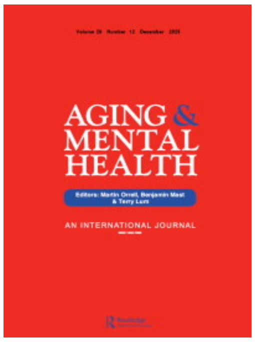

Aging & Mental Health

ISSN: 1360-7863 (Print) 1364-6915 (Online) Journal homepage: www.tandfonline.com/journals/camh20

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AGING & MENTAL HEALTH
https://doi.org/10.1080/13607863.2025.2562139

Loneliness and performance-based measures of physical function: coordinated meta-analytic findings from six cohorts

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ABSTRACT

Objectives: . Feeling lonely is associated with worse health as people get older, yet its relation to physical function is unclear. This study examined the association between loneliness and performance-based measures of physical function.

Methods: . Participants (age range: 34–103 years; $N > 33{,}000$) were from six established cohorts: Five were from the United States and one was from the United Kingdom. Participants were assessed on loneliness, demographic factors, disease burden, physical inactivity, gait speed, grip strength, lower limb strength, and standing balance.

Results: . Higher loneliness was associated with a higher likelihood of slow gait speed ($k=6$; pooled odds ratio [OR] = 1.25; 95% CI= 1.16;1.35, $p<0.001$), weak grip strength ($k=5$; OR= 1.19; 95% CI= 1.09;1.30, $p<0.001$), weak lower limb strength ($k=5$; OR= 1.19; 95% CI= 1.13;1.27, $p<0.001$), and balance impairment ($k=3$; OR= 1.29; 95% CI= 1.23;1.36, $p<0.001$). These associations were independent of disease burden and physical inactivity. There was little consistent evidence that sociodemographic factors moderated these associations.

Conclusion: The present study provides replicable evidence that loneliness is associated with worse performance across multiple domains of physical function.

ARTICLE HISTORY
Received 22 May 2025
Accepted 8 September 2025

KEYWORDS
Loneliness; gait speed; grip strength; chair stands; standing balance

Introduction

Loneliness has been identified as a major public health crisis (World Health Organization, 2021). Loneliness is prevalent in old age (Graham et al., 2024; Hajek et al., 2025) and has pervasive effects on a range of health-related outcomes: higher loneliness has been associated with higher disease burden (Freilich et al., 2024; Hajek et al., 2020), higher inflammation (Smith et al., 2020), depression (Lee et al., 2021), poor cognitive function (Lee et al., 2025), and a higher risk of incident neurodegenerative diseases, such as Alzheimer disease and related dementias (Luchetti et al., 2024) and Parkinson disease (Terracciano et al., 2023). Furthermore, feeling lonely has been associated with a higher risk of mortality (Long et al., 2023; Wang et al., 2023).

Although there is replicated evidence for an association between loneliness and a range of health outcomes, less attention has been devoted to the association between loneliness and aspects of physical function. Performance-based measures of physical function, such as gait speed, grip strength, lower limb strength, and standing balance, are critical markers of overall health status, fitness, and functioning in old age (Cui et al., 2021; Semba et al., 2020; Stephan et al., 2024; Studenski et al., 2011). There are several reasons why loneliness may be associated with these performance-based measures. Loneliness is associated with physical inactivity (Pels & Kleinert, 2016) and biological dysfunction (e.g. inflammation; Smith et al., 2020) that contributes to worse performance on measures of physical function (Semba et al., 2020; Stathi et al., 2022; Tuttle et al., 2020). The higher burden of chronic disease in people who feel lonely (Freilich et al., 2024) may also contribute to poor fitness and physical performance (Rundell et al., 2021).

Previous studies on loneliness and performance-based measures of physical function have mostly focused on the prediction of gait speed with mixed findings: some research reported that loneliness was associated with slower gait speed (MacAulay et al. 2024; McCaffery et al., 2020; Philip et al., 2020; Shankar et al. 2017; Wilson & Koffer, 2025), whereas other

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Supplemental data for this article can be accessed online at https://doi.org/10.1080/13607863.2025.2562139.

research found no association (Kuang et al., 2023; Lee et al., 2023). Fewer studies have tested the association between loneliness and other measures of physical function. Mixed findings have been found for grip strength: three studies reported an association between loneliness and weaker grip strength (Kim & Park, 2023; Wilson & Koffer, 2025; Yu et al., 2020), whereas no association was found in another study (Lee et al., 2023). Only one study has tested and found an association between higher loneliness and weaker lower limb strength and lower scores on standing balance (Philip et al., 2020). Therefore, there is a limited body of research on the association between loneliness and performance-based measures of physical function, with mixed findings for measures of gait speed and grip strength. No large-scale, multi-cohort study has been conducted on the replicable association between loneliness and performance-based measures of physical function. Finally, the extent to which the association between loneliness and performance-based physical function generalizes across domains or whether this link is specific to measures of gait speed, grip strength, lower limb strength and standing balance is unclear. It is also unclear whether there are robust patterns of moderation by age and sex, which is important to explore given the substantial age and sex differences in these performance-based measures (Huemer et al., 2023; Ko et al., 2010; Tolea et al., 2010).

The present study used a coordinated analysis of six large samples of middle-aged and older adults to examine the association between loneliness and performance-based measures of physical function. A coordinated analysis approach makes it possible to evaluate the replicability and generalizability of the tested associations. Four measures of physical function were examined: gait speed, grip strength, chair stands (measure of lower limb strength), and standing balance. The link between loneliness and these measures was tested in each sample and then the results were synthesized with a random-effects meta-analysis. Building upon previous research (Kim & Park, 2023; MacAulay et al. 2024; Philip et al., 2020), it was predicted that higher loneliness would be related to slower gait speed, weaker grip strength, weaker lower limb strength, and balance impairment. Additional analysis tested whether clinical (e.g. disease burden) and behavioral (physical activity) factors accounted for these associations. Although disease burden and physical activity could be confounding factors, they may also mediate the association between loneliness and physical function. Finally, exploratory analyses tested whether age or sex moderated the link between loneliness and each performance-based measure of physical function. Such analyses address whether the association between loneliness and physical function generalizes across sociodemographic groups.

Method

Participants

Participants were from six publicly available datasets, including five cohorts from the United States (US) (the Health and Retirement Study [HRS], the Midlife in the United States study [MIDUS], the National Social Life, Health and Aging Project [NSHAP], the Wisconsin Longitudinal Study [WLS] and the National Health and Aging Trends Study [NHATS]) and one from the United Kingdom (the English Longitudinal Study of Ageing [ELSA]),These datasets were selected because they are publicly available and provide relevant data on loneliness and at least one performance-based measure of physical function (gait speed, grip strength, chair stand, standing balance). Written informed consent was obtained from each participant by the parent study in the six samples. The analysis of de-identified, public data did not require IRB review. Descriptive statistics for each sample are in Table 1.

The HRS is a nationally representative longitudinal survey of individuals aged 50 years and older living in the United States. Data were obtained in 2006/2008. The analytical sample had 12,416 participants with data on loneliness, demographic factors, and at least one performance-based measure of physical function. Gait speed was only assessed among participants aged 65 and older, resulting in a sample of 7,285 individuals for the analysis on this outcome. There was no measure of chair stand in the HRS.

ELSA is a panel study of a representative cohort of adults aged 50 years and older living in England. The analytical sample had 7,291 individuals with data on loneliness, demographic factors, and at least one performance-based measure of physical function in Wave 2 (2004/2005). The gait speed task was administrated to participants aged 60 years and older, resulting in a sample of 4,952 participants.

The MIDUS is a nationally representative longitudinal study of a random-digit-dial sample of US adults. The present study used data from MIDUS II (2004–2006). The analytical sample had 1,198 participants with data on loneliness, demographic factors, and at least one performance-based measure of physical function. No data on standing balance was collected in MIDUS.

The NSHAP is a nationally representative longitudinal study of older adults. Data were available from Wave 2 (2010–2011). The analytical sample had 2437 participants with data on loneliness, demographic factors, and data on at least one physical function measure. There was no measure of grip strength or standing balance in the NSHAP.

The WLS is a long-term study of a random sample of men and women who graduated from Wisconsin high schools in 1957 and their selected siblings. Data was obtained in 2011. The analytical sample had 7316 participants with data on loneliness,

Table 1. Descriptive statistics for the six samples.

	HRS		ELSA		MIDUS		NSHAP		WLS		NHATS	
Variables	*M/%*	SD	*M/%*	SD	*M/%*	SD	*M/%*	SD	*M/%*	SD	*M/%*	*SD*
Age (Years)	68.61	9.80	66.16	9.08	54.48	11.68	72.76	7.20	70.51	4.09	81.41	6.24
Sex (% women)	59%	–	55%	–	57%	–	53%	–	53%	–	57%	–
Race (% African American/Black)	12%	–	1%[a]	–	19%	–	12%	–	0%	–	19%	–
Ethnicity (% Hispanic)	8%	–	–	–	–	–	9%	–	0%	–	4%	–
Education	12.68	3.06	4.61	2.23	7.48	2.54	2.67	1.33	13.94	2.46	5.78	2.22
Loneliness	1.48	0.54	1.36	0.50	2.04	0.80	1.03	0.76	0.73	1.46	1.88	1.01
Slow gait speed (%)	48.7%	–	36%	–	12.2%	–	72.2%	–	17.2%	–	55.6%	–
Weak grip strength (%)	10%	–	9.9%	–	2.8%	–	–	–	9.2%	–	25%	–
Balance impairment (%)	7.7%	–	3.7%	–	–	–	–	–	–	–	13.5%	–
Lower limb strength (%)	–	–	15.2%	–	11%	–	28.1%	–	5.9%	–	17%	–

Note. HRS: $N = 12416$; ELSA: $N = 7291$; MIDUS: $N = 1198$; NSHAP: $N = 2437$; WLS: $N = 7316$; NHATS: $N = 2941$.
[a]Percent of non-white participants.

demographic factors, and at least one performance-based measure of physical function. Standing balance was not assessed in the WLS.

NHATS is a nationally representative longitudinal panel study of Medicare beneficiaries aged 65 and older. Data was obtained in Round 11 (2021). The analytical sample had 2941 participants with data on loneliness, demographic factors, and at least one performance-based measure of physical function.

Measures

Loneliness

Loneliness was assessed using 3 items from the University of California, Los Angeles (UCLA) Loneliness Scale in the HRS, ELSA, and NSHAP. The three items were: 'How often do you feel you lack companionship?'; 'How often do you feel left out?' and 'How often do you feel isolated from others?' Items were rated on a 3-point scale from 1 (hardly ever or never) to 3 (often) in the HRS and ELSA and on a 4-point scale from 0 (never) to 3 (often) in the NSHAP. The mean of the three items was taken with higher scores indicative of higher loneliness. In the NHATS, participants were asked to rate the following item: 'How often do you feel lonely?' on a 5-point scale, from 1 (never) to 5 (everyday [7 days a week]). In the WLS, loneliness was assessed with the item: 'On how many days during the past week did you feel lonely?' The number of days was reported, from 0 to 7. A 3-item scale was used in the MIDUS. Specifically, participants were asked to indicate 'During the past 30 days, how much of the time did you feel…', and rated each item: 'lonely', 'close to others', and 'like you belong' (Freilich et al., 2024). Items were rated on a 5-point scale, ranging from 1 (none of the time) to 5 (all the time). Items were averaged, with higher scores indicative of higher loneliness.

Gait speed

In all six samples, participants were asked to walk at their usual speed and the best of two trials was taken. The distance was 2.5 meters in HRS and WLS, 3 meters in the NSHAP and the NHATS, 2.43 meters in ELSA, and 15.24 meters in the MIDUS. Gait speed was calculated by dividing the distance (in meters) by time in seconds (m/s). Slow gait speed was defined as a pace of <0.80 meters/seconds and coded as 1, whereas a pace ≥ 0.80 meters/seconds was coded as 0 (Studenski et al., 2011).

Grip strength

In the HRS, ELSA, MIDUS, NHATS, and WLS, a dynamometer was used to assess grip strength of the dominant hand. The best performance (in kg) of two trials in the HRS, NHATS and WLS and three trials in ELSA and MIDUS was used as the measure of grip strength. Weak grip strength was defined as <26kg for males and <16kg for females and coded as 1 and ≥26kg for males and ≥16kg for females coded as 0 (Alley et al., 2014).

Lower limb strength

The five times sit-to-stand test (FTSST) was used to assess lower limb strength in ELSA, MIDUS, NSHAP, WLS, and NHATS. Participants were asked to stand up from a sitting position on a chair to a full standing position five times as quickly as possible with their arms folded across the chest. The time taken to complete the five repetitions was recorded in seconds. Weak lower limb strength was defined as Time > 15s to complete the task and coded as 1, whereas time ≤ 15s was coded as 0 (Cruz-Jentoft et al., 2019).

Standing balance

Standing balance was assessed using three separate stances in the HRS, ELSA, and the NHATS. The HRS first did a semi-tandem balance task by asking participants to stand up with the side of the heel of one foot touching the toe of the other foot for about 10 s. If participants were unable to complete this task for 10 s, they were asked to perform the side-by-side tandem task with both feet together side-by-side for 10 s. Participants who were able to perform the semi-tandem task for 10s were asked to perform the full-tandem balance task, with the heel of one foot in front of and touching the toes of the other foot. Participants aged 65 years and older were asked to perform the full-tandem task for 30s, whereas participants younger than 65 years old were asked to perform the task for 60s. In ELSA and NHATS, participants were first asked to complete the side-by-side task for 10s. Participants who were able to perform this task were asked to complete the semi-tandem test for the full 10 s. In ELSA, participants who were able to perform the semi-tandem task were asked to complete a 30s full tandem task for those younger than 70 years old, or a 10s full-tandem task for those aged 70 years and older. In NHATS, a 10s full-tandem task was administered to participants who were able to perform the semi-tandem test. Balance impairment was defined as the inability to perform the semi-tandem stance and coded as 1, and no balance impairment was defined as being able to complete the semi-tandem and coded as 0 (Tu et al., 2022).

Covariates

Analyses were adjusted for sociodemographic covariates in the six samples. Age, sex (0 = male, 1 = female), and education were controlled in all samples. Education was measured in years in HRS and WLS and reported on a scale from 1 (no qualification) to 7 (NVQ4/NVQ5/Degree or equivalent) in ELSA, from 1 (no school/some grade school) to 12 (doctorate or professional degree) in MIDUS, and from 1 (none) to 6 (law, MD, or PhD) in the NSHAP and from 1 (no schooling completed) to 9 (master's, professional, or doctoral degree) in NHATS. Race was coded as 0 = not African American/Black, and 1 = African American/Black in HRS, MIDUS, NSHAP, and NHATS; it was coded as 0 for white and 1 for not white in ELSA. WLS was white. Ethnicity was included as a covariate in the HRS, NHATS, and NSHAP and was coded as 0 = non-Hispanic and 1 = Hispanic. Additional analyses were included disease burden and physical activity as covariates (see supplementary material).

Data analysis

Logistic regression analyses were conducted to examine the link between loneliness and each performance-based measures of physical function. The association between loneliness and slow gait speed, weak grip strength, weak lower limb strength, and balance impairment was tested respectively in six (HRS, ELSA, MIDUS, NSHAP, NHATS, WLS), five (HRS, ELSA, MIDUS, NHATS, WLS), five (ELSA, MIDUS, NSHAP, NHATS, WLS) and three (HRS, ELSA, NHATS) samples. All continuous predictors were standardized to z-scores. Each analysis was adjusted for sociodemographic covariates. Clinical and behavioral covariates were included in additional analyses. Estimates from the logistic regression analyses were combined in a random-effects meta-analysis with STATA software. Heterogeneity was estimated using I^2.

Exploratory analyses tested moderation by age and sex with an interaction between loneliness and age or sex within each sample.

Results

Across samples, 12%–72% of participants had slow walking speed, 3%–25% of participants had weak grip strength, 6 to 28% of participants had weak lower limb strength, and 4%–13% of participants had balance impairment. Results of the logistic regression analyses are in Table 2 and Figure 1. The meta-analysis revealed that loneliness was related to worse performance on each measure of physical function (Table 2, Model 1). Indeed, a one standard deviation (SD) higher loneliness was associated with a 25% higher likelihood of having slow gait speed, 19% higher likelihood of having weak grip strength, 19% higher likelihood of having weak lower limb strength, and with a 29% higher likelihood of having balance impairment. These associations were observed in all cohorts except MIDUS (grip strength, chair stands) and NHATS (grip strength).

When clinical and behavioral factors were included as additional covariates, the association between loneliness and each performance-based measure was attenuated but remained significant (Table 2, Model 2). The meta-analytic associations between loneliness and slow gait speed, weak grip strength, weak lower limb strength, and balance impairment were reduced by 32%, 32%, 42%, and 31%, respectively.

There was little evidence of moderation by age or sex, with a notable exception for age and balance impairment and grip strength. There was a replicable significant interaction between loneliness and age on balance impairment and grip strength in the HRS, ELSA, and NHATS (supplementary Table S1). Although loneliness was related to a higher likelihood of weak grip strength and balance impairment across all ages, the association was stronger among younger participants in the three samples (<65 years in HRS and ELSA, ≤80 years in NHATS). There was no other replicated interaction between loneliness and age on gait speed and chair stands. Furthermore, there was no replicable evidence for moderation by sex (Table S1).

Discussion

The present study examined the association between loneliness and performance-based measures of physical function in six large samples of older adults that included more than 33,000 individuals. As expected, loneliness was related to a higher likelihood of slow gait speed, weak grip strength, weak lower limb strength and balance impairment. Of note, the

Table 2. Loneliness associations with performance-based measures of physical function.

Outcome: Gait Speed	Model 1				Model 2			
Studies (6)	*N*	OR	95% CI	*p*	*N*	OR	95% CI	*p*
HRS	7,285	1.205	(1.145;1.268)	<.001	7,147	1.141	(1.083;1.203)	<.001
ELSA	4,952	1.428	(1.341;1.521)	<.001	4,933	1.264	(1.182;1.352)	<.001
MIDUS	1,186	1.256	(1.047;1.507)	.014	1,167	1.103	(0.903;1.348)	.335
NSHAP	2,417	1.130	(1.024;1.246)	.015	2,415	1.090	(0.985;1.206)	.095
WLS	7,211	1.167	(1.103;1.235)	<.001	6,502	1.134	(1.067;1.026)	<.001
NHATS	2,728	1.324	(1.209;1.449)	<.001	2,728	1.260	(1.147;1.385)	<.001
Overall		1.248	(1.158;1.345)	<.001		1.171	(1.112; 1.233)	<.001
Heterogeneity		I^2= 82.71				I^2= 58.86		

Outcome: Grip Strength	Model 1				Model 2			
Studies (5)	*N*	OR	95% CI	*p*	*N*	OR	95% CI	*p*
HRS	12,180	1.186	(1.117;1.259)	<.001	11,943	1.120	(1.053;1.191)	<.001
ELSA	6,740	1.370	(1.273;1.475)	<.001	6,740	1.240	(1.149;1.338)	<.001
MIDUS	1,198	1.015	(0.697;1.479)	.937	1,178	0.968	(0.649;1.442)	.874
WLS	7,287	1.157	(1.078;1.241)	<.001	6,568	1.137	(1.053;1.226)	<.001
NHATS	2,702	1.091	(0.997;1.194)	.057	2,702	1.057	(0.966;1.157)	.227
Overall		1.189	(1.087;1.301)	<.001		1.135	(1.069; 1.205)	<.001
Heterogeneity		I^2= 80.52				I^2= 55.12		

Outcome: Chair Stands	Model 1				Model 2			
Studies (5)	*N*	OR	95% CI	*p*	*N*	OR	95% CI	*p*
ELSA	5,874	1.199	(1.118;1.285)	<.001	5,874	1.122	(1.044;1.205)	.002
MIDUS	1,142	0.974	(0.801;1.185)	.794	1,125	0.831	(0.669;1.031)	.092
NSHAP	2,207	1.224	(1.113;1.346)	<.001	2,205	1.195	(1.086;1.316)	<.001
WLS	6,901	1.149	(1.054;1.252)	.002	6,238	1.081	(0.982;1.190)	.111
NHATS	2,230	1.320	(1.188;1.467)	<.001	2,230	1.265	(1.137;1.408)	<.001
Overall		1.195	(1.126;1.268)	<.001		1.114	(1.001; 1.239)	.047
Heterogeneity		I^2= 44.63				I^2= 80.68		

Outcome: Standing Balance	Model 1				Model 2			
Studies (3)	*N*	OR	95% CI	*p*	*N*	OR	95% CI	*p*
HRS	11,989	1.286	(1.202;1.375)	<.001	11,748	1.189	(1.110;1.274)	<.001
ELSA	6,588	1.330	(1.189;1.488)	<.001	6,588	1.198	(1.067;1.346)	.002
NHATS	2,741	1.260	(1.133;1.40)	<.001	2,741	1.224	(1.100;1.362)	<.001
Overall		1.289	(1.225;1.356)	<.001		1.199	(1.139; 1.263)	<.001
Heterogeneity		I^2= 0				I^2= 0.01		

Note. N is the number of participants with data for each measure of physical function. OR are odds ratios from logistic regressions within each sample. Model 1 controlled for age, sex, education, marital status, and race and ethnicity (where available). Model 2 controlled for Model 1 covariates and clinical and behavioral covariates.

associations were robust and replicable across different samples with different sociodemographic characteristics and different loneliness measures. The associations between loneliness and measures of physical function remained significant but were partly accounted for by clinical and behavioral factors. Finally, the associations were similar across sociodemographic groups, although there was some modest evidence that loneliness had weaker associations with grip strength and balance impairment among older participants.

The present study is consistent with existing evidence for loneliness and worse health in older adults. These findings expand the limited body of research on physical function (MacAulay et al. 2024; McCaffery et al., 2020; Philip et al., 2020; Shankar et al. 2017; Wilson & Koffer, 2025) by providing the largest multi-cohort and multi-measure test of the association between loneliness and poor performance on measures of physical function. The use of the same analytic approach across multiple cohorts provides evidence of the replicability of the findings. The simultaneous testing of multiple performance measures provides evidence that the associations were not limited to a specific domain such as gait speed, upper or lower limb strength, or balance, but pointed to a broad pattern that feeling lonely is related to worse performance across all tasks and physical domains assessed. Of note, effect sizes for gait speed and standing balance were slightly stronger than for grip strength. This pattern of association suggests that loneliness is more strongly related to functions that require a complex interplay of several systems (nervous, sensory, and motor). For example, balance is a highly complex function that requires the central nervous system to integrate sensory information from multiple body systems, including visual, vestibular, and somatosensory, as well as coordinate the effort of muscles across multiple joints.

Several mechanisms could explain the association between loneliness and physical function. Given that performance-based measures of physical function are critical markers of overall health status (Cui et al., 2021; Dommershuijsen et al., 2020; Stephan et al., 2024;

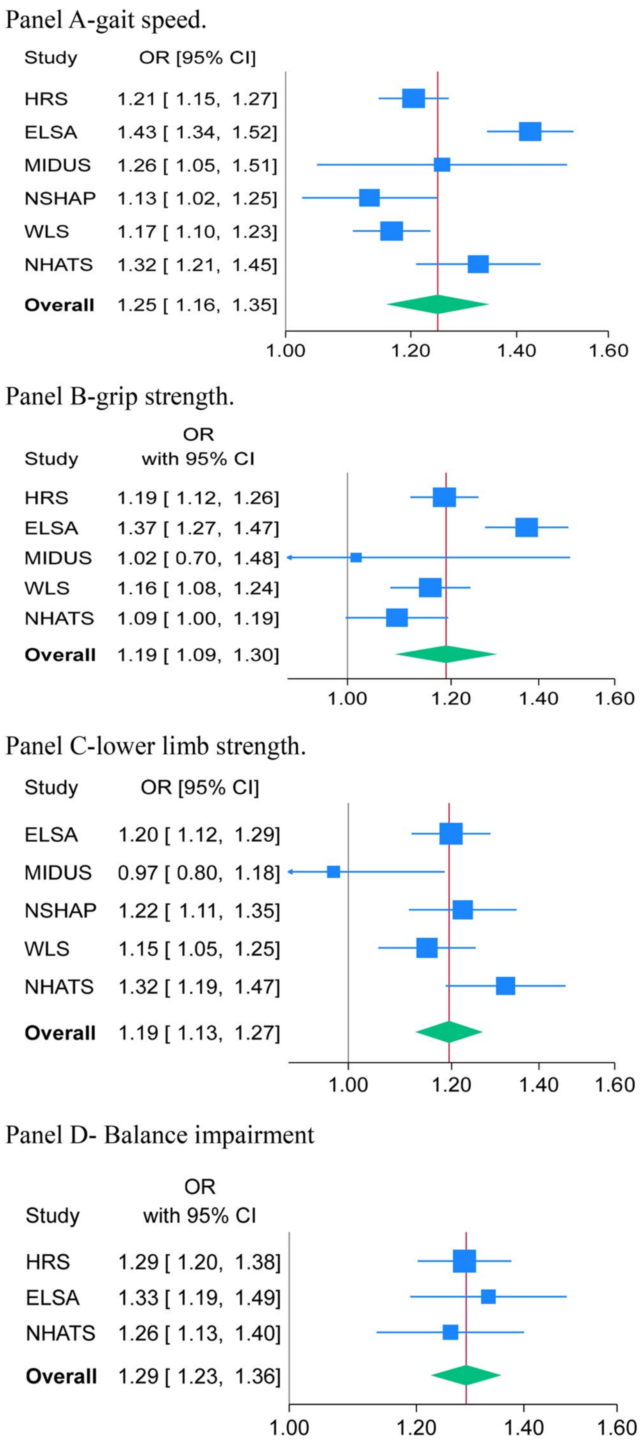

Figure 1. Loneliness associations with slow gait speed (Panel a), weak grip strength (Panel B), weak lower limb strength (Panel C), and balance impairment (Panel D). Panel A-gait speed. Panel B-grip strength. Panel C-lower limb strength. Panel D- Balance impairment

Studenski et al., 2011), it is likely that they may reflect the poor health-related profile associated with loneliness. In particular, higher loneliness is associated with higher disease burden (Freilich et al., 2024), which may have negative implications for muscle strength, balance, and other functions. Furthermore, loneliness is associated with behavioral factors such as physical inactivity (Pels & Kleinert, 2016) which over time has detrimental effects on fitness and physical function. Our analyses provided support for a model in which higher disease burden and physical inactivity partially account for the association between loneliness and slow gait speed, weak grip strength, weak lower limb strength, and balance impairment. Other brain-related, cognitive, biological, and psychological factors may also act as potential pathways linking loneliness to physical function. For example, loneliness is related to worse brain health (Lam et al., 2021; but see Terracciano et al., 2025), lower cognitive function (Lee et al., 2025), higher inflammation (Smith et al., 2020), and stress reactivity (Brown et al., 2019), which may impair performances on measures of physical function.

Although feeling lonely was associated with a higher likelihood of weaker grip strength and balance impairment across all ages, these associations were attenuated with advancing age. This finding is consistent with existing research reporting that the link between psychological factors (such as personality) and health-related outcomes decreases with advancing age (Löckenhoff et al., 2008; Luo et al. 2023). According to this research, the health-related implications of psychological factors are likely to be overshadowed by the pervasive age-related physical and biological declines encountered by individuals (Löckenhoff et al., 2008; Luo et al. 2023). Therefore, it is likely that declining physical health may overcome the contribution of loneliness on muscle strength and standing balance when individuals progress to old age.

The present study has several strengths, including the coordinated analyses of the association between loneliness and performance-based measures of physical function in six large samples of older adults, a comprehensive assessment of different functions, and a meta-analysis. There are also several limitations to consider. The cross-sectional design of the present study limits causal or temporal interpretations. Although loneliness was considered as the predictor of physical function, bi-directional relationships are also likely to exist, with worse physical function predicting loneliness (Vingeliene et al., 2023). Longitudinal research with repeated assessments is needed to test for these potential reciprocal relationships. Future studies should also examine whether these associations are evident among younger individuals or emerge in older adulthood. While the findings suggest that loneliness has a broad pattern of associations with all measures of physical performance we tested, future research should examine whether this pattern extends to other domains not included in this study, such as endurance and flexibility or more complex measures like dual-task walking speed. Finally, the present study was conducted among samples from the US and the UK. Further research is needed to examine the association between loneliness and physical function in other countries, including low and middle-income countries.

To conclude, the present study showed that loneliness is consistently related to worse performance on multiple domains of physical function in a coordinated analysis of six samples. Higher loneliness is associated with slow gait speed, weak grip strength, weak lower limb strength, and balance impairment. From a practical perspective, assessment of loneliness may inform about individuals at risk of worse physical function and ultimately falls, limitations in activities of daily living, cognitive impairment and mortality. These individuals may benefit from interventions directed toward the promotion of physical function such as physical activity programs. Furthermore, interventions directed toward the reduction of loneliness may lead to better physical function and positive health and cognitive outcomes over time.

Acknowledgments

The Health and Retirement Study (HRS) is sponsored by the National Institute on Aging (NIA-U01AG009740) and conducted by the University of Michigan. The HRS was approved by the University of Michigan IRB. The Midlife in the United States (MIDUS) is sponsored by the MacArthur Foundation Research Network on Successful Midlife Development, the National Institute on Aging (P01-AG020166; U19-AG051426), and grants from the General Clinical Research Centers Program (M01-RR023942, M01-RR00865) and the National Center for Advancing Translational Sciences (UL1TR000427). The MIDUS Study was approved by the Education and Social/Behavioral Sciences and the Health Sciences IRB at the University of Wisconsin-Madison. Funding for the English Longitudinal Study of Ageing is provided by the National Institute of Aging [grants 2RO1AG7644-01A1 and 2RO1AG017644] and a consortium of UK government departments coordinated by the Office for National Statistics. The National Research Ethics Service approved ELSA. The National Health and Aging Trends Study (NHATS) is sponsored by the National Institute on Aging (grant number NIA U01AG032947) through a cooperative agreement with the Johns Hopkins Bloomberg School of Public Health. The NHATS was approved by the Johns Hopkins Bloomberg School of Public Health IRB. The Wisconsin Longitudinal Study (WLS) has been supported principally by the National Institute on Aging (AG-9775, AG-21079, AG-033285, and AG-041868), with additional support from the Vilas Estate Trust, the National Science Foundation, the Spencer Foundation, and the Graduate School of the University of Wisconsin-Madison. The WLS received approval from the Health Sciences IRB at University of Wisconsin–Madison. The National Health, Social Life and Aging Project (NSHAP) is supported by the National Institutes of Health, including the National Institute on Aging, the Office of Women's Health Research, the Office of AIDS Research, and the Office of Behavioral and Social Sciences Research (grants R01 AG021487, R37 AG030481, R01 AG033903, R01 AG043538, and R01 AG048511). NSHAP was approved by the Social and Behavioral Sciences IRB at the University of Chicago and the NORC IRB.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The research reported in this publication was supported by the National Institute on Aging of the National Institutes of Health (grant numbers R01AG068093, R01AG053297). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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Data availability statement

HRS data are publicly available at http://hrsonline.isr.umich.edu/. MIDUS data can be accessed at http://midus.wisc.edu/index.php. ELSA data are available from the UK Data Service (UKDS, https://www.ukdataservice.ac.uk/). NHATS data are available for public download at: http://www.nhats.org. WLS data are available at https://researchers.wls.wisc.edu/. Information on how to access the NSHAP data can be found at: http://www.norc.org/Research/Projects/Pages/national-social-life-health-and-aging-project.aspx.

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