

List of supplementary materials

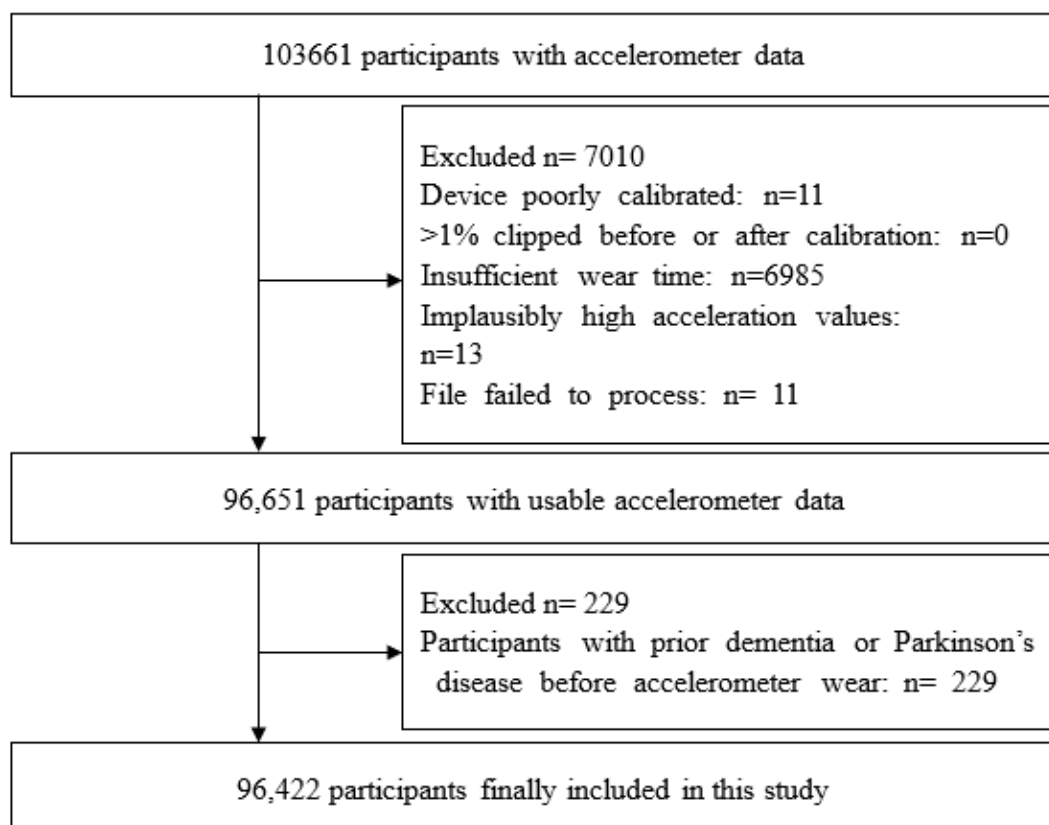
Supplementary Figure 1. Flow chart of the participants in the current analysis.

Supplementary Figure 2. The dose-response associations of physical activity and sedentary behaviors with the risk of incident Parkinson's disease.

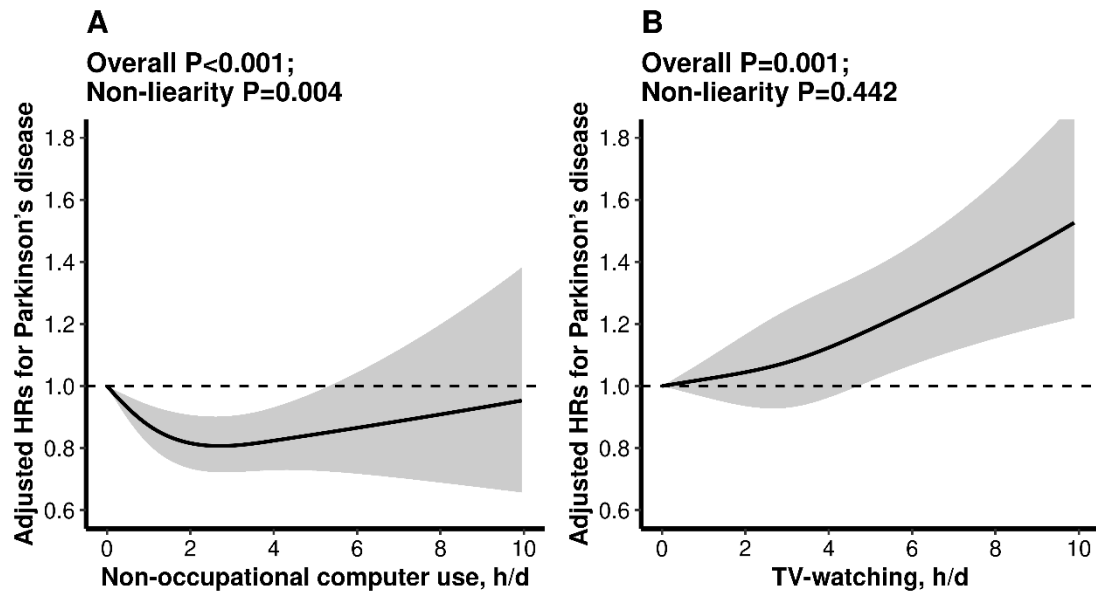
Supplementary Table 1. Sensitivity analysis for the independent associations of physical activity and sedentary time with the risk of incident Parkinson's disease.

Supplementary Table 2. The independent associations of physical activity and sedentary time with the risk of incident Parkinson's disease.

Supplementary Table 3. HR (95%CI) for incident Parkinson's disease associated with physical activity and sedentary time in various subgroups.



Supplementary Figure 1. Flow chart of the participants in the current analysis.



Supplementary Figure 2. The dose-response associations of sedentary behaviors with the risk of incident Parkinson's disease ¹.

¹Adjusted for age, sex, ethnicities, recruitment center, Townsend Deprivation Index, educational attainment, household income, employment, smoking status, alcohol consumption, and body mass index, and pre-existing chronic conditions (hypertension, diabetes and cardiovascular disease).

Supplementary Table 1. Sensitivity analysis for the independent associations of physical activity and sedentary time with the risk of incident Parkinson's disease.

	Quartiles of Exposures				<i>P</i> for trend
	Q1	Q2	Q3	Q4	
Sensitivity analysis 1: Excluding participants within 2 years of follow-up					
Light physical activity					
Events	153	49	33	25(1.6)	
Adjusted HR (95% CI) ¹	ref	0.33(0.23, 0.45)	0.22(0.15, 0.33)	0.19(0.12, 0.29)	<0.001
Moderate-to-vigorous physical activity					
Events	95	62	59	44	
Adjusted HR (95% CI) ¹	ref	0.60(0.43, 0.83)	0.55(0.39, 0.77)	0.37(0.26, 0.55)	<0.001
Sedentary time					
Events	36	43	64	117	
Adjusted HR (95% CI) ¹	ref	1.08(0.69, 1.68)	1.62(1.07, 2.45)	2.99(2.03, 4.41)	<0.001
Sensitivity analysis 2: Using Fine-Gray competing risk model.					
Light physical activity					
Events	193	55	35	30	
Death	1094	763	625	545	
Adjusted HR (95% CI) ¹	ref	0.29(0.22,0.4)	0.19(0.13,0.28)	0.18(0.12,0.27)	<0.001
Moderate-to-vigorous physical activity					
Events	119	72	66	56	
Death	1138	738	638	513	
Adjusted HR (95% CI) ¹	ref	0.57(0.43,0.77)	0.51(0.37,0.69)	0.39(0.28,0.55)	<0.001
Sedentary time					
Events	46	45	74	148	
Death	580	653	734	1060	
Adjusted HR (95% CI) ¹	ref	0.88(0.58,1.33)	1.45(0.99,2.11)	2.86(1.99,4.1)	<0.001

¹Adjusted for age, sex, ethnicities, recruitment center, Townsend Deprivation Index, educational attainment, household income, employment, smoking status, alcohol consumption, and body mass index, pre-existing chronic conditions (hypertension, diabetes and cardiovascular disease), and the season of accelerometer wear.

Supplementary Table 2. The independent associations of physical activity and sedentary time with the risk of incident Parkinson's disease.

Exposure	Total	Events (rate ¹)	Crude Model		Adjusted Model ²	
			HR (95%CI)	P value	HR (95%CI)	P value
Light physical activity						
Low (Q1)	24097	193(12.2)	4.89(3.89, 6.14)	<0.001	4.48(3.52, 5.69)	<0.001
High (Q2-Q4)	72325	120(2.5)	ref		ref	
Moderate-to-vigorous physical activity						
Low (Q1)	24089	119(7.6)	1.89(1.51, 2.38)	<0.001	2.07(1.62, 2.65)	<0.001
High (Q2-Q4)	72333	194(4.0)	ref		ref	
Sedentary time						
Low (Q1-Q2)	48195	91(2.8)	ref		ref	
High (Q3-Q4)	48227	222(7.0)	2.46(1.93, 3.14)	<0.001	2.28(1.77, 2.92)	<0.001

¹Incidence rates per 10000 person-years.

²Adjusted for age, sex, ethnicities, recruitment center, Townsend Deprivation Index, educational attainment, household income, employment, smoking status, alcohol consumption, and body mass index, pre-existing chronic conditions (hypertension, diabetes and cardiovascular disease), and the season of accelerometer wear.

Supplementary Table 3. HR (95%CI) for incident Parkinson's disease associated with physical activity and sedentary time in various subgroups¹.

		Quartiles of Exposures				P for
		Q1	Q2	Q3	Q4	interaction
<i>Light physical activity</i>						
Age, years						0.373
<60	ref		0.35(0.18,0.70)	0.34(0.17,0.69)	0.22(0.10,0.50)	
≥60	ref		0.28(0.20,0.39)	0.16(0.10,0.24)	0.16(0.10,0.26)	
Sex						0.304
Female	ref		0.22(0.13,0.38)	0.14(0.08,0.25)	0.13(0.07,0.23)	
Male	ref		0.33(0.23,0.47)	0.22(0.14,0.35)	0.23(0.14,0.40)	
Body mass index, kg/m²						0.730
<25	ref		0.35(0.22,0.57)	0.18(0.10,0.32)	0.20(0.11,0.35)	
≥25	ref		0.26(0.17,0.39)	0.21(0.13,0.33)	0.18(0.10,0.31)	
Smoking status						0.934
Never	ref		0.29(0.20,0.44)	0.19(0.12,0.31)	0.16(0.10,0.27)	
Ever	ref		0.29(0.18,0.46)	0.19(0.11,0.33)	0.21(0.11,0.38)	
Alcohol consumption, times/week						0.903
<1	ref		0.25(0.13,0.46)	0.18(0.09,0.37)	0.19(0.10,0.38)	
≥1	ref		0.31(0.22,0.43)	0.19(0.12,0.29)	0.17(0.11,0.28)	
Townsend Deprivation Index						0.673
< Median	ref		0.26(0.17,0.39)	0.17(0.11,0.28)	0.15(0.09,0.26)	
≥ Median	ref		0.34(0.22,0.53)	0.21(0.12,0.36)	0.22(0.12,0.38)	
<i>Moderate-to-vigorous physical activity</i>						
Age, years						0.868
<60	ref		0.49(0.25,0.97)	0.38(0.19,0.76)	0.28(0.14,0.58)	
≥60	ref		0.55(0.40,0.77)	0.50(0.35,0.70)	0.38(0.26,0.55)	
Sex						0.258
Female	ref		0.48(0.29,0.79)	0.30(0.16,0.56)	0.39(0.20,0.75)	
Male	ref		0.62(0.43,0.90)	0.60(0.41,0.86)	0.40(0.27,0.59)	
Body mass index, kg/m²						0.365
<25	ref		0.49(0.30,0.82)	0.35(0.20,0.59)	0.33(0.20,0.55)	
≥25	ref		0.62(0.43,0.89)	0.62(0.43,0.91)	0.44(0.28,0.68)	
Smoking status						0.828
Never	ref		0.58(0.39,0.85)	0.48(0.32,0.73)	0.35(0.22,0.54)	
Ever	ref		0.55(0.35,0.87)	0.53(0.33,0.84)	0.45(0.28,0.74)	
Alcohol consumption, times/week						0.188
<1	ref		0.31(0.17,0.59)	0.43(0.24,0.78)	0.35(0.18,0.68)	
≥1	ref		0.68(0.48,0.95)	0.53(0.37,0.76)	0.40(0.27,0.59)	

Townsend Deprivation					0.936
Index					
< Median	ref	0.54(0.36,0.81)	0.46(0.30,0.70)	0.39(0.25,0.60)	
≥ Median	ref	0.58(0.38,0.90)	0.53(0.34,0.83)	0.37(0.22,0.61)	
Sedentary time					
Age, years					0.790
<60	ref	0.87(0.36,2.11)	1.08(0.48,2.46)	2.39(1.19,4.82)	
≥60	ref	0.93(0.58,1.48)	1.63(1.07,2.47)	3.22(2.18,4.74)	
Sex					0.178
Female	ref	0.94(0.47,1.89)	1.80(0.97,3.36)	4.56(2.58,8.06)	
Male	ref	0.82(0.49,1.37)	1.24(0.78,1.97)	2.28(1.51,3.46)	
Body mass index, kg/m^2					0.099
<25	ref	0.83(0.42,1.63)	1.62(0.90,2.94)	4.22(2.47,7.19)	
≥25	ref	0.83(0.49,1.40)	1.22(0.76,1.96)	2.12(1.38,3.27)	
Smoking status					0.786
Never	ref	0.83(0.49,1.40)	1.28(0.79,2.08)	2.86(1.85,4.41)	
Ever	ref	0.97(0.50,1.87)	1.72(0.96,3.07)	2.92(1.70,5.03)	
Alcohol consumption, times/week					0.189
<1	ref	1.56(0.73,3.30)	1.45(0.67,3.14)	3.35(1.70,6.60)	
≥1	ref	0.68(0.41,1.13)	1.44(0.94,2.19)	2.76(1.87,4.08)	
Townsend Deprivation					0.309
Index					
< Median	ref	0.62(0.35,1.10)	1.34(0.83,2.16)	2.63(1.70,4.07)	
≥ Median	ref	1.33(0.72,2.46)	1.64(0.91,2.96)	3.35(1.96,5.74)	

¹Adjusted, if not stratified, age, sex, ethnicities, recruitment center, Townsend Deprivation Index, educational attainment, household income, employment, smoking status, alcohol consumption, and body mass index, pre-existing chronic conditions (hypertension, diabetes and cardiovascular disease), and the season of accelerometer wear.