Supplementary Table S1. Odds ratios for daily step counts and the prevalence rates of frailty defined by the FP model, calculated using age and sex stratified multivariate logistic regression*

	Quartile of daily Step counts									1000 steps/day increment			
	Q1		Q2		Q3		Q4		*p* for trend †	< 4000 steps/day		≥ 4000 steps/day	
Men, n	465		465		465		465						
Step [steps/day]	1754	(459)	3192	(401)	4744	(534)	7651	(1672)					
Case [n (%)]	74	(15.9)	61	(13.1)	49	(10.5)	31	(6.7)					
Model 1 ‡	1.00	(Ref)	0.81	(0.56 to 1.19)	0.65	(0.43 to 0.98)	0.43	(0.27 to 0.68)	**<0.001**	0.67	(0.44 to 0.91)	0.86	(0.71 to 1.01)
Model 2 §	1.00	(Ref)	0.83	(0.56 to 1.21)	0.67	(0.44 to 1.02)	0.43	(0.26 to 0.69)	**<0.001**	0.69	(0.45 to 0.93)	0.86	(0.71 to 1.01)
Women, n	439		439		439		439						
Step [steps/day]	1772	(365)	2822	(287)	4035	(415)	6620	(1604)					
Case [n (%)]	70	(16.04)	54	(12.3)	42	(9.6)	28	(6.4)					
Model 1 ‡	1.00	(Ref)	0.77	(0.52 to 1.13)	0.59	(0.38 to 0.89)	0.36	(0.23 to 0.59)	**<0.001**	0.79	(0.59 to 0.98)	0.83	(0.60 to 1.05)
Model 2 §	1.00	(Ref)	0.75	(0.51 to 1.12)	0.58	(0.38 to 0.90)	0.36	(0.22 to 0.596)	**<0.001**	0.80	(0.61 to 0.99)	0.81	(0.58 to 1.05)
<75 years, n	629		629		629		629						
Step [steps/day]	2013	(479)	3366	(3731)	4797	(492)	7620	(1647)					
Case [n (%)]	93	(14.8)	59	(9.4)	55	(8.7)	41	(6.5)					
Model 1 ‡	1.00	(Ref)	0.59	(0.41 to 0.83)	0.53	(0.37 to 0.76)	0.38	(0.26 to 0.57)	**<0.001**	0.731	(0.51 to 0.95)	0.849	(0.72 to 0.98)
Model 2 §	1.00	(Ref)	0.60	(0.43 to 0.86)	0.55	(0.38 to 0.79)	0.40	(0.26 to 0.59)	**<0.001**	0.75	(0.53 to 0.98)	0.85	(0.72 to 0.99)
≥75 years, n	275		275		275		275						
Step [steps/day]	1440	(300)	2323	(255)	3373	(392)	5824	(1551)					
Case [n (%)]	52	(18.9)	55	(20.0)	32	(11.6)	22	(8.0)					
Model 1 ‡	1.00	(Ref)	1.06	(0.69 to 1.63)	0.54	(0.33 to 0.88)	0.35	(0.20 to 0.61)	**<0.001**	0.72	(0.47 to 0.97)	0.84	(0.50 to 1.17)
Model 2 §	1.00	(Ref)	1.02	(0.65 to 1.59)	0.52	(0.32 to 0.86)	0.34	(0.19 to 0.60)	**<0.001**	0.71	(0.45 to 0.96)	0.83	(0.45 to 1.21)

Abbreviations: BMI, body mass index; FP, Fried phenotype; Ref, reference.

* Daily step counts are shown as means and standard deviations. Q1 through Q4 include daily step count of <2504, 2505-3898, 3901-5726, and ≥5731 steps/day in men, <2333, 2333-3357, 3358-4801, and ≥4804 steps/day in women, <2740, 2743-4017, 4018-5720, and ≥5721 steps/day in <75 years participants, and <1888, 1889-2784, 2785-4123, and ≥4129 steps/day in ≥75 years participants. The number of frailty people is shown as number of cases (%). Statistical values for the association of daily step count and prevalence of frailty is shown as the odds ratio and 95% confidence interval. The *p*-values in bold are statistically significant ($p<0.05$).

† *p*-values of linear trends were calculated by the likelihood ratio test using the exposure variable of daily step count as a continuous variable.

‡ Model 1: Adjusted for age, sex (only age-stratified model), region, and season in which step count was assessed.

§ Model 2: In addition to the factors adjusted in Model 1, we adjusted for BMI, smoking status, alcohol consumption status, educational attainment, medication use, family structure, economic status, denture use, and history of hypertension, stroke, heart disease, diabetes, and hyperlipidemia.

Supplementary Table S2. Odds ratios for daily step counts and the prevalence rates of frailty defined by the KCL, calculated using age and sex stratified multivariate logistic regression [*]

	Quartile of daily Step counts								*p* for trend [†]	1000 steps/day increment			
	Q1		Q2		Q3		Q4			< 4000 steps/day		≥ 4000 steps/day	
Men, n	465		465		465		465						
Step [steps/day]	1754	(459)	3192	(401)	4744	(534)	7651	(1672)					
Case [n (%)]	163	(35.1)	129	(27.7)	115	(24.7)	87	(18.7)					
Model 1 [‡]	1.00	(Ref)	0.81	(0.61 to 1.09)	0.78	(0.57 to 1.05)	0.60	(0.43 to 0.83)	**<0.001**	0.82	(0.66 to 0.98)	0.91	(0.83 to 0.99)
Model 2 [§]	1.00	(Ref)	0.82	(0.61 to 1.11)	0.79	(0.57 to 1.08)	0.60	(0.43 to 0.84)	**<0.001**	0.87	(0.74 to 0.99)	0.91	(0.82 to 0.99)
Women, n	439		439		439		439						
Step [steps/day]	1772	(365)	2822	(287)	4035	(415)	6620	(1604)					
Case [n (%)]	175	(39.9)	124	(28.3)	103	(23.5)	72	(16.4)					
Model 1 [‡]	1.00	(Ref)	0.67	(0.50 to 0.90)	0.57	(0.42 to 0.77)	0.37	(0.27 to 0.52)	**<0.001**	0.76	(0.58 to 0.93)	0.83	(0.68 to 0.97)
Model 2 [§]	1.00	(Ref)	0.72	(0.53 to 0.97)	0.60	(0.44 to 0.83)	0.40	(0.28 to 0.56)	**<0.001**	0.79	(0.60 to 0.96)	0.79	(0.63 to 0.94)
<75 years, n	629		629		629		629						
Step [steps/day]	2013	(479)	3366	(3731)	4797	(492)	7620	(1647)					
Case [n (%)]	170	(27.0)	137	(21.8)	123	(19.6)	101	(16.1)					
Model 1 [‡]	1.00	(Ref)	0.76	(0.58 to 0.98)	0.65	(0.50 to 0.86)	0.52	(0.39 to 0.69)	**<0.001**	0.79	(0.62 to 0.95)	0.89	(0.81 to 0.98)
Model 2 [§]	1.00	(Ref)	0.79	(0.60 to 1.04)	0.71	(0.53 to 0.94)	0.55	(0.41 to 0.74)	**<0.001**	0.83	(0.67 to 0.99)	0.89	(0.80 to 0.98)
≥75 years, n	275		275		275		275						
Step [steps/day]	1440	(300)	2323	(255)	3373	(392)	5824	(1551)					
Case [n (%)]	140	(50.9)	124	(45.1)	100	(36.4)	73	(26.6)					
Model 1 [‡]	1.00	(Ref)	0.80	(0.57 to 1.13)	0.58	(0.41 to 0.82)	0.37	(0.25 to 0.53)	**<0.001**	0.77	(0.59 to 0.95)	0.85	(0.73 to 0.97)
Model 2 [§]	1.00	(Ref)	0.89	(0.62 to 1.27)	0.64	(0.44 to 0.92)	0.39	(0.27 to 0.58)	**<0.001**	0.83	(0.67 to 0.99)	0.84	(0.71 to 0.98)

Abbreviations: BMI, body mass index; KCL, Kihon Checklist; Ref, reference.

[*] Daily step counts are shown as means and standard deviations. Q1 through Q4 include daily step count of <2504, 2505-3898, 3901-5726, and ≥5731 steps/day in men, <2333, 2333-3357, 3358-4801, and ≥4804 steps/day in women, <2740, 2743-4017, 4018-5720, and ≥5721 steps/day in <75 years participants, and <1888, 1889-2784, 2785-4123, and ≥4129 steps/day in ≥75 years participants. The number of frailty people is shown as number of cases (%). Statistical values for the association of daily step count and prevalence of frailty is shown as the odds ratio and 95% confidence interval. The *p*-values in bold are statistically significant ($p<0.05$).

[†] *p*-values of linear trends were calculated by the likelihood ratio test using the exposure variable of daily step count as a continuous variable.

[‡] Model 1: Adjusted for age, sex (only age-stratified model), region, and season in which step count was assessed.

[§] Model 2: In addition to the factors adjusted in Model 1, we adjusted for BMI, smoking status, alcohol consumption status, educational attainment, medication use, family structure, economic status, denture use, and history of hypertension, stroke, heart disease, diabetes, and hyperlipidemia.

Supplementary Table S3. Odds ratios for daily step counts and the prevalence rates of KCL subdomains, calculated using age and sex stratified multivariate logistic regression [*]

	Quartile of daily step counts								*p* for trend [†]	1000 steps/day increment			
	Q1 (*n* = 904)		Q2 (*n* = 904)		Q3 (*n* = 904)		Q4 (*n* = 904)			< 4000 steps/day		≥ 4000 steps/day	
Step [steps/day]	1759	(441)	2988	(345)	4377	(476)	7200	(1662)					
IADL disability													
Case [n (%)]	69	(7.6)	34	(3.8)	30	(3.3)	19	(2.1)					
Model 1 [‡]	1.00	(Ref)	0.53	(0.34 to 0.81)	0.49	(0.31 to 0.77)	0.32	(0.19 to 0.55)	**<0.001**	0.57	(0.32 to 0.81)	0.86	(0.65 to 1.07)
Model 2 [§]	1.00	(Ref)	0.54	(0.35 to 0.83)	0.50	(0.31 to 0.80)	0.33	(0.19 to 0.57)	**<0.001**	0.59	(0.34 to 0.84)	0.86	(0.64 to 1.08)
Physical													
Case [n (%)]	219	(24.2)	169	(18.7)	111	(12.3)	75	(8.3)					
Model 1 [‡]	1.00	(Ref)	0.81	(0.64 to 1.02)	0.54	(0.41 to 0.70)	0.40	(0.30 to 0.54)	**<0.001**	0.79	(0.65 to 0.94)	0.81	(0.69 to 0.93)
Model 2 [§]	1.00	(Ref)	0.83	(0.65 to 1.06)	0.58	(0.44 to 0.76)	0.45	(0.34 to 0.62)	**<0.001**	0.82	(0.67 to 0.96)	0.83	(0.71 to 0.95)
Nutrition													
Case [n (%)]	17	(1.9)	9	(1.0)	15	(1.7)	9	(1.0)					
Model 1 [‡]	1.00	(Ref)	0.57	(0.25 to 1.31)	1.01	(0.48 to 2.12)	0.67	(0.28 to 1.61)	0.788	0.99	(0.54 to 1.45)	1.02	(0.75 to 1.29)
Model 2 [§]	1.00	(Ref)	0.62	(0.23 to 1.69)	1.55	(0.62 to 3.83)	0.55	(0.19 to 1.57)	0.387	1.22	(0.67 to 1.78)	0.80	(0.39 to 1.15)
Oral													
Case [n (%)]	233	(25.8)	194	(21.5)	186	(20.6)	154	(17.0)					
Model 1 [‡]	1.00	(Ref)	0.87	(0.69 to 1.08)	0.86	(0.68 to 1.08)	0.71	(0.56 to 0.91)	**<0.001**	0.95	(0.82 to 1.08)	0.92	(0.84 to 0.99)
Model 2 [§]	1.00	(Ref)	0.88	(0.70 to 1.11)	0.88	(0.70 to 1.11)	0.75	(0.58 to 0.96)	**<0.001**	0.97	(0.84 to 1.11)	0.92	(0.84 to 0.99)
Social													
Case [n (%)]	67	(7.4)	40	(4.4)	41	(4.5)	29	(3.2)					
Model 1 [‡]	1.00	(Ref)	0.61	(0.40 to 0.92)	0.65	(0.43 to 0.99)	0.48	(0.30 to 0.78)	**0.006**	0.77	(0.56 to 0.98)	0.99	(0.84 to 1.15)
Model 2 [§]	1.00	(Ref)	0.62	(0.41 to 0.95)	0.68	(0.44 to 1.04)	0.51	(0.31 to 0.83)	**0.013**	0.80	(0.61 to 0.99)	0.99	(0.83 to 1.15)
Cognitive													
Case [n (%)]	322	(35.6)	287	(31.8)	312	(34.5)	286	(31.6)					
Model 1 [‡]	1.00	(Ref)	0.87	(0.71 to 1.06)	0.99	(0.81 to 1.21)	0.85	(0.69 to 1.05)	**0.018**	0.96	(0.84 to 1.07)	0.92	(0.86 to 0.98)
Model 2 [§]	1.00	(Ref)	0.91	(0.74 to 1.11)	1.05	(0.85 to 1.29)	0.92	(0.74 to 1.14)	0.103	0.99	(0.87 to 1.11)	0.93	(0.86 to 0.99)
Depression													
Case [n (%)]	316	(35.0)	233	(25.8)	238	(26.3)	166	(18.4)					
Model 1 [‡]	1.00	(Ref)	0.69	(0.56 to 0.85)	0.75	(0.61 to 0.92)	0.49	(0.39 to 0.61)	**<0.001**	0.80	(0.68 to 0.92)	0.86	(0.79 to 0.94)
Model 2 [§]	1.00	(Ref)	0.70	(0.57 to 0.87)	0.78	(0.63 to 0.96)	0.51	(0.40 to 0.64)	**<0.001**	0.82	(0.70 to 0.95)	0.85	(0.78 to 0.93)

Abbreviations: BMI, body mass index; IADL, Instrumental Activities of Daily Living; KCL, Kihon Checklist; Ref, reference.

[*] Daily step counts are shown as means and standard deviations. Q1 through Q4 include daily step count of <2406, 2406-3619, 3620-5304, and ≥5310 steps/day in total participants. The number of applicable people of subdomain is shown as number of cases (%). Statistical values for the association of daily step count and prevalence of subdomains is shown as the odds ratio and 95% confidence interval. The *p*-values in bold are statistically significant ($p<0.05$).

[†] *p*-values of linear trends were calculated by the likelihood ratio test using the exposure variable of daily step count as a continuous variable.

[‡] Model 1: Adjusted for age, sex, region, and season in which step count was assessed.

[§] Model 2: In addition to the factors adjusted in Model 1, we adjusted for BMI, smoking status, alcohol consumption status, educational attainment, medication use, family structure, economic status, denture use, and history of hypertension, stroke, heart disease, diabetes, and hyperlipidemia.