

S Table 1. Number of participants by physical activity status across waves 1–8

	Number of the participants by physical activity status (N (%))			
	No physical activity	Low (< 25 min)	Medium (25 – 43 min)	High (43 < min)
Wave 1 (2006)	5515 (59.8)	1190 (12.9)	1289 (14.0)	1221 (13.3)
Wave 2 (2008)	4813 (62.8)	691 (9.01)	1117 (14.6)	1046 (13.6)
Wave 3 (2010)	4400 (64.4)	630 (9.23)	896 (13.1)	902 (13.2)
Wave 4 (2012)	3904 (62.0)	514 (8.16)	980 (15.6)	903 (14.3)
Wave 5 (2014)	3741 (65.0)	559 (9.71)	821 (14.3)	638 (11.1)
Wave 6 (2016)	3365 (62.9)	602 (11.3)	793 (14.8)	638 (11.0)
Wave 7 (2018)	3132 (64.4)	490 (10.1)	735 (15.1)	507 (10.4)
Wave 8 (2020)	2572 (55.9)	601 (13.1)	747 (16.2)	683 (14.8)

S Table 2. Mean value of main variables across waves 1-8

	Number of participants	Age	Handgrip strength (kg)		Handgrip strength (kg)			
			Men	Women	By physical activity status			
					No physical activity	Low (< 25 min)	Medium (25 – 42 min)	High (42 < min)
Wave 1 (2006)	9215	60.7	32.5	19.9	24.5	26.9	26.6	27.7
Wave 2 (2008)	7675	62.6	31.1	19.5	23.9	25.6	25.5	26.6
Wave 3 (2010)	6828	64.1	30.2	18.8	23.0	24.8	25.3	26.5
Wave 4 (2012)	6306	65.6	31.2	19.4	23.6	24.9	26.0	27.5
Wave 5 (2014)	5760	66.9	31.6	20.2	24.8	24.7	25.7	27.4
Wave 6 (2016)	5352	68.4	31.6	20.3	24.6	25.3	26.3	27.4
Wave 7 (2018)	4865	69.9	31.1	19.9	24.3	24.0	25.8	27.2
Wave 8 (2020)	4610	71.3	30.1	19.7	23.2	23.4	25.9	27.0

S Table 3. Association of handgrip strength with different variables among Korean older adults

Variables		Estimate	SE	95% CI
Physical activity (30min/day)		0.39	0.05	0.29, 0.49 ***
Physical activity (30min/day) * wave		-0.01	0.01	-0.03, 0.01
Age		-0.24	0.00	-0.25, -0.23***
Sex	Men	Reference		
	Women	-10.9	0.11	-11.1, -10.7***
Education	Elementary school	Reference		
	Middle school	0.29	0.11	0.08, 0.05**
	High school	0.60	0.10	0.41, 0.80***
	College	0.91	0.14	0.65, 1.18***
BMI	Normal	Reference		
	Low	-1.27	0.15	-1.57, -0.97***
	Overweight	0.83	0.06	0.72, 0.94***
Smoking status	Non-smoker	Reference		
	Past smoker	-0.06	0.11	-0.27, 0.16
	Current smoker	0.08	0.11	-0.14, 0.30
Alcohol status	Non-alcohol	Reference		
	Past alcohol	-0.79	0.09	-0.97, -0.61 ***
	Current alcohol	-0.13	0.09	-0.30, 0.04
Self-reported health	Excellent	Reference		
	Very good	1.22	0.07	1.08, 1.36***
	Good	1.63	0.08	1.48, 1.77***
	Fair	2.16	0.11	1.94, 2.38***
	Poor	2.25	0.22	1.82, 2.68***
ADL disability (%)		-2.05	0.20	-2.43, -1.67***
IADL disability (%)		-0.14	0.10	-0.33, 0.05

- *** p < 0.001, ** p < 0.05

- BMI: Body mass index; ADL: Activities of daily living; IADL: Instrumental activities of daily living

- SE: Standard error; CI: Confidence interval

- Interaction between sex and physical activity (30 min/day) was significant (Estimate = -0.27, SE = 0.06, 95% CI: -0.38 to -0.16).

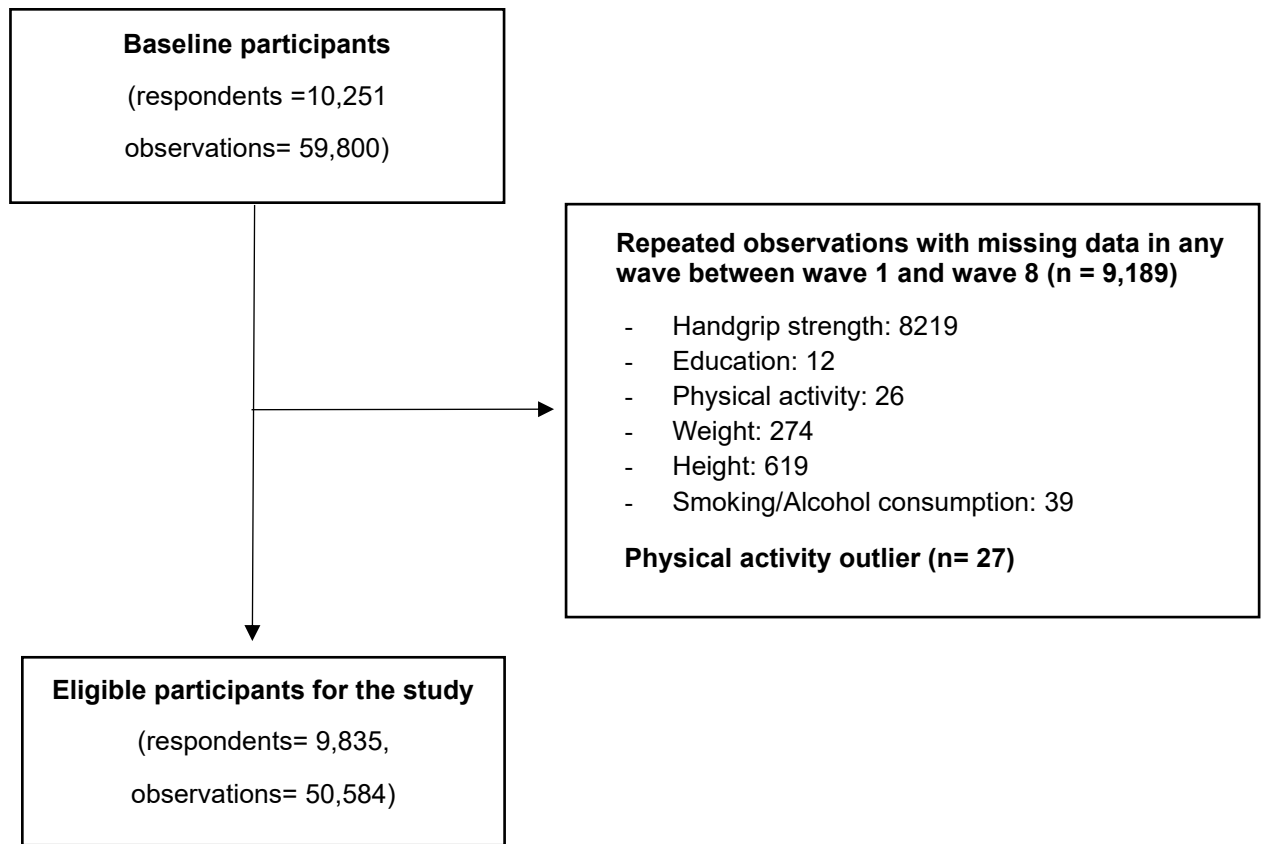
S Table 4. Results of interaction of age and physical activity status on handgrip strength

Variables	Men			Women		
	Estimate	SE	95% CI	Estimate	SE	95% CI
Age (56 – 65) * Low PA	-0.31	0.36	-1.01, 0.40	-0.17	0.23	-0.63, 0.29
Age (56 – 65) * Medium PA	0.18	0.38	-0.56, 0.92	-0.22	0.24	-0.70, 0.26
Age (56 – 65) * High PA	0.08	0.43	-0.77, 0.93	0.11	0.27	-0.42, 0.65
Age (66 – 75) * Low PA	-0.57	0.33	-1.22, 0.08	0.15	0.20	-0.24, 0.54
Age (66 – 75) * Medium PA	-0.01	0.34	-0.68, 0.66	0.47	0.21	0.05, 0.89**
Age (66 – 75) * High PA	0.45	0.40	-0.33, 1.23	0.56	0.27	0.03, 1.10**
Age (over 76) * Low PA	-0.47	0.36	-1.17, 0.23	-0.15	0.22	-0.59, 0.29
Age (over 76) * Medium PA	-0.42	0.36	-1.13, 0.28	0.01	0.24	-0.47, 0.48
Age (over 76) * High PA	-0.24	0.41	-1.04, 0.56	0.50	0.32	-0.12, 1.13

- This model was adjusted by the confounders which were suggested in Table 2.

- PA: Physical activity; SE: Standard error; CI: Confidence interval

- ** p< 0.05

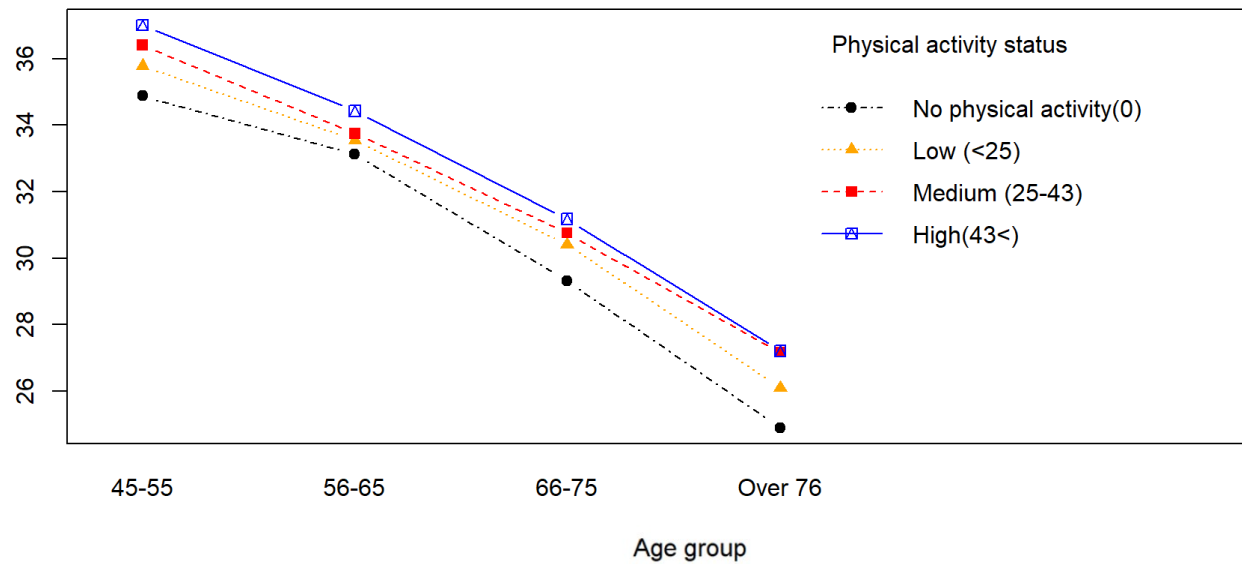


* Missing values and outliers were counted based on repeated measurements across waves 1 to 8 (total observations = 59,800), rather than on the number of baseline participants (n = 10,251).

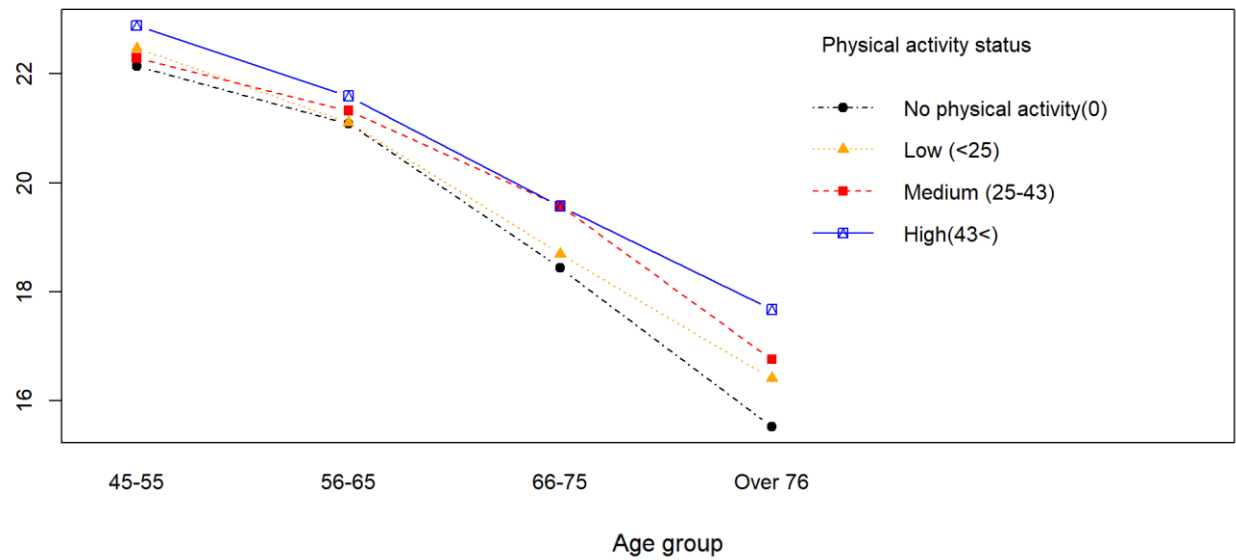
Wave (year)	Baseline (2006)	Participants with missing data on any of the variables (above table) were excluded from the analysis	Wave 1 (2006)	Wave 2 (2008)	Wave 3 (2010)	Wave 4 (2012)	Wave 5 (2014)	Wave 6 (2016)	Wave 7 (2018)	Wave 8 (2020)
Respondent	10,251		9215	7667	6826	6301	5759	5347	4864	4603
Observation	59,800		Total observations after excluding missing data: 50,584 (Includes participants with at least one follow-up)							

S Figure 1. Flow gram of study participants

(Men)

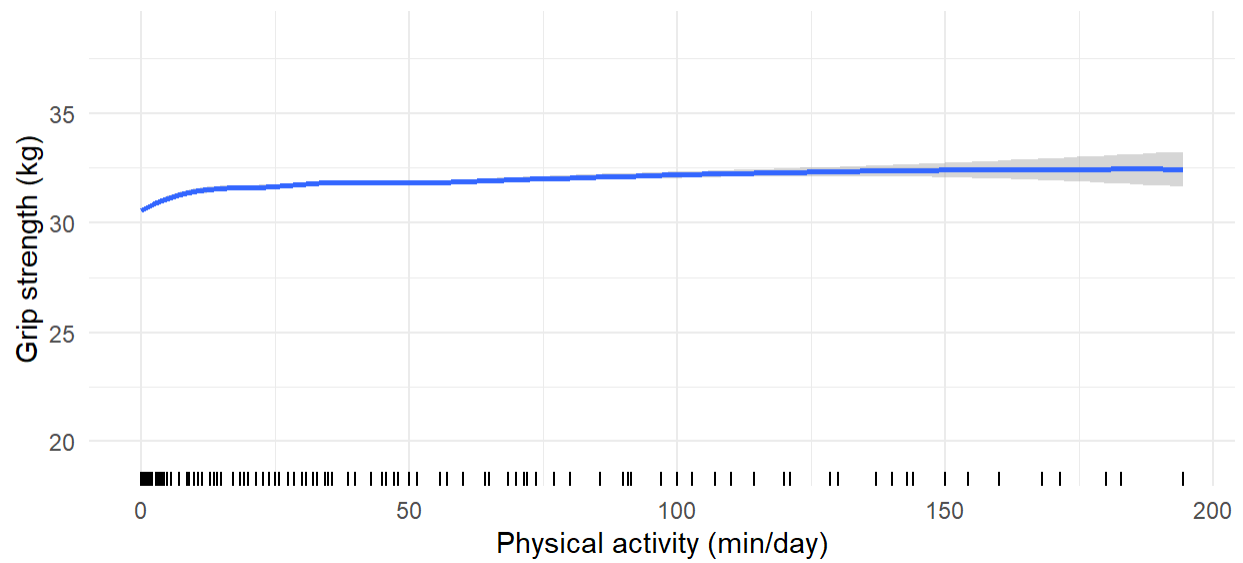


(Women)

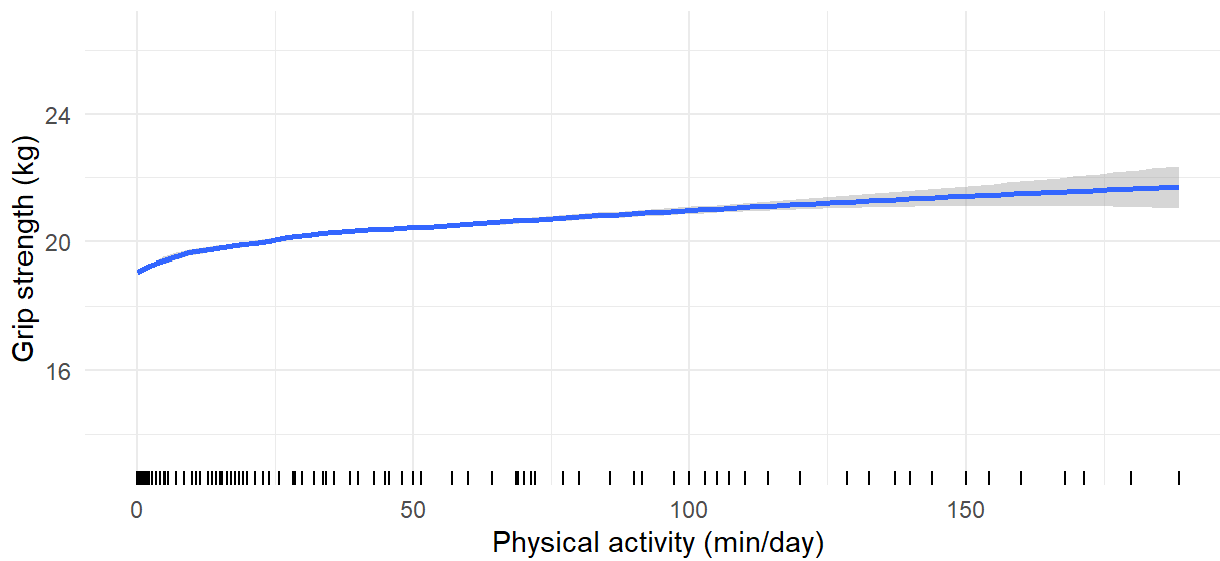


S Figure 2. Interaction plot of handgrip strength and age by physical activity status in older adults

(Men)



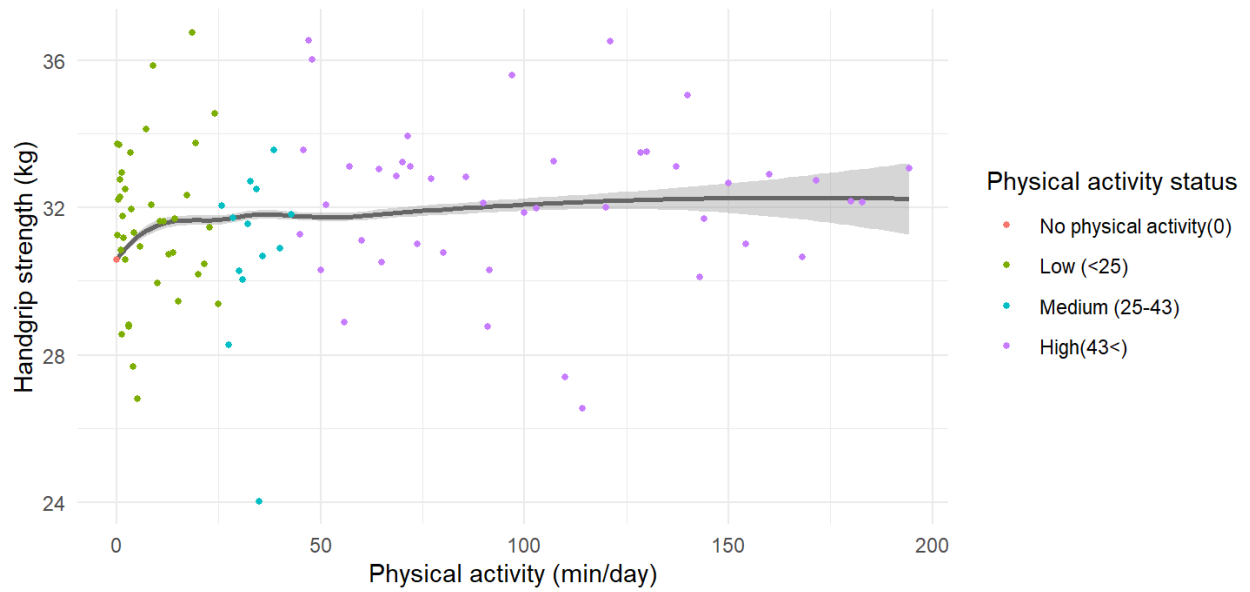
(Women)



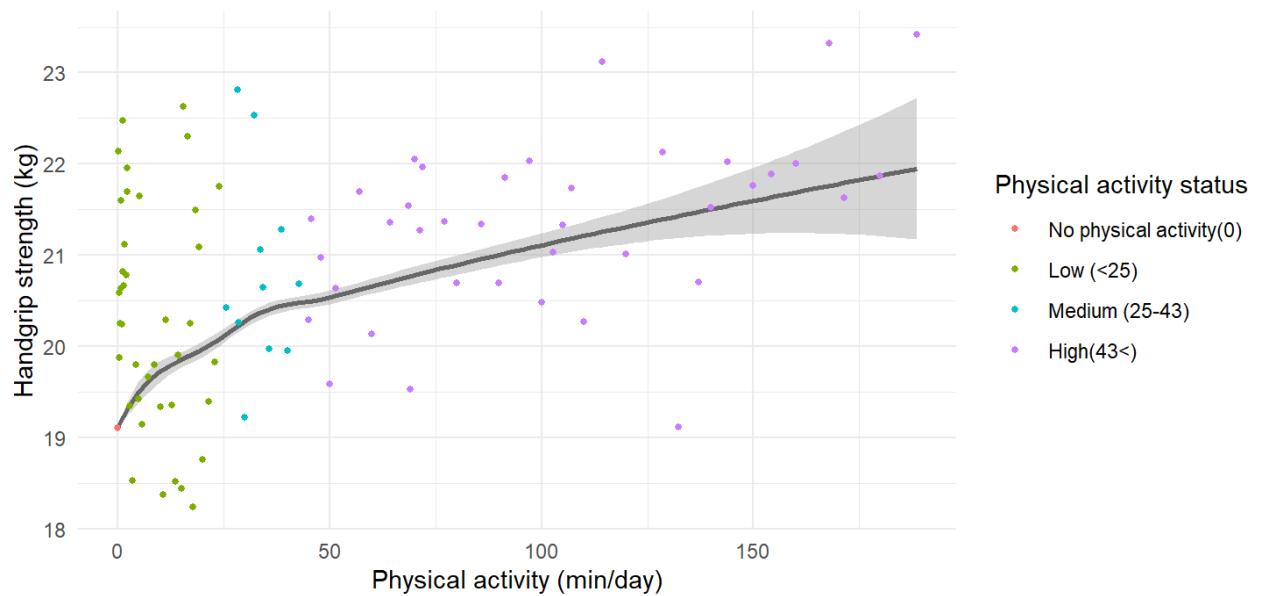
* The gray area indicates the 95% confidence interval.

S Figure 3. Handgrip strength and continuous physical activity changes by sex

(Men)



(Women)



* The gray area indicates the 95% confidence interval.

S Figure 4. Handgrip strength across categorized physical activity changes by sex