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RESEARCH ARTICLE

Daily Walking and Mortality in Racially and Socioeconomically Diverse U.S. Adults

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Introduction: While the health benefits of daily walking are well-established, limited research has investigated effects of factors such as walking pace on mortality, particularly in low-income and Black/African-American populations.

Methods: Data from the Southern Community Cohort Study were used, including information from nearly 85,000 predominantly low-income and Black individuals recruited during 2002−2009 across 12 southeastern U.S. states. Participants provided baseline information on daily walking pace and time, demographic information, lifestyle factors, and health status. Mortality data were collected until December 31, 2022. Analysis was conducted from September 2023 to June 2024.

Results: Over a median follow-up of 16.7 (2.0−20.8) years, 26,862 deaths occurred. Significant associations were found between all-cause mortality and daily fast walking time. Fast walking as little as 15 minutes a day was associated a nearly 20% reduction in total mortality (hazard ratios=0.81; 95% CI=0.75, 0.87), while only a 4% reduction in mortality (hazard ratios=0.96; 95% CI=0.91, 1.00) was found in association with more than 3 hours of daily slow walking. Fast walking was independently associated with reduced mortality, regardless of the leisure-time physical activity levels. The inverse association was more pronounced for mortality due to cardiovascular diseases than cancers. Participants with baseline comorbidities had larger risk reductions compared to their generally healthy counterparts, although all individuals benefited from fast walking.

Conclusions: Regular walking, particularly fast walking, was associated with reduced mortality. These findings underscore the importance of promoting fast walking as a feasible and effective strategy to improve health outcomes and address health disparities among low socioeconomic populations.
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INTRODUCTION

Regular walking is widely recognized for its significant benefits on overall health and well-being.[1−3] Extensive research has examined various dimensions of walking behaviors, including walking pace,[4,5] step count,[6,7] and weekly frequency,[8] all of which consistently demonstrate strong associations with mortality. Moderate intensity or brisk walking has been associated with reduced mortality and is therefore included in the American Heart Association recommendations for physical activity. Several previous studies suggested that replacing sitting behaviors with light-intensity walking may reduce the levels of postprandial insulin and glucose[9,10] and improve vascular-inflammatory markers (TNF-α, IL-1β, PAI-1, and fibrinogen) among patients with type 1 diabetes.[11] A recent randomized crossover trial reported that light-intensity walking could reduce the diastolic blood pressure among young obese adults.[12] A recent study found that >1.5 hours of daily light-intensity physical activities was significantly associated

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with a 30% reduction in mortality among older adults; however, this study did not specifically evaluate light-intensity walking.[13] Furthermore, a recent meta-analysis found no significant effects of either standing interruptions or light-intensity walking on blood pressure reduction,[10] Given inconsistent results from previous studies, additional research is needed to investigate whether light-intensity walking may reduce mortality.

Existing literature on walking and other leisure-time physical activity (LTPA) primarily focuses on middle-to-high-income white populations,[2,4] lacking representation of low-income, particularly low-income Black, individuals. Walking behaviors may differ significantly between individuals from low-income and higher-income backgrounds.[14] Low-income populations often face economic constraints and are more likely to reside in impoverished, highly polluted communities with limited access to safe walking spaces.[15,16] Additionally, these populations tend to have a higher prevalence of lifestyle behaviors that may increase disease risk and mortality, such as lower quality diet, cigarette smoking, and heavy alcohol consumption.[17,18] At the same time, there are other challenges for individuals with low income such as lack of access to health insurance or health care that may also increase mortality.[19] These factors collectively contribute to an increased mortality within low-income individuals and may potentially elucidate the racial disparities observed in longevity.[20] Few studies, especially those with large sample sizes and long-term follow-up, have adequately assessed the association between daily walking and mortality outcomes in racial/ethnic minority populations in the U.S. disproportionately affected by low income.

To bridge this research gap, data from the Southern Community Cohort Study (SCCS) were used to investigate the association between daily walking and overall/cause-specific mortality, while also exploring potential modifying effects of behavioral risk factors. The SCCS is a large prospective cohort study designed to investigate the determinants of racial disparities in cancer and other chronic diseases among underserved populations in the U.S.[21] Notably, more than half of the study participants reported an annual income of less than $15,000 at enrollment, with approximately two-thirds of the cohort consisting of Black participants. This unique cohort provides an exceptional opportunity to evaluate the association between daily walking and mortality within a racially diverse low-income population.

METHODS

Study Population

The SCCS was described in detail previously.[21] In brief, the study enrolled approximately 85,000 participants aged 40−79 years during 2002−2009 who had not undergone cancer treatment within 1 year prior to the study baseline. The majority of participants (86%) were recruited in collaboration with community health centers (CHCs) serving low-income populations across 12 southeastern states. The remaining 14% of participants were recruited through stratified random sampling from residents within the same 12 states. Baseline data, including daily walking, sociodemographic and lifestyle factors, and medical history, were collected using structured questionnaires. The SCCS was approved by institutional review boards at Vanderbilt University Medical Center and Meharry Medical College, and all participants provided written informed consent. For the current analysis, participants who died within the first 2 years after completing the baseline survey to reduce potential bias due to reverse causality (n=1,867) or with missing values for daily walking (n=3,072) were excluded, leading to a final study sample of 79,856.

Measures

During the baseline survey, participants reported the average amount of time per day (minutes) they typically spend *walking slowly (such as moving around, walking at work, walking the dog, or engaging in light exercise)* and *walking fast (such as climbing stairs, brisk walking, or exercising)*. Participants provided numeric values ranging from 0 to 720 minutes. The questionnaire was tested for validity and showed fair to moderate test-retest reliability.[22] To address sparse distributions for both slow and fast walking, participants were classified into four groups: no walking (0), >0−30 minutes, >30 minutes to 60 minutes, and >60 minutes. The inclusion of the 30-minute category aligns with the minimum recommendation for health benefits from previous studies.[23] Associations for fast walking at finer scale (i.e., 15 minutes) were also explored.

Five behavioral factors with well-established associations with mortality were measured at baseline: cigarette smoking, alcohol drinking, LTPA, sedentary behavior, and diet quality. Briefly, participants were classified into 4 smoking status groups: never, former, current light, and current heavy. Participants who currently smoked ≥20 years and ≥20 cigarettes/day were classified into current heavy smoking group; otherwise, they were considered current light. Participants reporting >0 drink/day but ≤1 for women or ≤2 for men were classified into moderate drinking group; otherwise, they were considered heavy drinking. LTPA was defined as the total of moderate activities (such as bowling, dancing, golfing, or softball) and vigorous sports (such as jogging, aerobics, bicycling, tennis, swimming, weightlifting, or basketball). Standard metabolic equivalents (MET) were calculated using standard methods described in the Compendium of Physical Activity, specifically MET-hours=5.0×moderate +8.0×vigorous.[22] LTPA was categorized into three groups: inactive, fairly active, and active. Participants without any LTPA were classified as inactive, while those reporting <7.5 MET-hours per week were considered fairly active, and those reporting ≥7.5 MET-hours per week (equivalent to the guideline recommendation of ≥150 minutes of moderate activity or ≥75 minutes of vigorous activity per week) were considered active.[24] Total daily sitting time (hours) was used to assess sedentary behaviors. A food frequency questionnaire was used to assess usual dietary intakes, and the diet quality was measured using the Healthy Eating Index (HEI-2010), which evaluates concordance with the 2010 U.S. Dietary Guidelines for Americans.[25] To measure an individual's overall lifestyle, five health behaviors were then combined into a composite lifestyle score for each individual, by taking the sum of the negative of regression coefficients associated with all-cause mortality from the fully adjusted model.[26] This coefficient-based score ranged from −0.06 to 1.27, with a higher value representing a healthier lifestyle.

Information regarding vital status and cause of death was obtained through linkage of the cohort to the National Death Index until December 31, 2022.[21] The primary outcomes for this study are all-cause mortality and mortality due to major causes. Causes of death were grouped according to ICD-10 codes: cardiovascular disease (CVD) (I00−I69), cancers (C00−C97), other non-CVD and noncancer disease causes (deaths with codes starting D−N), as well as external causes such as accidents and injuries (deaths with codes starting V, W, X, or Y). Additionally, site-specific mortality for CVD was classified as follows due to their high prevalences[27]: ischemic heart diseases (I20−I25), heart failure (I50), cerebrovascular diseases (I60−I69), and others.

Statistical Analysis

Hazard ratios (HR) and 95% CI were estimated using Cox proportional hazard regression to assess the associations between daily walking time and all-cause or cause-specific mortality, with follow-up duration as the time scale, stratified by birth year (categorized into 10-year groups). The follow-up stopped at death, loss to follow-up, or December 31, 2022, whichever came first. To account for competing risks, subdistribution hazard models were used for cause-specific mortality.[28] The base model (Model 1) adjusted for enrollment source (CHC, general population), sex (male, female), racial group (Black, white, other), education (<high school, high school, >high school), marital status (married, divorced/separated, widowed, single), household income (<\$15,000, \$15,000−\$24,999, \$25,000−\$49,999, or ≥\$50,000), self-reported employment status (yes, no), and health insurance (insured, none). Model 2 included additional covariates to assess the impacts of lifestyle factors and baseline comorbidities (sum of hypertension, diabetes, myocardial infarction, and stroke): five lifestyle factors mentioned above, BMI (<25, 25−30, >30), and baseline comorbidities (0, 1, 2, ≥3). Model 3 involved mutual adjustment of slow walking and fast walking. Missing values (0.3%−5.8%) were imputed using multiple imputation chained equations (MICE, M=1) with the assumption of missing at random.[29] Frequency distributions of baseline characteristics were tabulated and compared across fast walking time groups. Trend tests were conducted by treating the categorical walking variables as continuous in the model. The proportional hazards assumption was evaluated graphically using the Schoenfeld residuals and confirmed. Sensitivity analyses were conducted among individuals without missing values and included those with missing walking values and those who died within the first 2 years. Stratification analyses were conducted by sex, race, household income, BMI, smoking status, and baseline comorbidities. All statistical analyses were performed using R 4.3.2. A Bonferroni-corrected p-value <0.008 (0.05/6) was considered statistically significant in the analyses of potential interaction effects given six tests were performed. For the main analysis, however, no multiple comparison adjustment was made as specific study hypotheses were tested.

RESULTS

Among the final study sample of 79,856, a total of 26,862 deaths were recorded during a median follow-up of 16.7 (2.0−20.8) years, including deaths due to CVD (n=13,486), cancer (n=6,378), other diseases (n=5,408), and external causes (n=1,590). At baseline, nearly half of the participants (47.9%) reported no fast walking in their daily routine, while around one-third (34.2%) engaged in slow walking for over 3 hours every day (Table 1). Participants with longer daily fast walking times tended to be younger, enrolled from a CHC, male, Black, and single. They also tended to have a lower level of education, household income, insurance coverage, and BMI; higher levels of employment, tobacco smoking, alcohol consumption, LTPA, and sitting time; lower quality diet; and fewer chronic diseases at baseline.

Significant associations between daily fast walking time and all-cause mortality were found, but not for slow walking (Table 2). Participants who engaged in more than 3 hours of slow walking experienced a 4% lower mortality (HR=0.96; 95% CI=0.91, 1.00), although the association was not statistically significant (p=0.06). Notably, participants walking fast experienced a

Table 1. Selected Baseline Characteristics of Participants by Daily Fast Walking, the Southern Community Cohort Study

Characteristics	Whole cohort (N=79,856)	Daily fast walking time, minutes[e] 0 (n=38,249)	>0–30 (n=10,322)	>30–60 (n=13,581)	>60 (n=17,704)
Age, years	52.70 (8.75)	53.94 (9.11)	52.96 (8.53)	52.01 (8.41)	50.39 (7.77)
Enrollment source					
Community health center	85.47	88.29	75.45	81.26	88.45
General population	14.53	11.71	24.55	18.74	11.55
Sex, female	59.62	62.00	61.40	58.26	54.46
Racial groups					
White	30.40	29.91	37.99	32.39	25.53
Black	65.57	66.35	57.52	63.53	70.16
Other	4.02	3.74	4.50	4.08	4.31
Marital status					
Married	35.85	34.37	43.00	38.77	32.61
Separated/divorced	33.43	34.10	30.37	32.30	34.62
Widowed/single	30.72	31.52	26.63	28.93	32.76
Education					
<High school	28.20	34.03	18.54	21.25	26.56
High school	38.55	38.81	33.96	37.57	41.42
>High school	33.25	27.16	47.50	41.18	32.02
Annual household income, $					
<15,000	54.26	62.34	41.22	44.55	51.85
15,000–24,999	21.14	19.94	19.35	21.95	24.15
25,000–49,999	14.47	11.66	18.55	17.84	15.59
≥50,000	10.13	6.06	20.88	15.66	8.41
Employment status, yes	40.43	29.40	51.29	47.82	52.25
Health insurance, yes	60.86	62.45	66.84	61.39	53.52
Obesity[a]	44.64	51.24	44.09	40.17	34.11
Current smoked	40.52	40.79	30.33	37.36	48.31
Heavy alcohol drinking	18.85	16.28	15.91	19.88	25.32
LTPA levels, MET-hour/week	8.44 (18.80)	4.51 (13.96)	9.26 (17.54)	11.66 (20.15)	14.01 (24.71)
Daily sitting time, hours	9.32 (5.06)	9.33 (5.11)	8.99 (4.61)	9.24 (4.71)	9.55 (5.43)
Healthy eating index[b]	57.83 (12.04)	56.83 (11.89)	60.18 (12.31)	59.42 (12.17)	57.39 (11.78)
Healthy lifestyle score[c]	0.49 (0.30)	0.48 (0.30)	0.56 (0.29)	0.52 (0.30)	0.46 (0.31)
Comorbidity index[d]	0.94 (0.89)	1.10 (0.92)	0.88 (0.86)	0.80 (0.84)	0.72 (0.80)

Note: Results are presented as percentage or mean (SD).
[a]Having a BMI >30 kg/m^2.
[b]A composite diet quality score of adherence to the U.S. Dietary Guidelines for Americans 2010, ranging from 0 to 100.
[c]A lifestyle score derived from the regression coefficients associated with all-cause mortality of smoking status, alcohol intake, and healthy eating index.
[d]A composite score based on the presence or absence of hypertension, diabetes, myocardial infarction, stroke, and cancers.
[e]Differences across walking time groups were statistically significant at $p<0.001$ for all comparisons.
LTPA, leisure-time physical activity; MET, metabolic equivalents.

significant risk reduction with as little as 15 minutes of walking per day (HR=0.81; 95% CI=0.75, 0.87). Additional adjustment of lifestyle factors slightly attenuated the associations for both slow and fast walking time. Still, the association remained highly significant for fast walking (Model 2), and no major differences were seen for mutual adjustment (Model 3).

Sensitivity analyses, conducted both with participants having complete data and including individuals who died within the first 2 years, yielded consistent results for the association of time spent on slow or fast walking with overall mortality (Appendix Table 1). Similar association patterns of daily fast walking time were observed for all cause-specific mortality outcomes (Figure 1). The associations, however, were most pronounced for CVD (HR=0.80; 95% CI=0.76, 0.84 for >60 versus inactive) and followed by other diseases, cancers, and external causes. Among the causes of CVD, heart diseases, especially ischemic heart diseases and heart failure, showed stronger associations (Appendix Figure 1).

Table 2. Associations of Daily Walking by Pace With All-Cause Mortality, the Southern Community Cohort Study

Daily walking time, minutes	No. of participants	No. of deaths	HR (95% CI)[a]	HR (95% CI)[b]	HR (95% CI)[c]
Slow walking					
0	6,444	2,235	1 (Ref.)	1 (Ref.)	1 (Ref.)
>0–30	7,085	2,536	0.99 (0.93, 1.04)	1.00 (0.94, 1.06)	0.99 (0.93, 1.05)
>30–60	15,372	5,308	0.97 (0.92, 1.02)	0.98 (0.93, 1.03)	0.98 (0.93, 1.03)
>60	50,955	16,783	0.96 (0.92, 1.01)	0.97 (0.93, 1.02)	0.96 (0.92, 1.01)
>60–180	23,687	8,319	0.97 (0.93, 1.02)	0.99 (0.94, 1.04)	0.99 (0.94, 1.05)
>180	27,268	8,464	0.96 (0.91, 1.00)	0.96 (0.92, 1.01)	0.96 (0.92, 1.01)
p-trend			0.088	0.144	0.115
Fast walking					
0	38,249	15,602	1 (Ref.)	1 (Ref.)	1 (Ref.)
>0–30	10,322	2,746	0.77 (0.73, 0.80)	0.82 (0.79, 0.86)	0.82 (0.79, 0.86)
>0–15	2,401	678	0.81 (0.75, 0.87)	0.86 (0.80, 0.93)	0.86 (0.80, 0.93)
>15–30	7,921	2,068	0.75 (0.72, 0.79)	0.81 (0.77, 0.85)	0.81 (0.77, 0.85)
>30–60	13,581	3,657	0.77 (0.74, 0.79)	0.82 (0.79, 0.85)	0.82 (0.79, 0.85)
>60	17,704	4,857	0.80 (0.77, 0.82)	0.84 (0.81, 0.87)	0.84 (0.80, 0.89)
p-trend			<0.001	<0.001	<0.001

Note: p-trends were calculated across four categories (0, >0–30, >30–60, and >60).
[a]Model 1: Adjusted for enrollment source, age, sex, race, education, marital status, household income, employment, and insurance status.
[b]Model 2: Additionally adjusted for smoking status, alcohol intake, diet quality, leisure-time physical activity, daily sitting time, BMI, and comorbidities.
[c]Model 3: Additional mutual adjustment for slow or fast walking time.

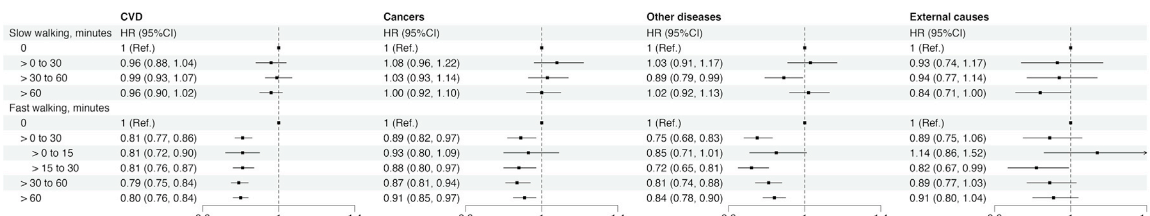

Figure 1. Associations of daily walking time by pace with cause-specific mortality, the Southern Community Cohort Study.
Notes: HRs were adjusted for enrollment source, age, sex, race, education, marital status, household income, employment, insurance status, smoking status, alcohol intake, diet quality, daily sitting time, BMI, and comorbidities when applicable.
CVD, cardiovascular diseases.

Stratified analyses revealed significant multiplicative interactions of fast walking with sex, household income, and smoking status in mortality (Appendix Figure 2). However, the more apparent interactions were found for household income and smoking status. It appears that the associations with fast walking was more apparent among participants with higher household income and those not currently smoking. No significant variations were seen across race, BMI, or comorbidity subgroups.

Among those with fast walking, no further reduction in mortality was found with increasing slow walking time (Table 3). However, among those spending some time slow walking, an increasing amount of fast walking time was found to reduce the mortality further. The association between fast walking time and mortality was independent of LTPA, with no significant interaction observed (Appendix Table 2). For individuals involved in any level of LTPA, regardless of whether they reached the recommended level or not, additional benefits were observed for those who engaged in longer periods of fast walking (HR=0.84 for >60 minutes fast walking versus 0 across all LTPA groups).

DISCUSSION

In this large prospective cohort study conducted in a predominantly low-income and Black population, regular fast walking was associated with reduced risks of all-cause and major cause-specific mortality. Fast walking was independently associated with reduced mortality, regardless of the levels of LTPA, and engaging in just 15 minutes of fast walking per day resulted in a

Table 3. Joint Associations of Daily Walking With All-Cause and Cause-Specific Mortality, the Southern Community Cohort Study

Slow walking time, minutes	Fast walking time, minutes: 0		>0−60		>60	
	No. of deaths	HR (95% CI)	No. of deaths	HR (95% CI)	No. of deaths	HR (95% CI)
All causes						
0	1,330	1 (Ref.)	238	0.75 (0.65, 0.86)	667	0.79 (0.72, 0.87)
>0−120	4,973	0.94 (0.88, 1.00)	2,310	0.79 (0.73, 0.84)	561	0.76 (0.68, 0.84)
>120	9,299	0.94 (0.88, 0.99)	3,855	0.78 (0.73, 0.83)	3,629	0.81 (0.76, 0.87)
CVD						
0	704	1 (Ref.)	111	0.73 (0.59, 0.89)	309	0.79 (0.69, 0.91)
>0−120	2,667	0.95 (0.87, 1.03)	1,138	0.77 (0.70, 0.85)	258	0.73 (0.63, 0.84)
>120	4,796	0.94 (0.86, 1.01)	1,849	0.77 (0.71, 0.84)	1,654	0.77 (0.71, 0.85)
Cancers						
0	275	1 (Ref.)	70	0.95 (0.73, 1.23)	169	0.85 (0.70, 1.03)
>0−120	1,111	1.04 (0.91, 1.19)	576	0.89 (0.77, 1.03)	154	0.90 (0.74, 1.10)
>120	2,079	0.98 (0.86, 1.11)	989	0.87 (0.76, 1.00)	955	0.92 (0.81, 1.06)
Other diseases						
0	276	1 (Ref.)	41	0.60 (0.43, 0.83)	128	0.72 (0.58, 0.88)
>0−120	944	0.85 (0.74, 0.97)	431	0.70 (0.60, 0.82)	104	0.67 (0.53, 0.84)
>120	1,954	0.94 (0.83, 1.07)	778	0.75 (0.65, 0.86)	752	0.81 (0.70, 0.93)

Note: Models were adjusted for enrollment source, age, sex, race, education, marital status, household income, employment, insurance status, smoking status, alcohol intake, diet quality, leisure-time physical activity, daily sitting time, BMI, and comorbidities.
CVD, cardiovascular diseases.

substantial reduction in the risk of death. These findings highlight the importance of promoting walking, especially fast walking, as a form of physical activity to improve health, particularly in low-income and Black communities where poor health outcomes are prevalent.

To the authors' knowledge, this is one of the few studies to quantify the effect of daily walking on mortality in a low-income and predominantly Black U.S. population. Historically, these communities have faced barriers to accessing healthcare services.[30,31] By demonstrating the benefits of fast walking, which is a low-cost and largely accessible activity,[32] direct evidence was shown to inform targeted interventions and policies to improve health equity. Public health campaigns and community-based programs can emphasize the importance and availability of fast walking to improve health outcomes, providing resources and support to facilitate increased fast walking within all communities.[33] Furthermore, the findings of the reduced mortality associated with fast walking pace were supported by previous studies conducted in middle and upper-middle income populations.[4,34−36] In this current study, fast walking showed a stronger association with a reduced mortality among higher income participants or those not currently smoking. However, the magnitudes of these associations were generally comparable, and future studies are needed to validate these findings. A faster walking pace was associated with a greater reduction in mortality in a more time-efficient pattern, which suggests that individuals should strive to incorporate more intense physical activity into their routines, such as brisk walking or other forms of aerobic exercise.[5]

CVD remains a significant public health concern worldwide, with a substantial impact on morbidity and mortality.[37] Physical activity, including daily walking, is consistently recognized as a modifiable lifestyle factor that can help reduce CVD-specific mortality.[38,39] The findings revealed a strong and significant association between fast walking and CVD-specific mortality, especially for heart diseases. Participants who engaged in fast walking experienced a substantial risk reduction, with as short as a 15-minute walking leading to a 19% lower risk of CVD-specific mortality compared to inactive individuals. The observed benefits of fast walking for a reduction in CVD mortality may be attributed to several underlying mechanisms. First, fast walking is a form of aerobic exercise that improves cardiac output, increases oxygen delivery to the muscles, and enhances the efficiency of the heart's pumping action.[40] These physiological adaptations contribute to a reduced CVD mortality by improving overall cardiovascular health. Second, fast walking has a positive impact on various CVD risk factors.[41] Regular participation in fast walking helps control body weight and body composition, reducing the prevalence of obesity and its associated cardiovascular risks, such as hypertension and dyslipidemia. Finally, fast walking offers a convenient, accessible, and low-impact activity that individuals of all ages and fitness levels can use to improve cardiovascular health.[42]

Long duration of slow walking (>1 hour/day) was significantly associated with reduced mortality due to ischemic heart disease. This finding is supported by previous studies shown that light-intensity walking could have some benefits for cardiometabolic functions.[10] Thus, for individuals unable to walk fast but capable of walking slowly, walking more may still have some benefits.

Limitations

The major strengths of this study are our ability to evaluate potential health benefits by walking pace and the focus on a predominantly low-income and Black population, providing valuable insights into the impact of daily walking on the mortality of an underrepresented population. Long follow-ups and large sample size of this study contributed to robust and reliable estimates. However, some limitations may exist. First, the self-reported data on daily walking may include other types of physical activity for some individuals, such as climbing stairs, which may introduce misclassification. Future studies should consider incorporating objective measurements. Second, information on physical activity was collected only at baseline, limiting the ability to examine the impacts of changes in physical activity over time. Also, reverse causation and unmeasured confounding cannot be ruled out entirely given the nature of observational studies, although the sensitivity analyses showed consistent results. Furthermore, investigating the influence of material well-being and psychosocial stressors on the association between walking and mortality outcomes should be explored in the future, particularly given their high prevalence in low-income populations.

CONCLUSIONS

In a predominantly low-income and Black sample of participants, fast walking was strongly associated with reduced total and cause-specific mortality, underscoring the importance of promoting daily walking as a feasible and effective strategy for improving health outcomes. Public health interventions may prioritize addressing barriers to daily walking, such as inadequate infrastructure, safety concerns, and limited access to recreational spaces, to facilitate increased walking participation among all populations.

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SUPPLEMENTAL MATERIAL

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