.10 using backwards selection. The first model evaluated other sociodemographic and psychosocial factors: insurance status, marital status, discrimination, depression, stress, and social support. The second model evaluated health measures and behaviors: BMI, waist-to-height ratio, smoking status, and physical activity. Waist-to-height ratio, smoking status, and physical activity were not associated with recovery below the <0.10 threshold in the demographic-adjusted model, but were evaluated subsequently because of the strong plausibility of an association with physical function. The third model evaluated physiologic measures, chronic conditions, and medications: eGFR, blood pressure, fasting glucose, cholesterol, asthma, stroke, MI, cardiac procedures, heart failure, chronic lung disease, cancer, blood pressure medications, diabetes medications, statins antiarrhythmic medications, and hormone replacement therapy. We also evaluated a fourth model evaluating the number of comorbidities instead of the individual chronic health conditions.

As a sensitivity analysis, we incorporated inverse probability of censoring weights to account for missingness in the mobility limitation as well as censoring due to death. We fit 2 models to account for censoring processes. The first model accounted for those who died or were lost to follow-up over the 12 years of this study. The second model includes participants who had an incident mobility limitation, but no assessment the following years. Both models included all predictor variables that were associated with the outcome at the *p* <.1 level. All analyses were performed using Stata 15.1 (StataCorp, College Station, TX).

Results

Out of 4526 participants without prevalent mobility limitation at baseline, 1445 had an incident mobility limitation during 12 years of follow-up (median: 12 years; range: 2–12 years). Participants who had an incident mobility limitation were, on average, older, less well educated, and had greater social support (Table 1). They also had lower systolic and diastolic blood pressure and eGFR levels, as well as a greater history of cancer, and they were more likely to be taking medication for blood pressure, diabetes, and cholesterol (statins).

The incidence rate for mobility limitation was 35 per 1000 person-years. The incidence rate increased with age among women and men (Table 2). Of the 1445 incident events, 705 (49%) recovered from mobility limitation within 1 year.

Of the sociodemographic and psychosocial factors evaluated, only income and daily discrimination were associated with recovery from mobility limitation. Persons with low or low-middle income had an OR of 0.74 (95% CI: 0.59, 0.94) compared with those reporting middle-high or high income. Each additional point on the daily discrimination scale (range: 1–7) was associated with a 0.90 odds of recovery (95% CI: 0.81, 1.00). Waist-to-height ratio, smoking, and physical activity were not associated with the probability of recovering from mobility limitation (Table 3). Higher hemoglobin A1c was associated with a greater likelihood of recovery (OR: 1.16, 95% CI: 1.04, 1.30). History of heart failure and cancer were associated with a lower likelihood of recovering from mobility limitation (OR: 0.52, 95% CI: 0.29, 0.94 and 0.74, 95% CI: 0.55, 1.00). In an alternative adjusted model, the number of comorbidities was associated with lower likelihood of recovery (Figure 1, *p*-value for trend = .05).

Findings were largely similar when using inverse probability weighting to account for missing data in the outcome (Supplementary Table). The estimate for the association between daily discrimination and recovery from mobility limitation was no longer statistically significant, and the estimate for heart failure was unstable and not reported.

Discussion

In this study of middle-aged African American adults, one-third developed an incident mobility limitation over 12 years; and among those with incident limitations, over half reported no limitation in the following year. This exploratory research identified several potential risk and protective factors for recovery, with the goal of providing hypothesis-generating results to be explored in future research. Among the sociodemographic factors, lower income and experiences of daily discrimination were associated with a lower odds of recovering from incident mobility limitation in 1 year. Chronic health conditions were the strongest determinants of recovery after an incident limitation and a greater number of conditions was associated with lower likelihood of recovery. In fully adjusted models, higher hemoglobin A1c was paradoxically associated with greater likelihood of recovery, whereas history of heart failure and cancer were associated with lower likelihood of recovery.

The majority of research on mobility limitation and disability has focused on incident events; few studies have focused on recovery. A prior study from the Established Populations for

Table 1. Baseline Population Characteristics by Incident Mobility Limitation

	Incident Mobility Limitation	Did Not Have Incident Mobility Limitation	*p*-Value
	N = 1445	*N* = 3081	
	Mean (*SD*) or %		
Age, years	56.6 (12.7)	53.6 (12.8)	<.001
Gender, women, %	64.3	62.2	.18
Education, %			.002
Less than high school	22.6	18.6	
High school graduate/GED	18.6	17.8	
Some postsecondary	58.8	63.6	
Married, %	56.5	54.1	.14
Health insurance, %	86.6	85.9	.47
Income, %			.14
Low	15.3	16.0	
Lower-middle	25.6	22.8	
Upper-middle	30.0	29.7	
High	29.1	31.5	
Daily discrimination (1–5)	2.1 (1.0)	2.1 (1.0)	.39
Depressive symptom (0–60)	11.1 (7.8)	10.9 (8.2)	.52
Social support (1–5)	4.23 (0.85)	4.18 (0.85)	.05
Smoking, %			
Ideal	85.9	85.3	.67
Intermediate	1.1	1.3	
Poor	13.0	13.4	
Physical activity, %			
Ideal	17.7	20.0	.06
Intermediate	30.9	31.8	
Poor	51.3	48.3	
SBP, mm Hg	128 (16)	127 (17)	.02
DBP, mm Hg	75 (9)	76 (9)	.01
BMI, kg/m^2	31.9 (0.2)	31.7 (0.1)	.38
Waist:height ratio	0.60 (0.10)	0.59 (0.10)	.11
Glucose, mg/dL	101 (32)	100 (36)	.56
eGFR, mL/min/1.73m^2	93.2 (21.7)	95.7 (21.9)	<.001
Physician-diagnosed asthma, %	5.1	5.8	.63
Chronic lung disease history, %	5.4	3.6	.01
Cancer history, %	6.4	3.0	<.001
MI history%	5.1	4.8	.72
Stroke history, %	4.7	3.7	.12
Coronary heart disease history, %	6.9	6.9	.96
Cardiovascular disease history, %	10.5	9.5	.30
Heart failure history, %	0.1	0.0	**
BP medications, %	55.4	49.0	<.001
Diabetic medications, %	17.4	14.8	.005
Statins medications, %	15.9	12.2	.001
Arrhythmic medication, %	4.6	3.6	.08

Note: BMI = body mass index; BP = blood pressure; eGFR = estimated glomerular filtration rate; DBP = diastolic blood pressure; MI = myocardial infarction; SBP = systolic blood pressure; ** = not applicable. *p*-Values were calculated using a *t* test for continuous variables and chi-squared tests for categorical variables.

Epidemiologic Studies of the Elderly Study evaluated transitions in limitation in ADLs in 2 sites: New Haven, Connecticut and North Carolina. The authors found that about 20% recovered within 1 year and this did not vary by race (15). Factors associated with recovery varied by site: age and poor cognitive function were associated with lower odds of recovery at both sites, whereas higher education and lower income were associated with recovery in New Haven participants and number of chronic illness was associated with recovery in North Carolina participants. A 2004 study in the Precipitating Events Project (PEP) found that persons who were cognitively impaired, physically frail, or had severe disability were less likely to recover in this 90% White population (16). A recent analysis in the Health and Retirement Study (HRS) (9% African American) evaluated transitions in ADLs among middle-aged adults in the United States (17). They found that impairment in 1 or more ADLs occurred in 22% of participants aged 50–64 years, but only 37% recovered independence within 2 years. Our findings suggest much higher proportion recovering in this population of middle-aged African Americans, although it should be noted that an ADL impairment is a more severe functional impairment compared with mobility limitation (18). Thus, the lower recovery proportions may have been due to the severity of the impairment. It is also important to note that JHS participants were younger than the participants in these other studies, and the mean age of those with incident mobility

Table 2. Incident Mobility Limitation by Age and Gender

	Female		Male	
Age	*N*	Incident Rate per 1000 Person-Years	*N*	Incident Rate per 1000 Person-Years
<50	1045	29.2	660	27.2
50–64	1124	36.8	652	33.2
>65	652	46.0	360	47.8

Table 3. Models of Recovery From Incident Mobility Limitation Within 1 Year

	Model 1		Model 2		Model 3	
	OR (95% CI)	*p*-Value	OR (95% CI)	*p*-Value	OR (95% CI)	*p*-Value
Age (per 10 y)	0.96 (0.87, 1.05)	.35	0.95 (0.87, 1.05)	.31	0.97 (0.88, 1.06)	.49
Male gender	1.15 (0.92, 1.44)	.23	1.13 (0.90, 1.42)	.29	1.12 (0.89, 1.40)	.34
High school education	0.83 (0.62, 1.11)	.21	0.84 (0.62, 1.12)	.23	0.82 (0.61, 1.10)	.19
Low income	0.74 (0.59, 0.94)	.01	0.73 (0.58, 0.93)	.009	0.76 (0.60, 0.96)	.02
Daily discrimination	0.90 (0.81, 1.00)	.05	0.90 (0.80, 1.00)	.05	0.90 (0.81, 1.00)	.05
Waist:height ratio	*	*	0.84 (0.27, 2.60)	.76	*	*
Smoking (ref: never)						
Former	*	*	0.38 (0.11, 1.26)	.11	*	*
Current	*	*	0.90 (0.65, 1.25)	.52	*	*
Physical activity (ref: ideal)						
Intermediate	*	*	0.93 (0.72, 1.19)	.56	*	*
Poor	*	*	0.89 (0.66, 1.19)	.42	*	*
Hemoglobin A1c (%)	*	*	*	*	1.16 (1.04, 1.30)	.006
History of heart failure	*	*	*	*	0.53 (0.28, 0.98)	.04
History of cancer	*	*	*	*	0.66 (0.54, 1.04)	.006
Diabetes medications	*	*	*	*	0.75 (0.54, 1.04)	.08

Note: * = not applicable

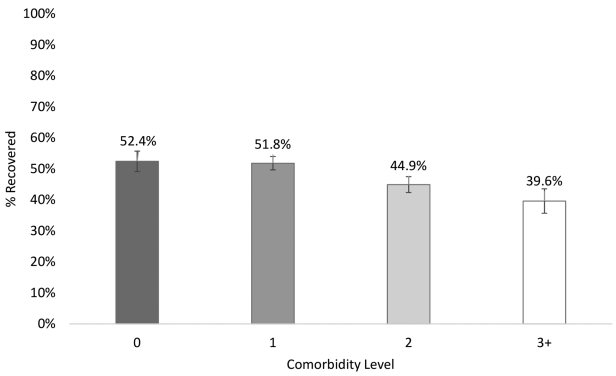

Figure 1. Proportion recovering from incident mobility limitation within 1 year, across level of comorbidity. *p*-Value for trend = .007.

limitation was 57 years. Nonetheless, the comparison with our estimates highlights the high likelihood of recovery in the present study. Our study suggests that many new limitations in our population are transient, thus factors that promote recover could help prevent or delay progression into persistent mobility limitation. Previous literature has demonstrated that shorter duration of impairment has been identified as a predictor of regained independence (19).

The association between income and disability is well described (20), with some studies demonstrating that socioeconomic status may partially account for racial disparities in function (21,22). Our study extends this research by focusing on recovery. Persons with more financial resources may be able to leverage resources that aid recovery such as physical therapy, assistive walking devices, and time away from physically taxing job. Our work also contributes to the body of literature demonstrating the detrimental effects of discrimination on later life health by extending these effects to include physical function. Discrimination can produce adverse health effects through a variety of mechanisms including depressive symptoms and obesity (23–25). These risk factors can subsequently affect the likelihood of recovery, although these more proximal factors were not associated with recovery in the present study. We hypothesize that experiences of discrimination may have a detrimental effect on function through these multiple pathways, and that the pathways may vary greatly from person-to-person.

We found that history of heart failure had half the odds of recovery of someone without heart failure, thus persons at high risk for cardiovascular outcomes may also be at risk for persistent mobility limitation. Previous investigations have demonstrated that cardiovascular disease and its risk factors are risk factors for disability (26–28). African Americans suffer from a disproportion burden of heart failure and related morbidity, which likely contributes to the excessive burden disability in this population. One study found that higher prevalence of obesity and diabetes mellitus in older African Americans accounted for over 30% of the racial disparity in disability, even after controlling for SES differences (29). However, less research has examined recovery from limitations. Some literature demonstrates that chronic conditions, including cardiovascular disease, have been associated with reduced functional recovery (30,31). The finding that higher hemoglobin A1c is associated with greater

likelihood of recovery is intriguing, and deserves further exploration. The American Geriatric Society recommends higher hemoglobin A1c targets among older adults with multiple comorbidities, poor health, and limited life expectancy (32). It is possible that overtreatment for diabetes could result in hypoglycemic episodes and other potential harms that may reduce the likelihood of recovering from a mobility limitation. It is also possible that this could be a chance finding, because of the multiple comparisons in this paper.

We also found that history of cancer is associated with a lower likelihood of recovery from mobility limitation. Poor function status among cancer survivors is well described, and our work extends this to evaluate recovery from functional limitations (33,34). In our study, persons with a greater level of comorbidity, or number of chronic conditions, were less likely to recover from an incident mobility limitation in 1 year. Previous research have found that comorbidity is a strong determinant of frailty and disability (35). Thorpe et al. found that comorbidity was associated with mobility limitation in African Americans in the Baltimore Study of Black Aging (7). The mediating pathways of comorbidity on likelihood of recovery, such as polypharmacy and risk of hospitalization, deserve future study.

It is notable that we did not find associations between well-established risk factors for poor physical function, including adiposity, smoking, and physical activity, and recovery from mobility limitation. The average BMI of JHS participants was in the obese range and half of JHS participants engaged in no physical activity, so it may be possible that the range of adiposity and physical activity did not meet sufficient levels to exert a protective effect. Additionally, smoking can have paradoxical associations with health outcomes in aging adults, as often those who survive and are able to continue smoking may have other protective health factors that confound any relationship between current smoking and outcomes. We consider the possibilities that measurement error and unmeasured confounding could have masked potential associations between these risk factors and recovery from mobility limitation, or that different assessment tools may have led to heterogeneity in findings.

Strengths of this study include the focus on recovery from mobility limitations, the inclusion of an understudied population, and the well-characterized study population. Our study has limitations that should be considered. The primary limitation is the wide range of statistical tests in this investigation. We took an exploratory approach to evaluating risk and protective factors, and this study should be interpreted as hypothesis-generating for future research. Mobility limitations were assessed by self-report rather than objective measures of function, which may result in misclassification and contribute to measurement error and biased estimates. However, mobility limitations are commonly assessed via self-report, and this measure is a strong predictor of outcomes (36). In addition, our study had a degree of missing data in the mobility limitation measures; however, the use of inverse probability weighting did not appear to have an important effect on our estimates. Therefore, the missingness does not appear to be strongly informative in this population, although we could be limited by misspecification of the missing data models. Although JHS is a large cohort study, the fact that we restricted our sample to only those with incident mobility limitation (n = 1445) limited the sample size and many of the associations were estimated with poor precision. Surprisingly, several factors that have previously demonstrated to be important determinants of functional status (depression, obesity, physical activity) were not associated with recovery from functional limitation. This may be due to a true lack of association with recovery in this population, or it could be due to residual bias in our study due to measurement error, missing data, or residual confounding. Finally, the JHS is a community-based sample of African Americans in the Jackson metropolitan area, and these findings may not apply to African Americans in other geographic areas.

In conclusion, middle-aged African Americans have a high rate of both incident mobility limitation and recovery. The present study provides important evidence of the transience of mobility limitation among middle-aged African Americans, highlighting the importance of preserving function in this population. Differences in income, experience of discrimination, and chronic health conditions are associated with the likelihood of recovery, and all represent high-priority pathways to explore in future hypothesis-driven work. More research is needed on transitions in functional status among diverse communities in order to inform interventions that preserve function and reduce disparities.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences* online.

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Conflict of Interest

M.C.O. is a paid consultant for Cricket Health Inc., a kidney care company. All other authors declare no conflict of interest.

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