

Supplementary material

Supplementary table 1. Weighted Characteristics of Study Participants by Physical Job Demands^a at Baseline (Wave 1)

	Total (<i>n</i> = 2170)		Low PS (<i>n</i> = 696)		High PS (<i>n</i> = 1474)		Low LH (<i>n</i> = 964)		High LH (<i>n</i> = 1206)		Low BK (<i>n</i> = 786)		High BK (<i>n</i> = 1384)	
	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)	Mean (SD)	<i>n</i> (%)
Age	53.2 (6.6)		52.6 (5.8)		53.5 (6.9)		52.6 (5.9)		53.7 (7.1)		52.4 (5.7)		53.7 (7.1)	
Sex (male)		1349 (66.5)		497 (74.1)		852 (62.5)		638 (69.6)		711 (63.7)		557 (74.0)		792 (61.5)
Marital status (married)		1976 (91.0)		643 (92.1)		1333 (90.4)		885 (91.7)		1091 (90.4)		727 (92.0)		1249 (90.3)
Educational attainment														
Elementary school or below		671 (22.6)		95 (9.6)		576 (29.5)		171 (12.7)		500 (31.6)		118 (10.9)		553 (30.4)
Middle school		434 (18.8)		121 (14.2)		313 (21.2)		178 (15.9)		256 (21.5)		130 (14.5)		304 (21.7)
High school		781 (40.8)		285 (41.1)		496 (40.6)		388 (41.3)		393 (40.3)		329 (42.4)		452 (39.7)
College or above		284 (17.8)		195 (35.1)		89 (8.7)		227 (30.1)		57 (6.6)		209 (32.2)		75 (8.2)
Household income (below median)		1243 (51.8)		328 (41.6)		915 (57.2)		459 (42.8)		784 (60.0)		367 (42.5)		876 (57.9)
Residential area														
Metropolis		881 (45.4)		335 (51.6)		546 (42.1)		472 (51.2)		409 (40.0)		380 (51.6)		501 (41.2)

Small town	664	252	412	337	327	288	376
	(33.3)	(36.5)	(31.6)	(36.3)	(30.6)	(36.4)	(31.3)
Rural	625	109	516	155	470	118	507
	(21.3)	(11.9)	(26.3)	(12.5)	(29.4)	(12.0)	(27.5)
Body mass index (below 25 kg/m ²)	1662	522	1140	727	935	589	1073
	(75.9)	(73.3)	(77.2)	(74.9)	(76.8)	(74.1)	(77.1)
Smoking status							
Non-smoker	1331	414	917	602	729	472	859
	(57.9)	(59.0)	(57.3)	(60.8)	(55.3)	(58.2)	(57.7)
Ex-smoker	256	101	155	119	137	102	154
	(12.0)	(13.8)	(11.1)	(11.5)	(12.5)	(12.5)	(11.7)
Current smoker	583	181	402	243	340	212	371
	(30.1)	(27.2)	(31.6)	(27.7)	(32.2)	(29.3)	(30.6)
Risky drinker ^b (no)	1888	598	1290	847	1041	685	1203
	(86.1)	(85.1)	(86.6)	(87.1)	(85.1)	(86.4)	(85.8)
Physical activity ^c (sufficient)	781	367	414	471	310	415	366
	(38.7)	(53.8)	(30.7)	(49.9)	(28.4)	(52.5)	(29.5)
Hypertension ^d (no)	1778	560	1218	787	991	641	1137
	(83.2)	(81.8)	(84.0)	(83.1)	(83.3)	(83.1)	(83.3)
Diabetes ^d (no)	1995	629	1366	871	1124	716	1279
	(93.0)	(90.9)	(94.0)	(91.6)	(94.2)	(92.5)	(93.3)
Depressive symptoms ^e (no)	2085	683	1402	937	1148	769	1316
	(96.8)	(98.3)	(96.0)	(97.6)	(96.1)	(97.8)	(96.2)
Weekly work hours	49.9	47.1	51.4	48.3	51.4	48.6	50.8
	(16.9)	(15.3)	(17.5)	(15.3)	(18.2)	(14.8)	(18.2)
Employment status							
Permanent worker	675	318	357	444	231	381	294

	(35.6)	(51.7)	(27.1)	(51.7)	(21.0)	(53.3)	(23.8)
Temporary worker	127	35	92	56	71	38	89
	(5.9)	(4.3)	(6.8)	(5.1)	(6.7)	(4.4)	(7.0)
Day laborer	179	19	160	45	134	25	154
	(8.4)	(2.1)	(11.6)	(3.7)	(12.6)	(2.6)	(12.2)
Self-employed worker	979	281	698	369	610	309	670
	(42.9)	(36.9)	(46.1)	(35.5)	(49.6)	(36.5)	(47.1)
Unpaid family worker	210	43	167	50	160	33	177
	(7.2)	(5.0)	(8.4)	(4.0)	(10.1)	(3.2)	(9.9)
Occupation ^f							
Managers	85	59	26	77	8	69	16
	(4.9)	(9.4)	(2.5)	(9.2)	(1.0)	(9.2)	(2.0)
Professionals and related workers	103	75	28	84	19	79	24
	(5.4)	(11.7)	(2.1)	(9.6)	(1.6)	(10.5)	(2.0)
Clerks	170	119	51	134	36	123	47
	(9.5)	(17.9)	(5.1)	(15.5)	(4.0)	(16.8)	(4.7)
Service workers	235	52	183	111	124	64	171
	(10.2)	(6.4)	(12.3)	(9.9)	(10.5)	(7.7)	(11.9)
Sales workers	263	101	162	103	160	95	168
	(12.9)	(13.8)	(12.4)	(9.8)	(15.8)	(10.7)	(14.4)
Skilled agricultural, forestry, and fishery	342	14	328	21	321	9	333
	(10.2)	(1.3)	(14.9)	(1.5)	(18.2)	(0.7)	(16.6)
Craft and related trades workers	197	44	153	58	139	38	159
	(10.3)	(6.0)	(12.5)	(5.7)	(14.4)	(5.0)	(13.8)
Equipment, machine operating, and assembling	218	66	152	136	82	112	106
	(10.3)	(8.7)	(11.1)	(13.4)	(7.5)	(13.6)	(8.1)

Elementary workers	404 (18.2)	90 (10.6)	314 (22.2)	154 (13.7)	250 (22.2)	110 (11.9)	294 (22.3)
Unspecified	153 (8.1)	76 (14.2)	77 (4.9)	86 (11.7)	67 (4.8)	87 (13.9)	66 (4.2)

PS, physical strength; LH, lifting heavy objects; BK, bending, kneeling, or squatting; SD, standard deviation

All values, except the number of participants by category, were weighted estimates considering a complex sampling design.

^aFor simplicity, each physical job demand was dichotomized as low (never and sometimes) and high (often and always).

^bHigh-risk drinkers were defined as individuals who consumed alcohol twice or more per week, based on the Korea National Health and Nutrition Examination Survey criteria.

^cInsufficient physical activity was defined as less than 150 minutes per week based on the World Health Organization guidelines.

^dHypertension or diabetes cases were defined as those diagnosed with hypertension or diabetes by a physician.

^eDepressive symptoms were defined as a score of four or above on the 10-item Center for Epidemiologic Studies Depression Scale.

^fBased on the Korean Standard Classification of Occupations

Supplementary table 2. Weighted Prevalence of Cognitive Impairment Among Study Participants by Physical Job Demands During the Study Period

Physical job demands	Weighted prevalence of cognitive impairment (%)								Overall
	Wave 1 (2006)	Wave 2 (2008)	Wave 3 (2010)	Wave 4 (2012)	Wave 5 (2014)	Wave 6 (2016)	Wave 7 (2018)	Wave 8 (2020)	
Overall	6.9	7.2	8.2	6.6	9.5	8.2	12.5	12.2	8.6
Physical strength									
Never	3.1	4.7	10.4	5.8	6.5	10.9	4.1	5.5	6.4
Sometimes	2.3	7.0	5.7	4.5	6.6	4.2	11.1	12.7	6.4
Often	8.5	6.4	8.1	6.0	10.7	7.7	13.8	12.4	8.9
Always	10.4	10.1	11.1	11.5	13.2	14.8	14.4	13.6	11.9
Lifting heavy objects									
Never	3.0	3.1	6.3	3.2	5.6	3.9	3.1	1.8	3.8
Sometimes	3.9	6.7	4.8	5.2	6.4	4.0	11.4	12.7	6.4
Often	9.2	7.9	9.9	6.8	11.5	9.7	14.3	12.7	10.0
Always	10.7	10.1	12.4	11.1	14.8	16.9	15.3	16.4	12.8
Bending, kneeling, or squatting									
Never	2.9	0.8	6.0	5.2	4.5	5.4	2.1	2.1	3.6
Sometimes	2.4	6.2	5.2	5.0	6.0	2.9	8.1	13.2	5.7

Often	7.6	7.8	8.6	5.8	12.1	8.9	14.6	13.1	9.5
Always	13.2	11.1	14.2	12.6	12.6	17.7	20.1	12.6	13.9

Supplementary table 3. Weighted Distribution of Study Participants Across Levels of Each Physical Job Demand by Wave

Physical job demands	Distribution (weighted %) of respondents								
	Wave 1 (<i>n</i> = 2170)	Wave 2 (<i>n</i> = 1971)	Wave 3 (<i>n</i> = 1844)	Wave 4 (<i>n</i> = 1686)	Wave 5 (<i>n</i> = 1588)	Wave 6 (<i>n</i> = 1444)	Wave 7 (<i>n</i> = 1112)	Wave 8 (<i>n</i> = 1114)	Overall (<i>n</i> = 12929)
Physical strength									
Never	7.5	9.7	9.0	6.9	5.5	7.3	6.7	6.7	7.5
Sometimes	27.0	26.0	26.6	27.9	31.1	29.3	28.3	32.0	28.3
Often	39.5	42.4	45.4	45.9	48.8	45.5	47.2	45.7	44.7
Always	26.0	21.9	19.0	19.3	14.6	17.9	17.8	15.6	19.5
Lifting heavy objects									
Never	11.1	13.9	11.1	8.5	8.8	9.0	9.1	9.4	10.3
Sometimes	36.5	34.1	32.9	35.4	35.9	36.1	32.2	36.0	35.0
Often	31.2	34.3	39.9	39.9	43.4	39.9	42.9	40.1	38.4
Always	21.2	17.7	16.1	16.2	11.9	15.0	15.8	14.5	16.3
Bending, kneeling, or squatting									
Never	8.6	10.0	9.8	6.6	7.6	7.2	7.9	7.4	8.3
Sometimes	31.3	32.2	30.9	32.8	33.5	31.5	30.8	31.8	31.9
Often	36.9	38.9	43.2	43.8	46.4	45.0	45.6	42.7	42.4

Always	23.2	18.9	16.1	16.8	12.5	16.3	15.7	18.1	17.4
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Supplementary table 4. Results of Models^a Fitted with an Interaction Term Between Physical Strength and Potential Effect Modifiers

Subgroup	Physical job demands (physical strength)								p-value for interaction
	Never		Sometimes		Often		Always		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Overall	Ref		0.48	0.27–0.88	0.40	0.21–0.75	0.31	0.14–0.68	
Sex									0.388
Male	Ref		0.47	0.24–0.95	0.44	0.21–0.91	0.31	0.12–0.78	
Female	Ref		0.51	0.20–1.29	0.33	0.13–0.83	0.30	0.12–0.80	
Educational attainment									0.206
Elementary school or below	Ref		0.92	0.34–2.52	0.71	0.27–1.90	0.65	0.23–1.85	
Middle school	Ref		0.49	0.20–1.22	0.29	0.13–0.65	0.21	0.08–0.55	
High school	Ref		0.30	0.12–0.73	0.28	0.11–0.72	0.19	0.05–0.67	
College or above	Ref		0.89	0.13–5.96	1.46	0.22–9.77	0.74	0.07–8.34	
Household income									0.344
Below median	Ref		0.77	0.33–1.80	0.71	0.30–1.66	0.51	0.20–1.31	
Above median	Ref		0.40	0.20–0.80	0.31	0.15–0.63	0.26	0.11–0.62	
Body mass index									0.833
Below 25 kg/m ²	Ref		0.53	0.27–1.05	0.43	0.21–0.89	0.35	0.15–0.86	

Above 25 kg/m ²	Ref	0.36	0.13–1.04	0.30	0.11–0.81	0.21	0.07–0.63	
Smoking status								0.115
Non-smoker	Ref	0.59	0.28–1.23	0.41	0.20–0.86	0.34	0.15–0.78	
Ex-smoker	Ref	0.48	0.15–1.52	0.43	0.15–1.28	0.21	0.06–0.69	
Current smoker	Ref	0.27	0.10–0.75	0.33	0.10–1.10	0.34	0.08–1.54	
Physical activity ^b								0.942
Sufficient	Ref	0.47	0.19–1.14	0.42	0.18–0.98	0.36	0.13–0.96	
Insufficient	Ref	0.49	0.24–1.01	0.39	0.18–0.81	0.30	0.12–0.73	
Hypertension ^c								0.893
No	Ref	0.44	0.22–0.87	0.38	0.19–0.77	0.31	0.14–0.71	
Yes	Ref	0.58	0.19–1.73	0.44	0.15–1.27	0.32	0.10–1.06	
Diabetes ^c								0.353
No	Ref	0.51	0.27–0.94	0.39	0.20–0.74	0.32	0.14–0.72	
Yes	Ref	0.36	0.09–1.36	0.44	0.12–1.68	0.26	0.06–1.04	
Depressive symptoms ^d								0.061
No	Ref	0.41	0.22–0.77	0.35	0.18–0.67	0.30	0.14–0.64	
Yes	Ref	1.29	0.39–4.31	0.83	0.29–2.39	0.35	0.10–1.31	
Employment status								0.309

Permanent worker	Ref	1.14	0.47–2.74	0.65	0.27–1.57	0.58	0.22–1.57
Temporary worker	Ref	0.41	0.11–1.49	0.22	0.06–0.77	0.24	0.05–1.12
Day laborer	Ref	0.16	0.04–0.71	0.18	0.04–0.73	0.09	0.02–0.41
Self-employed worker	Ref	0.39	0.15–1.04	0.43	0.17–1.10	0.35	0.12–0.98
Unpaid family worker	Ref	0.33	0.03–4.24	0.34	0.03–4.25	0.32	0.02–4.30

OR, odds ratio; CI, confidence interval; Ref, reference.

^aAdjusted for sociodemographic, health-related, occupational characteristics, and other physical job demands.

^bInsufficient physical activity was defined as less than 150 min per week based on the World Health Organization guidelines.

^cHypertension or diabetes cases were defined as those diagnosed with hypertension or diabetes by a physician.

^dDepressive symptoms were defined as a score of four or above on the 10-item Center for Epidemiologic Studies Depression Scale.

Supplementary table 5. Results of Models^a Fitted with an Interaction Term Between Lifting Heavy Objects and Potential Effect Modifiers

Subgroup	Physical job demands (lifting heavy objects)								p-value for interaction
	Never		Sometimes		Often		Always		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Overall	Ref		2.01	1.17–3.46	2.29	1.30–4.06	2.67	1.36–5.26	
Sex									0.997
Male	Ref		1.95	1.01–3.76	2.20	1.09–4.44	2.55	1.14–5.75	
Female	Ref		2.13	0.97–4.68	2.45	1.12–5.36	2.88	1.20–6.92	
Educational attainment									0.128
Elementary school or below	Ref		1.63	0.72–3.69	2.15	0.95–4.86	2.65	1.06–6.62	
Middle school	Ref		5.50	1.68–18.00	4.40	1.32–14.66	6.48	1.72–24.47	
High school	Ref		1.34	0.62–2.94	1.37	0.60–3.11	1.25	0.46–3.40	
College or above	Ref		2.55	0.48–13.37	7.25	1.30–40.27	3.19	0.25–40.50	
Household income									0.162
Below median	Ref		2.83	1.29–6.21	3.84	1.74–8.48	3.69	1.55–8.81	
Above median	Ref		1.66	0.88–3.14	1.68	0.86–3.30	2.35	1.06–5.19	
Body mass index									0.379

Below 25 kg/m ²	Ref	2.50	1.31–4.80	2.71	1.39–5.29	3.03	1.41–6.52	
Above 25 kg/m ²	Ref	1.13	0.49–2.62	1.51	0.65–3.51	2.02	0.75–5.43	
Smoking status								0.460
Non-smoker	Ref	2.16	1.12–4.17	2.40	1.21–4.77	2.53	1.15–5.56	
Ex-smoker	Ref	1.72	0.59–4.96	1.77	0.59–5.27	1.75	0.53–5.86	
Current smoker	Ref	2.12	0.72–6.24	2.96	1.04–8.39	5.00	1.61–15.47	
Physical activity ^b								0.624
Sufficient	Ref	1.49	0.67–3.30	1.97	0.89–4.37	1.80	0.70–4.61	
Insufficient	Ref	2.41	1.21–4.79	2.62	1.32–5.21	3.20	1.45–7.07	
Hypertension ^c								0.459
No	Ref	2.67	1.39–5.13	3.21	1.63–6.35	3.63	1.66–7.93	
Yes	Ref	1.42	0.64–3.17	1.46	0.64–3.32	1.80	0.70–4.61	
Diabetes ^c								0.303
No	Ref	2.17	1.22–3.86	2.29	1.25–4.19	2.79	1.38–5.65	
Yes	Ref	1.34	0.52–3.45	2.40	0.88–6.55	2.16	0.66–7.06	
Depressive symptoms ^d								0.142
No	Ref	1.67	0.99–2.83	1.99	1.14–3.50	2.35	1.19–4.65	
Yes	Ref	9.60	2.10–	7.59	1.74–	8.24	1.75–	

			43.86		33.09		38.86	
Employment status								0.314
Permanent worker	Ref	3.54	1.53–8.16	2.89	1.20–6.98	4.49	1.62–12.47	
Temporary worker	Ref	1.26	0.35–4.60	1.27	0.37–4.39	2.71	0.61–12.13	
Day laborer	Ref	3.50	0.91–13.45	2.52	0.66–9.57	2.20	0.51–9.53	
Self-employed worker	Ref	1.51	0.69–3.30	2.26	1.00–5.14	2.42	0.93–6.26	
Unpaid family worker	Ref	1.16	0.22–6.05	1.85	0.32–10.74	1.80	0.29–11.02	

OR, odds ratio; CI, confidence interval; Ref, reference.

^aAdjusted for sociodemographic, health-related, occupational characteristics, and other physical job demands.

^bInsufficient physical activity was defined as less than 150 min per week based on the World Health Organization guidelines.

^cHypertension or diabetes cases were defined as those diagnosed with hypertension or diabetes by a physician.

^dDepressive symptoms were defined as a score of four or above on the 10-item Center for Epidemiologic Studies Depression Scale.

Supplementary table 6. Results of Models^a Fitted with an Interaction Term Between Bending, Kneeling, or Squatting and Potential Effect Modifiers

Subgroup	Physical job demands (bending, kneeling, or squatting)								p-value for interaction
	Never		Sometimes		Often		Always		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Overall	Ref		1.25	0.68–2.32	1.43	0.75–2.73	1.69	0.82–3.47	
Sex									0.784
Male	Ref		1.19	0.58–2.46	1.52	0.73–3.16	1.79	0.77–4.14	
Female	Ref		1.34	0.51–3.50	1.26	0.47–3.42	1.50	0.53–4.23	
Educational attainment									0.718
Elementary school or below	Ref		1.00	0.36–2.77	1.42	0.50–4.06	1.68	0.55–5.12	
Middle school	Ref		3.78	0.97–14.71	3.50	0.93–13.14	4.70	1.08–20.50	
High school	Ref		0.91	0.39–2.15	0.93	0.38–2.27	1.03	0.37–2.90	
College or above	Ref		1.60	0.31–8.19	2.53	0.48–13.38	1.42	0.13–16.12	
Household income									0.631
Below median	Ref		1.40	0.52–3.73	1.92	0.73–5.06	2.18	0.77–6.14	
Above median	Ref		1.21	0.59–2.46	1.26	0.60–2.62	1.52	0.67–3.48	

Body mass index							0.155
Below 25 kg/m ²	Ref	1.74	0.85–3.55	1.72	0.81–3.65	2.07	0.91–4.69
Above 25 kg/m ²	Ref	0.50	0.18–1.41	0.86	0.33–2.21	0.95	0.34–2.69
Smoking status							0.060
Non-smoker	Ref	1.50	0.66–3.42	1.51	0.64–3.55	1.56	0.64–3.79
Ex-smoker	Ref	0.94	0.31–2.87	1.05	0.34–3.19	0.93	0.27–3.12
Current smoker	Ref	1.14	0.37–3.55	1.98	0.67–5.87	4.23	1.26–14.18
Physical activity ^b							0.824
Sufficient	Ref	1.18	0.48–2.88	1.22	0.50–2.95	1.76	0.65–4.77
Insufficient	Ref	1.30	0.60–2.84	1.53	0.70–3.35	1.72	0.74–4.02
Hypertension ^c							0.798
No	Ref	1.53	0.73–3.23	1.65	0.76–3.59	1.98	0.85–4.65
Yes	Ref	0.88	0.33–2.35	1.12	0.42–3.00	1.27	0.45–3.59
Diabetes ^c							0.148
No	Ref	1.18	0.61–2.28	1.25	0.62–2.52	1.56	0.73–3.36
Yes	Ref	2.05	0.66–6.36	3.63	1.29–10.22	2.86	0.76–10.71
Depressive symptoms ^d							0.992

No	Ref	1.23	0.65–2.34	1.40	0.72–2.73	1.65	0.79–3.43
Yes	Ref	1.42	0.33–6.11	1.71	0.45–6.44	1.99	0.45–8.79
Employment status							0.459
Permanent worker	Ref	1.30	0.52–3.26	0.93	0.36–2.41	1.69	0.59–4.84
Temporary worker	Ref	0.83	0.19–3.67	1.31	0.32–5.37	2.38	0.48–11.77
Day laborer	Ref	1.32	0.29–5.98	1.66	0.40–6.96	1.62	0.34–7.87
Self-employed worker	Ref	1.16	0.43–3.08	1.57	0.57–4.32	1.73	0.59–5.06
Unpaid family worker	Ref	2.43	0.48–12.24	3.43	0.82–14.45	2.58	0.59–11.37

OR, odds ratio; CI, confidence interval; Ref, reference.

- ^aAdjusted for sociodemographic, health-related, occupational characteristics, and other physical job demands.
- ^bInsufficient physical activity was defined as less than 150 min per week based on the World Health Organization guidelines.
- ^cHypertension or diabetes cases were defined as those diagnosed with hypertension or diabetes by a physician.
- ^dDepressive symptoms were defined as a score of four or above on the 10-item Center for Epidemiologic Studies Depression Scale.

Supplementary table 7. Longitudinal Associations Between Physical Job Demands and Cognitive Impairment: Incorporating Time-Lagged

Variables and Changes

Physical job demands	Total						Male						Female					
	Total		Low EDU ^a		High EDU		Total		Low EDU		High EDU		Total		Low EDU		High EDU	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Physical strength																		
Never	Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref	
Sometimes	0.67	0.37–1.21	0.55	0.23–1.28	0.81	0.35–1.85	0.55	0.27–1.10	0.35	0.13–0.96	0.75	0.29–1.92	1.10	0.33–3.59	1.29	0.20–8.53	0.55	0.13–2.35
Often	0.57	0.27–1.21	0.34	0.13–0.92	1.04	0.33–3.26	0.48	0.20–1.18	0.21	0.06–0.71	1.02	0.30–3.48	0.90	0.22–3.75	0.95	0.13–6.75	0.55	0.05–6.01
Always	0.39	0.15–1.06	0.22	0.07–0.69	0.99	0.19–5.08	0.35	0.10–1.23	0.11	0.02–0.52	1.28	0.21–7.88	0.64	0.13–3.14	0.82	0.11–5.96	0.18	0.01–2.99
The change in physical strength	0.73	0.56–0.95	0.69	0.53–0.91	0.80	0.49–1.32	0.69	0.49–0.97	0.58	0.40–0.83	0.83	0.47–1.46	0.80	0.56–1.15	0.86	0.58–1.27	0.64	0.25–1.64
Lifting heavy objects																		
Never	Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref	
Sometimes	2.28	1.27–4.11	1.92	0.82–4.51	2.26	1.02–5.00	1.70	0.86–3.37	1.61	0.55–4.69	1.59	0.68–3.76	4.58	1.28–16.43	3.28	0.63–16.99	11.30	2.65–48.17
Often	3.00	1.46–6.14	2.76	1.01–7.56	2.52	0.91–6.93	2.43	1.00–5.90	2.60	0.67–10.14	1.87	0.62–5.67	4.86	1.20–19.68	3.98	0.68–23.49	9.79	1.33–72.03
Always	4.32	1.76–10.58	5.37	1.64–17.56	1.95	0.48–7.88	2.92	0.91–9.37	4.73	0.84–26.58	1.29	0.28–6.03	9.25	1.89–45.13	8.81	1.22–63.52	11.58	0.93–143.67
The change in	1.20	0.96–	1.35	1.01–	0.99	0.71–	1.18	0.87–	1.38	0.87–	0.99	0.68–	1.19	0.87–	1.30	0.91–	0.92	0.46–

lifting heavy objects		1.49		1.80		1.37		1.58		2.16		1.42		1.63		1.86		1.86
Bending, kneeling, or squatting																		
Never	Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref		Ref	
Sometimes	0.70	0.35–1.40	1.24	0.46–3.36	0.52	0.21–1.30	0.80	0.36–1.76	0.92	0.28–3.05	0.71	0.26–1.93	0.66	0.13–3.42	5.54	0.61–50.43	0.18	0.02–1.41
Often	0.82	0.38–1.75	1.42	0.49–4.11	0.59	0.21–1.68	1.04	0.42–2.62	1.53	0.39–6.03	0.72	0.22–2.33	0.60	0.11–3.25	3.74	0.37–37.61	0.27	0.02–3.28
Always	0.90	0.36–2.27	1.84	0.56–6.06	0.47	0.10–2.13	1.20	0.38–3.80	2.09	0.43–10.19	0.57	0.09–3.43	0.56	0.09–3.56	3.78	0.33–43.33	0.19	0.01–4.77
The change in bending, kneeling, or squatting	1.09	0.87–1.37	1.10	0.84–1.45	1.08	0.75–1.57	1.25	0.94–1.66	1.34	0.91–1.99	1.14	0.76–1.71	0.83	0.58–1.20	0.81	0.56–1.16	0.85	0.31–2.36

EDU, educational attainment; OR, odds ratio; CI, confidence interval; Ref, reference

Adjusted for sociodemographic, health-related, occupational characteristics, and other physical job demands.

^aEducational attainment was dichotomized as low EDU (middle school or below) and high EDU (high school or above).