

Supplementary Table S1. Longitudinal validity of motor fitness and flexibility tests for falls and hip fracture risk in adults and older adults.

Author	Participants	Sample age, years (Range)	Follow-up	Fitness test	Health outcomes	Main outcomes and conclusions
Kang et al. 2017 [1]	Females= 307 Males= 234	67.4±5.6 (60-86)	1 year	Gait speed (4m)	Falls	Slower gait speed (<0.9m/s): HR= 1.00 (0.99–1.01). The 4m gait test was not associated with falls.
Quach et al. 2011 [2]	Females= 487 Males= 276	78.1±5.4	1.5 years	Gait speed (4m)	Falls	Slower gait speed (<0.6m/s), indoor falls: IRR=2.17 (1.33–3.55). Faster gait speed, outdoor falls: IRR=2.11 (1.40–3.16). There was a nonlinear, U-shaped relationship between gait speed and falls. Those with faster and slower gait speeds were at highest risk of falls.
Callisaya et al. 2016 [3]	Females= 266 Males= 243	74.9±6.8 (60-105)	2 years	Gait speed (4.2m, 7m, 8.5m)	Falls	Slower gait speed (<0.8m/s): RR=1.30 (1.14-1.47). Slower gait speed predicted falls.
Luukinen et al. 1995 [4]	Females= 640 Males= 376	76.1±4.9 (70-92)	2 years	Step length (5m)	Falls	Short step length (<0.45m): RR=1.6 (1.04-2.46). A shorter step length predicted risk of falling.
Abu et al. 2018 [5]	Females= 180 Males=145	67.67±5.5 (60-89)	½ year	Gait speed (6m)	Falls	Slower gait speed: Mean (SD)= 1.06 (0.25), $p=0.20$. The 6m gait speed test was not associated with falls.
Kwan et al. 2012 [6]	Females= 120 Males= 160	74.9±6.4 (65–91)	2 years	Gait speed (6m)	Falls	Slower gait speed: IRR= 0.95 (0.60–0.94). Slower gait speed did not predict falls.
Muraki et al. 2013 [7]	Females= 1470 Males= 745	68.5±11.3	3 years	Gait speed (6m)	Falls	Slower gait speed (0.1m/s decrease), men: OR=1.15 (1.09–1.23), and women: OR=1.05 (1.01–1.10). Slower gait speed predicted falls.
Sanders et al. 2016 [8]	Females= 2179 Males= 1933	74.5±5.8 (≥65)	13 years; 6 years; 21 years	Gait speed (6m)	Falls	Slower gait speed (<0.71m/s): HR=1.3 (1.0-1.5). Slow gait speed predicted falls.

Luukinen et al. 1995 [4]	Females= 640 Males= 376	76.1±4.9 (70-92)	2 years	Gait speed (10m)	Falls	Slower gait speed (<0.77m/s): RR= 2.3 (1.57-3.48). Slow gait speed was an independent risk factor for recurrent falling.
Doi et al. 2013 [9]	Females= 42 Males= 15	79.7±8.2 (≥65)	1 year	Gait speed (10m)	Falls	Slower gait speed (<0.63m/s): OR=0.02 (0.00–0.23). Gait speed predicted risk of falling.
Stenhagen et al. 2013 [10]	Females= 840 Males= 923	(60-93)	3-6 years	Gait speed (15m)	Falls	Slower gait speed: OR=1.77 (1.28–2.46). Slow gait speed predicted falls.
Dargent-Molina et al. 1999 [11]	Females= 5895	80.5±3.8 (≥75)	2 years	Gait speed (6m)	Hip fracture	Slower gait speed: RR=1.8 (1.5–2.0). Gait speed may be a predictor of risk of hip fracture.
Kauppi et al. 2014 [12]	Females= 1331 Males= 969	66.38±8.24 (≥55)	10 years	Gait speed (6.1m)	Hip fracture	Slower gait speed (<0.40m/s): HR=0.70 (0.54–0.92). Gait speed predicted hip fracture.
Wihlborg et al. 2015 [13]	Females= 1044	75.2±0.2	10 years	Gait speed (30m)	Hip fracture	Slower gait speed (<1.3m/s): HR=1.37 (1.14–1.64). Gait speed predicted hip fracture.
Ersoy et al. 2009 [14]	Females= 125	61.4±7.9 (50-79)	½ year	Postural balance (Berg Balance Scale; one-leg stance, eyes open, ≥5s)	Falls	Balance (≤52 points): OR=6.19 (1.32–28.94). Failing one-leg stance (<5s): 0.24 (0.06-1.03). Worse Berg Balance performance predicted falls.
Muir et al. 2010 [15]	Females= 33 Males= 57	79.7±4.8 (60-90)	1 year	Postural balance (Berg Balance Scale)	Falls	Balance impairment: RR=2.00 (1.13–3.56). Impairment balance was a predictor of falls.
Luukinen et al. 1995 [4]	Females= 640 Males= 376	76.1±4.9 (70-92)	2 years	Postural balance (Tinetti Scale)	Falls	Balance (>7 points): RR= 2.9 (1.73-4.92). Impairment balance predicted falls.
Austin et al. 2007 [16]	Females= 1282	±75.2 (70-85)	3 years	Postural balance (tandem stance, eyes open and closed, ≥10s)	Fear of falling	Poor balance, eyes open: OR= 1.78 (1.38–2.28). Poor balance, eyes closed: 1.87 (1.44–2.42). Poor balance predicted developing fear of falling.
Kwan et al. 2012 [6]	Females= 120	74.9±6.4 (65–91)	2 years	Postural balance (near-tandem stance,	Falls	Worse near-tandem stance performance: 0.80 (0.65–0.99). Worse one-leg stance performance: IRR= 0.78 (0.62–0.99).

	Males= 160			eyes open and closed, ≥ 30 s; one-leg stance, eyes open, ≥ 5 s)		Poor balance predicted risk of falls.
Vellas et al. 1997 [17]	Females= 156 Males= 111	72 \pm 6.1 (≥ 60)	3 years	Postural balance (one-leg stance, eyes open, ≥ 5 s)	Falls and injurious falls	Impaired one-leg stance: RR=2.13 (1.04-4.34), for injurious falls. One-leg test predicted injurious falls but not falls.
Mulasso et al. 2017 [18]	Females= 119 Males= 73	73.0 \pm 6.2 (≥ 65)	1 year	Postural balance (one-leg stance, eyes open, 60s)	Falls	One-leg stance: OR=0.99 (0.97–1.01). The one-leg standing balance test was not associated with falls.
Nitz et al. 2013 [19]	Females= 449	59.3 \pm 10.6 (40-80)	9 years	Postural balance (bipedal stance, eyes open and closed; one-leg stance, eyes open, 10s. Force platform)	Falls	Unsteady in bipedal stance, eyes closed: OR=1.99 (1.18–3.38), for single falls. Unsteady in bipedal stance, eyes closed: OR=4.21 (1.79–9.92), for multiple falls. Impairment balance detected potential fallers.
Swanenburg et al. 2010 [20]	Females= 225 Males= 45	73 \pm 7 (60-90)	1 year	Postural balance (bipedal stance, eyes open and closed, 20s. Force platform)	Falls	Amplitude of in medial–lateral directions during single-task condition: OR=21.8 (3.19-149.25). Impairment balance predicted multiple falls.
Maki et al. 1994 [21]	Females= 83 Males= 17	83 \pm 6 (62-96)	1 year	Postural balance (bipedal stance, eyes open and closed, 30s. Force platform)	Falls	Lateral spontaneous-sway amplitude (eyes closed): Mean (SD)=3.35 (2.29), $p=0.004$. Postural balance predicted future risk of falling with moderate accuracy.
Pajala et al. 2008 [22]	Females= 434	(63–76)	1 year	Postural balance (side-by-side, eyes open and closed; tandem stance and semi-tandem stance, eyes open; 30s. Force platform)	Falls	Inability to complete the tandem stance: IRR=4.33 (2.17–8.52). Impairment balance predicted risk of falling.
Frames et al. 2018 [23]	Females= 65 Males= 33	Non obese:	2 years	Postural balance (bipedal stance, eyes	Falls	Obese fallers had higher sway range than non-fallers ($p=0.001$, $F=7.44$), root mean square values ($p=0.002$, $F=6.62$) and SD

		77.41±8.49 Obese: 72.68±7.40		open and closed, 60s. Force platform and an inertial measurement unit affixed at the sternum)		values ($p=0.002$, $F=6.62$) from the force plate center of pressure time series. Obese fallers had higher sway area than non-fallers (ellipse area, $p=0.003$, $F=5.89$; and circular area $p<0.0002$, $F=8.97$), mean velocity ($p=0.011$, $F=4.56$), mean radius ($p<0.0001$, $F=10.47$) and mean path length of center of pressure ($p=0.011$, $F=4.56$). The postural balance test may help detecting fall risk in elderly persons who are obese.
Wihlborg et al. 2015 [13]	Females= 1044	75.2±0.2	10 years	Postural balance (one-leg stance, eyes open and closed, ≥60s)	Hip fracture	Failing the balance test: HR=1.98 (1.18–3.32). Balance predicted hip fracture.
Abu et al. 2018 [5]	Females= 180 Males=145	67.7±5.5 (60-89)	½ year	Timed Up&Go (TUG)	Falls	TUG (>8s): IQR: 4.8-17.5, with a sensitivity of 83.95%% (74.1-91.2) and specificity of 32.43% (26.3-39.0). The TUG test had predictive validity for risk of falls.
Asai et al. 2020 [24]	Females= 425 Males= 224	±76.2 (≥60)	1 year	TUG	Falls	Worse TUG performance (>7s): OR=1.14 (1.01-1.29), $p=0.032$. Worse TUG predicted risk of falls.
Austin et al. 2007 [16]	Females= 1282	±75.2 (70-85)	3 years	TUG	Fear of falling	TUG (>10s): mean=9.5; IQR=8.1-11.0, for fear of falling, and mean=10.8; IQR=8.7-21.3, for persistent fear. The TUG test predicted fear of falling.
Clemson et al. 2015 [25]	Females= 533 Males= 467	±73.4 (65-94)	11 years	TUG	Falls	TUG (>12s): HR=1.02 (1.01-1.04). Worse TUG performance predicted injurious falls.
Doi et al. 2013 [9]	Females= 42 Males= 15	79.7±8.2 (≥65)	1 year	TUG	Falls	TUG (>21s): OR=1.08 (1.02–1.15). The TUG test predicted risk of falling.
Ersoy et al. 2009 [14]	Females= 125	61.4±7.9 (50-79)	½ year	TUG	Falls	TUG (>13s): OR= 4.55 1.95-10.61. The TUG test predicted falls.
Kang et al. 2017 [1]	Females= 307 Males= 234	67.4±5.6 (60-86)	1 year	TUG	Falls	TUG (>16s): HR=1.07 (1.00–1.14). The TUG test predicted falls.
Kwan et al. 2012 [6]	Females= 120	74.9±6.4 (65–91)	2 years	TUG	Falls	TUG (>11s): IRR=1.27 (1.04–1.56). The TUG test predicted risk of falling.

Mulasso et al. 2017 [18]	Males= 160 Females= 119 Males= 73	73.0±6.2 (≥65)	1 year	TUG	Falls	TUG (>11s): OR=1.076 (0.94–1.21) The TUG test was not associated with falls.
Nitz et al. 2013 [19]	Females= 449	59.3±10.6 (40-80)	9 years	TUG	Falls	TUG (>8s): 1.32 (1.15, 1.51), for multiple falls. The TUG test predicted multiple falls.
Luukinen et al. 1995 [4]	Females= 640 Males= 376	76.1±4.9 (70-92)	2 years	Range Of Motion (ROM) (Hip and knee ROM)	Falls	Hip motion reduced (<120°): RR= 1.4 (0.89-2.04). Knee motion reduced (<100°): 1.4 (0.97-2.04). Reduced ROM was not associated with falls.

HR, Hazard Ratio; IRR, Incidence Rate Ratio; IQR, Interquartile Range; OR, Odds Ratio; ROM, Range Of Motion; RR, Relative Risk; SD, Standard Deviation; TUG, Timed Up&Go test.

Supplementary Table S2. Longitudinal validity of motor fitness and flexibility tests for cognitive outcomes in adults and older adults.

Author	Participants	Sample age, years (Range)	Follow-up	Fitness test	Health outcomes	Main outcomes and conclusions
Ojagbemi et al. 2015 [26]	2149 participants (<i>unspecified sex</i>)	(≥65)	2 years	Gait speed (3m, 4m)	Cognitive decline	Slower gait speed (>6.52s in 3m; >8.70s in 4m, in total): HR=0.77 (0.43–1.2). Change in gait speed was a significant predictor of reduced cognitive performance.
Hoogendijk et al. 2020 [27]	Females= 2221 Males= 1999	±72.0 (≥55)	9-25 years	Gait speed (4m, 6m, 30m)	Cognitive decline	Slower gait speed (<0.82m/s): HR=1.23 (1.00-1.50), $p<0.05$. Slower gait speed predicted cognitive decline.
Sanders et al. 2016 [8]	Females= 2179 Males= 1933	74.5±5.8 (≥65)	13 years; 6 years; 21 years.	Gait speed (6m)	Persistent cognitive decline	Slower gait speed (<0.71m/s): HR= 2.1 (0.8-5.8). Slow gait speed did not predict persistent cognitive decline.
Stijntjes et al. 2017 [28]	Females= 1647 Males= 1332	(55-90)	5-12 years	Gait speed (6m)	Cognitive decline	No association was found for the group of 55–64 years. Group of 65–74 years: slower gait speed (<0.86m/s) was associated with a steeper decline in global cognitive function ($p<0.05$). Group of 75–85 years: slower gait speed (<0.69m/s) was associated with a steeper decline on each of the cognitive domains ($p<0.04$). Slow gait speed was a marker for cognitive impairment in adults over 65years old.
Tian et al. 2019 [29]	Females= 93 Males= 108	79.3±6.3	5.2 years	Gait speed (6m, 400m)	Cognitive impairment/ Alzheimer's disease	Slower gait speed (<1.02m/s): $\beta=-0.22$ (-0.47-0.04), $p<0.05$. Slower gait speed predicted cognitive impairment/Alzheimer's disease.
Buracchio et al. 2010 [30]	Females= 118 Males= 86	79.0±8.8 (≥65)	20 years	Gait speed (9.14m)	Mild cognitive impairment	Gait speed rate of change before converters to mild cognitive impairment= -0.005 m/s/year (-0.010-0.000), $p=0.07$. A decrease of 0.02 m/s/year ($p=0.001$) in gait speed may predict mild cognitive impairment. Changes in gait speed may predict cognitive impairment.

Sakurai et al. 2017 [31]	Females= 106 Males= 117	72.6±4.9 (65–85)	1 year	Gait speed (10m fast gait speed)	Subjective memory complaints	Gait speed (<2.0m/s): OR=0.84 (0.39–1.81). Gait speed did not predict developing subjective memory complaints.
Bullain et al. 2016 [32]	Females= 402 Males= 176	93.3±2.6 (≥90)	2.6 years	Postural balance (one- leg stance, eyes open, 10s)	Dementia	Unable to complete balance test: HR=3.20 (1.91–5.37). Poor balance may predict dementia.
Doi et al. 2019 [33]	Females= 2124 Males= 1962	±72.0 (≥65)	3.6 years	Timed Up&Go (TUG)	Dementia	Worse TUG performance: HR=1.54 (1.01-2.35), <i>p</i> =0.04. Worse TUG predicted incidence of dementia.
Donoghue et al. 2017 [34]	Females= 1169 Males= 1081	72.4±6.0 (65–98)	5.9 years	TUG	Cognitive decline	TUG (>10.5s): β =1.00 (0.99-1.00). The TUG test was not significant.

β , standardized regression coefficient; B, non-standardized regression coefficient; SE, standard Error; HR, Hazard Ratio; OR, Odds Ratio; TUG, Timed Up&Go test.

Supplementary Table S3. Longitudinal validity of motor fitness and flexibility tests for depressive symptoms and well-being in adults and older adults.

Author	Participants	Sample age, years (Range)	Follow-up	Fitness test	Health outcomes	Main outcomes and conclusions
Veronese et al. 2017 [35]	Females= 485 Males= 1247 3615	69.3±6.7 (≥50)	2 years	Gait speed (2.5m)	Depressive symptoms	Slower gait speed: OR=1.82 (1.00–3.32). Slow gait speed may predict depression.
Briggs et al. 2019 [36]	participants (<i>unspecified sex</i>)	±63.3 (≥50)	2-4 years	Gait speed (4m)	Depressive symptoms	Slower gait speed (<1.3m/s): OR=1.54 (1.08-2.19), <i>p</i> <0.003. Slower gait speed predicted depression.
Veronese et al. 2017 ^b [37]	Females= 533 Males= 437	72.5±6.0 (65-96)	4 years	Gait speed (4m)	Depressive symptoms	Slower gait speed (<0.80m/s), women: OR=1.55 (0.90-2.68). Slower gait speed (<0.80m/s), men: OR=2.22 (1.16-4.28). Slow walking speed predicted depression only in men.
Sanders et al. 2012 [38]	Females= 686 Males= 773	68.9±8.5 (≥65)	16 years	Gait speed (6m)	Depressive symptoms	Slower gait speed (<0.55m/s), women: HR=1.22 (0.87–1.72). Slower gait speed (<0.55 m/s), men: HR=1.67 (1.08–2.57). Slow gait speed predicted depressive symptoms only in men.
Davis et al. 2015 [39]	Females= 196 Males= 112	82.5±6.5 (≥70)	1 year	Timed Up&Go (TUG)	Well-being	TUG (>20s): β =-0.30(-0.45, -0.15). The TUG test was a predictor of well-being decrease.

HR, Hazard Ratio; OR, Odds Ratio; β , standardized regression coefficient; TUG, Timed Up&Go test.

Supplementary Table S4. Longitudinal validity of motor fitness and flexibility tests for mobility limitations and disability risk in adults and older adults.

Author	Participants	Sample age, years (Range)	Follow-up	Fitness test	Health outcomes	Main outcomes and conclusions
Makizako et al. 2015 [40]	Females= 463 Males= 485	78.5±3.7 (≥75)	1.25 years	Gait speed (2.4m)	Disability in instrumental activities of daily living (IADL)	Slower gait speed, women (<0.9m/s): OR=0.97 (0.95–0.99). Slower gait speed, men (<1.1m/s): OR=0.98 (0.96–0.99). Gait speed predicted disability in IADL.
Heiland et al. 2018 [41]	Females= 1154 Males= 602	70.6±9.6 (≥60)	9 years	Gait speed (2.4m or 6m)	Disability in IADL	Gait speed limitation (<0.8m/s): HR=3.11 (1.92-5.03). Gait speed predicted disability in IADL.
Abe et al. 2019 [42]	Females= 463 Males= 510	74.6±5.5 (≥65)	4.4 years	Gait speed (5m)	Disability in IADL	Slower gait speed (<1.25m/s): HR=0.86 (0.18-0.92), <i>p</i> <0.001. Slower gait speed predicted disability in IADL.
Makizako et al. 2010 [43]	Females= 146 Males= 119	78±5.6 (68-96)	4 years	Gait speed (5m)	Disability in IADL	Slower gait speed (≥5.6s in total), women: OR=5.31 (1.63-17.22). Slower gait speed, men (≥4.6s in total): OR=1.58 (0.94-2.63). Gait speed predicted disability in IADL only in older women.
Adachi et al. 2019 [44]	Females= 417 Males= 99	±79 (76-82)	2 years	Gait speed (10m)	Disability in IADL	Slower gait speed (<1.13 m/s): AUC=0.80 (0.74-0.86). Slow gait speed predicted disability in IADL.
Laukkanen et al. 2000 [45]	Females= 261 Males= 127	75 and 80	5 years	Gait speed (10m)	Disability in IADL	Slower gait speed: <i>t</i> -value=-0.23, SE=0.06. Reduced gait speed predicted disability in IADL.
Nakamoto et al. 2015 [46]	Females= 466 Males= 495	(40–79)	14 years	Gait speed (10m)	Disability in IADL	Slower gait speed, women (>1 SD increase): OR=0.68 (0.50-0.92). Slower gait speed, men (>1 SD increase): OR= 0.78 (0.59-1.04). Gait speed predicted disability in IADL.
Doi et al. 2020 [47]	Females= 1944 Males= 1752	71.2±4.9 (≥65)	4.1 years	Gait speed (2.4 m)	Mobility disability	Slower gait speed (<1.1m/s): HR=2.06 (1.65-2.57), <i>p</i> <0.001. Slower gait speed predicted mobility disability.
Brach et al. 2012 [48]	Females= 336 Males= 216	79.4±4.1 (≥65)	1 year	Gait speed (4m)	Mobility disability	Slower gait speed (<1m/s): sensitivity, AUC=0.61 (0.47-0.73), specificity, AUC= 0.60 (0.55-0.65). Slow gait may be a predictor of mobility disability.

Deshpande et al. 2013 [49]	622 participants (<i>unspecified sex</i>)	(50-85)	3 years	Gait speed (7m)	Mobility disability	Slower gait speed (<1.2m/s): OR= 24.95 (6.03-103.13). Slower gait speed predicted mobility disability.
Rosso et al. 2019 [50]	Females= 171 Males= 166	78.5±2.9 (70-79)	8 years	Gait speed (20m)	Mobility Disability	Slower gait speed (<1.08m/s): HR=0.82 (0.77-0.86). Slower gait speed predicted mobility disability.
Jung et al. 2018 [51]	Females= 746 Males= 602	±76 (≥65)	5.38 years	Gait speed (4m)	Frailty	Slower gait speed (<0.8m/s): β =-0.534, p =0.001. Gait speed may predict frailty status. Faster gait speed, women (<1.5m/s): R^2 =0.37; p <0.001, for greater mobility/autonomy.
Breton et al. 2014 [52]	Females= 652 Males= 613	±73 (68-82)	5 years	Gait speed (4m)	Functional autonomy	Faster gait speed, men (<1.7m/s): R^2 =0.28; p <0.001, for with greater mobility/autonomy. Gait speed changes could moderately predict functional autonomy, especially in women.
Makizako et al. 2010 [43]	Females= 146 Males= 119	78±5.6 (68-96)	4 years	Postural balance (one-leg stance, eyes open, 60s)	Disability in IADL	Balance, women: OR=0.98 (0.95-1.02). Balance, men: OR=0.98 (0.95-1.00). Balance did not predict disability in IADL. A 1-SD increase in sway area with eyes open, women: OR=1.49 (1.17–1.90).
Nakamoto et al. 2015 [46]	Females= 466 Males= 495	(40–79)	14 years	Postural balance (bipedal stance, eyes open, 60s. Force platform)	Disability in IADL	A 1-SD increase in sway area with eyes open, men: OR= 0.92 (0.71–1.20). Sway area increases might predict disability in IADL, only in women.
Breton et al. 2014 [52]	Females= 652 Males= 613	±73 (68-82)	5 years	Postural balance (one-leg stance, eyes open, 60s)	Functional autonomy	Balance, women: R^2 =0.37; p <0.001. Balance, men: R^2 =0.28; p <0.001. Balance could moderately predict functional autonomy, especially in women.
Savva et al. 2013 [53]	Females= 925 Males= 889	±70 (≥65)	4 years	TUG	Frailty	TUG (>16s): AUC=0.87 for frailty. TUG (>12s): AUC=0.73 for prefrailty. The TUG test identified prefrailty and frailty.

Breton et al. 2014 [52]	Females= 652 Males= 613	± 73 (68-82)	5 years	TUG	Functional autonomy	TUG (>11s), women: β (SE)= 0.56 (0.13); $p<0.001$. TUG (>10.5s), men: β (SE)= 0.42 (0.12); $p<0.001$. The TUG test predicted decline in functional autonomy.
Ward et al. 2016 [54]	Females= 261 Males= 130	76.5 ± 7.1 (≥ 65)	1-2 years	Range Of Motion (ROM) (knee flexion- extension, ankle)	Mobility disability	Restricted knee flexion: OR=2.03 (1.24-3.35). ROM predicted mobility disability.
Ward et al. 2016 [54]	Females= 261 Males= 130	76.5 ± 7.1 (≥ 65)	1-2 years	Speed of movement (leg velocity, reaction time, rapid leg coordination)	Mobility disability	Slower leg velocity: OR=2.35 (1.21-4.58). Leg velocity predicted mobility disability.
Adachi et al. 2019 [44]	Females= 417 Males= 99	± 79 (76-82)	2 years	Maximum step length	Disability in IADL	Maximum step length: AUC=0.81 (0.75-0.87). Maximum step length was a predictor for declined walking speed and predicted disability in IADL. Disability to complete the stair mounting test, women (40 cm): RR=4.14, $p=0.09$.
Schroll et al. 1997 [55]	Females= 146 Males= 113	(75-80)	5 years	Stair mounting (40-50cm step)	Disability in IADL	Disability to complete the stair mounting test, men (50 cm): RR=4.07, $p<0.001$. Inability to mount a 50cm step was a predictor of disability in IADL in men.

β , standardized regression coefficient; IADL, Disability in instrumental activities of daily living; AUC, Area Under the Curve; HR, Hazard Ratio; OR, Odds Ratio; ROM, Range Of Motion; RR, Relative Risk; SD, Standard Deviation; SE, Standard Error; TUG, Timed Up&Go test.

Supplementary Table S5. Longitudinal validity of motor fitness and flexibility tests for CVD risk and mortality in adults and older adults.

Author	Participants	Sample age, years (Range)	Follow-up	Fitness test	Health outcomes	Main outcomes and conclusions
Heiland et al. 2018 [41]	Females= 1154 Males= 602	70.6±9.6 (≥60)	9 years	Gait speed (2.4m or 6m)	CVD risk	Slower gait speed (<0.8m/s): HR=1.09 (1.02–1.17), for group <78 years. Slower gait speed (<0.8m/s): HR= 0.98 (0.92–1.03), for group ≥78 years. Slow gait speed predicted CVD risk only in adults <78 years. Slower gait speed, women (<1.09m/s), men (<1.26m/s): HR= 2.19 (1.54–3.11).
Elbaz et al. 2013 [56]	Females= 1817 Males= 4450	(35-55)	6.4 years	Gait speed (2.4m)	All-cause mortality	Gait speed was a marker of mortality risk. Slower gait speed (<0.8m/s): AUC=0.85 (0.83-0.87), for 3-years mortality; AUC=0.85 (0.83-0.86), for 5-years mortality.
Zucchelli et al. 2019 [57]	Females= 2182 Males= 1181	74.7±11.2 (≥60)	3-5 years	Gait speed (2.4m, 6m)	All-cause mortality and unplanned hospitalization	Slower gait speed (<0.8m/s): AUC=0.70 (0.68-0.72) for 3-years hospitalization. Slower gait speed predicted mortality and unplanned hospitalization.
Andrasfay et al. 2020 [58]	Females= 430 Males= 457	70.1±8.7 (≥60)	4 years	Gait speed (3m)	All-cause mortality	A 1-SD increase in gait speed (<0.1m/s): HR=0.70 (0.52-0.94), $p<0.05$. Slower gait speed predicted mortality risk.
Camargo et al. 2016 [59]	Females= 1175 Males= 1001	62±9 (35-84)	11 years	Gait speed (4m)	Stroke	Slower gait speed (<1.0m/s): HR=1.13 (0.88–1.45). Slow gait speed was not significantly associated with risk of stroke.
Jung et al. 2018 [51]	Females= 746 Males= 602	±76 (≥65)	5.38 years	Gait speed (4m)	All-cause mortality	Gait speed (<0.8m/s): HR=3.37 (1.25–9.08). Gait speed may predict mortality.
Niiranen et al. 2019 [60]	Females= 1852 Males= 1601	54.7±9.2 (45-74)	8 years	Gait speed (4m)	All-cause mortality and Cardiovascular Disease (CVD) risk	Slower gait speed (<1.29m/s): women, HR=3.72 (2.53-5.47), $p<0.001$; men, HR=2.57 (1.77-3.74), $p<0.001$, for mortality. Slower gait speed (<0.99m/s): HR=2.95 (2.26-3.85), $p<0.05$, for CVD risk.

						Slower gait speed predicted incidence of CVD risk and mortality.
Hoogendijk et al. 2020 [27]	Females= 2221 Males= 1999	± 72.0 (≥ 55)	9-25 years	Gait speed (4m, 6m, 30m)	All-cause mortality	Slower gait speed ($<0.82\text{m/s}$): HR=1.70 (1.30-6.28), $p<0.05$. Slower gait speed predicted mortality.
Abe et al. 2019 [42]	Females= 463 Males= 510	74.6 ± 5.5 (≥ 65)	4.5 years	Gait speed (5m)	All-cause mortality	Slower gait speed ($<1.25\text{m/s}$): HR=0.93 (0.88-1.00), $p=0.038$. Slower gait speed mortality risk. Slower gait speed, women ($<0.94\text{m/s}$), men ($<1.10\text{m/s}$): HR=1.95 (1.39-2.73), all-cause death.
Nofuji et al. 2016 [61]	1085 participants (<i>unspecified sex</i>)	(65-89)	10.5 years	Gait speed (5m)	All-cause mortality and cause-specific mortality ((CVD), cancer, other-causes and unknown causes))	Slower gait speed, women ($<0.94\text{m/s}$), men ($<1.10\text{m/s}$): HR=2.80 (1.55-5.05), CVD death. Slower gait speed women ($<0.94\text{m/s}$), men ($<1.10\text{m/s}$): HR=2.08 (1.14-3.77), other-cause death. Slow gait speed predicted all-cause, CVD, and other-cause mortality, but not cancer mortality.
Lee et al. 2017 [62]	Females= 407 Males= 504	65.3 ± 9.3	4.1 years	Gait speed (3m)	All-cause mortality and CVD risk	Slower gait speed ($<0.8\text{m/s}$): HR=1.3 (0.6–2.5), for mortality. Slower gait speed ($<0.8\text{m/s}$): HR=0.8 (0.2–3.3), for CVD risk. Not associations were found between gait speed and any studied variable.
Blain et al. 2010 [63]	Females= 1548	± 79 (77-81)	8 years	Gait speed (6m)	All-cause mortality	Slower gait speed ($<0.8\text{m/s}$): HR=1.33 (0.94-1.88). Slow gait speed predicted mortality.
Sabia et al. 2014 [64]	4016 participants (<i>unspecified sex</i>)	73.4 ± 4.7 (65–85)	12 years	Gait speed (6m)	All-cause mortality	Slower gait speed decline/year ($<-0.08\text{m/s}$): HR=1.40 (1.02-1.92). Fast gait speed decline predicted mortality.
Sanders et al. 2016 [8]	Females= 2179 Males= 1933	74.5 ± 5.8 (≥ 65)	13 years; 6 years; 21 years	Gait speed (6m)	All-cause mortality	Slower gait speed ($<0.71\text{m/s}$): HR=2.1 (1.6-2.6 45). Slow gait speed predicted mortality.
Georgiopoulou et al. 2016 [65]	Females= 1529 Males= 1406	73.6 ± 2.9 (70-79)	10 years	Gait speed (20m)	All-cause mortality and CVD risk	Slower gait speed ($<1.35\text{m/s}$): HR=0.34 (0.24-0.48), mortality. Slower gait speed ($<1.35\text{m/s}$): HR=0.36 (0.22-0.60), CVD. Slow gait speed test may predict mortality and CVD risk.

Idland et al. 2013 [66]	Females= 113	± 79.5 (75–92)	9 years	Gait speed (29m)	All-cause mortality	Slower gait speed (<1.1m/s): OR=0.05 (0.02-0.16). Slow gait speed predicted mortality risk.
Looker 2015 [67]	Females= 1475 Males= 1500	(≥ 50)	3 years	Gait speed (6.15m)	Mortality risk by dysmobility	Slower gait speed (<1.0m/s): HR=3.63 (2.69-4.90). Dysmobility (by slow gait speed) was associated with increased mortality risk.
Blain et al. 2010 [63]	Females= 1548	± 79 (77-81)	8 years	Postural balance (side-by-side, tandem stance, to complete 10-foot taps, eyes open, s)	All-cause mortality	Balance (≥ 4.6 s): HR= 1.67 (1.21-2.31). Poor balance predicted mortality.
Cooper et al. 2014 [68]	Females= 1411 Males= 1355	53	13 years	Postural balance (one-leg stance, eyes closed, 30s)	All-cause mortality	Unable to perform standing balance test: HR=3.40 (2.05- 5.63). Inability to perform balance test was a strongly predictor of mortality.
Nofuji et al. 2016 [61]	1085 participants (<i>unspecified sex</i>)	(65-89)	10.5 years	Postural balance (one-leg stance, eyes open, 60s)	All-cause mortality and cause-specific mortality (CVD, cancer, other- causes and unknown causes)	One-leg stance (<18 score): HR= 1.91 (1.39-2.63), all-cause death. One-leg stance (<18 score): HR= 2.67 (1.54-4.62), CVD death. One-leg stance (<18 score): HR= 2.60 (1.45-4.69), other-causes death. Poor balance predicted all-cause, CVD, and other-cause mortality, but not cancer mortality.
Idland et al. 2013 [66]	Females= 113	± 79.5 (75–92)	9 years	Dynamic balance (Functional reach test, cm)	All-cause mortality	Poorer functional reach: OR=0.92 (0.88-0.95). Poorer functional reach predicted mortality risk.
Bravell et al. 2017 [69]	Females= 343 Males= 242	66 \pm 9 (60-91)	19 years	Flexibility (Touch-toes test)	All-cause mortality	Touch-toes test: HR=0.99 (0.42-2.31). The predictive validity of this flexibility test was not significant.

CVD, Cardiovascular Disease; HR, Hazard Ratio; OR, Odds Ratio.

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