Post-COVID fatigue is associated with reduced cortical thickness after hospitalization

Running title: COVID-19 and gray matter reduction

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Table S1. Group differences in cortical thickness between patients after COVID-19 and healthy control participants.

Region	Cohen's d (95% CI)	p	p (FDR)
rh_G_oc_temp_med_Parahip	0.84 (0.46, 1.23)	0.000	0.003
lh_G_oc_temp_med_Parahip	0.75 (0.37, 1.13)	0.000	0.011
lh_G_temp_sup_Plan_polar	0.68 (0.29, 1.06)	0.000	0.023
lh_Pole_temporal	0.64 (0.26, 1.02)	0.001	0.024
rh_Pole_temporal	0.64 (0.26, 1.02)	0.001	0.024
rh_G_front_sup	0.64 (0.26, 1.02)	0.001	0.024
rh_G_cingul_Post_dorsal	0.60 (0.22, 0.98)	0.002	0.038
rh_S_pericallosal	0.59 (0.21, 0.97)	0.002	0.042
rh_G_temp_sup_Plan_polar	0.57 (0.19, 0.95)	0.003	0.049
lh_G_insular_short	0.54 (0.16, 0.92)	0.005	0.070
rh_G_and_S_cingul_Ant	0.52 (0.14, 0.90)	0.007	0.090
lh_S_orbital_lateral	0.47 (0.09, 0.84)	0.014	0.124
lh_G_front_middle	0.47 (0.09, 0.85)	0.014	0.124
lh_G_temporal_middle	0.47 (0.10, 0.85)	0.013	0.124
lh_S_pericallosal	0.47 (0.10, 0.85)	0.013	0.124
lh_G_temp_sup_Lateral	0.48 (0.10, 0.85)	0.013	0.124
lh_G_temp_sup_G_T_transv	0.48 (0.10, 0.86)	0.012	0.124
lh_G_cingul_Post_ventral	0.46 (0.08, 0.84)	0.016	0.131
lh_G_and_S_cingul_Ant	0.45 (0.07, 0.83)	0.018	0.141
rh_G_temp_sup_Plan_tempo	0.44 (0.07, 0.82)	0.020	0.151
rh_S_oc_temp_med_and_Lingual	0.43 (0.05, 0.80)	0.025	0.163
lh_G_cingul_Post_dorsal	0.43 (0.05, 0.80)	0.025	0.163
rh_G_and_S_cingul_Mid_Ant	0.43 (0.05, 0.80)	0.024	0.163
lh_G_precentral	0.41 (0.03, 0.78)	0.032	0.198
rh_Lat_Fis_ant_Vertical	-0.40 (-0.77, -0.02)	0.036	0.207
lh_S_orbital_med_olfact	0.39 (0.02, 0.77)	0.037	0.207
rh_G_insular_short	0.40 (0.02, 0.77)	0.036	0.207
rh_G_and_S_cingul_Mid_Post	0.39 (0.01, 0.76)	0.040	0.217
lh_G_cuneus	-0.36 (-0.73, 0.02)	0.058	0.243
lh_S_front_middle	0.36 (-0.02, 0.73)	0.058	0.243
lh_S_circular_insula_ant	0.36 (-0.02, 0.73)	0.058	0.243
rh_G_and_S_transv_frontopol	0.36 (-0.01, 0.74)	0.057	0.243
lh_S_oc_temp_med_and_Lingual	0.36 (-0.01, 0.74)	0.056	0.243
rh_G_and_S_subcentral	0.36 (-0.01, 0.74)	0.055	0.243
lh_G_and_S_frontomargin	0.37 (0.00, 0.74)	0.051	0.243
lh_S_temporal_inf	0.37 (0.00, 0.75)	0.049	0.243
lh_Pole_occipital	-0.35 (-0.72, 0.03)	0.066	0.249
rh_MeanThickness	0.35 (-0.03, 0.72)	0.066	0.249
lh_G_and_S_cingul_Mid_Ant	0.35 (-0.03, 0.72)	0.066	0.249
lh_G_front_sup	0.35 (-0.02, 0.72)	0.065	0.249
lh_MeanThickness	0.34 (-0.03, 0.71)	0.071	0.255

rh_G_cingul_Post_ventral	0.34 (-0.03, 0.72)	0.070	0.255
rh_G_pariet_inf_Supramar	0.34 (-0.04, 0.71)	0.075	0.262
rh_S_parieto_occipital	-0.33 (-0.70, 0.04)	0.081	0.269
lh_S_oc_temp_lat	0.33 (-0.05, 0.70)	0.082	0.269
lh_G_front_inf_Triangul	0.33 (-0.04, 0.71)	0.079	0.269
rh_G_oc_temp_lat_fusifor	0.33 (-0.05, 0.70)	0.084	0.270
rh_G_front_middle	0.32 (-0.06, 0.69)	0.095	0.279
lh_G_front_inf_Opercular	0.32 (-0.06, 0.69)	0.094	0.279
rh_G_precentral	0.32 (-0.06, 0.69)	0.092	0.279
lh_G_pariet_inf_Supramar	0.32 (-0.05, 0.69)	0.091	0.279
lh_G_and_S_paracentral	0.31 (-0.06, 0.68)	0.099	0.287
rh_S_suborbital	0.31 (-0.07, 0.68)	0.104	0.295
lh_Lat_Fis_post	0.29 (-0.08, 0.67)	0.120	0.333
lh_S_cingul_Marginalis	-0.27 (-0.65, 0.10)	0.149	0.362
lh_Lat_Fis_ant_Horizont	-0.27 (-0.64, 0.11)	0.158	0.362
lh_S_oc_middle_and_Lunatus	-0.26 (-0.63, 0.11)	0.166	0.362
lh_S_calcarine	-0.26 (-0.63, 0.11)	0.168	0.362
rh_S_collat_transv_post	-0.26 (-0.63, 0.11)	0.170	0.362
rh_S_oc_temp_lat	0.26 (-0.11, 0.63)	0.172	0.362
rh_S_circular_insula_ant	0.26 (-0.11, 0.63)	0.170	0.362
rh_S_circular_insula_inf	0.26 (-0.11, 0.63)	0.169	0.362
rh_G_temp_sup_G_T_transv	0.26 (-0.11, 0.64)	0.162	0.362
lh_S_circular_insula_inf	0.26 (-0.11, 0.64)	0.161	0.362
rh_G_orbital	0.27 (-0.11, 0.64)	0.156	0.362
lh_G_postcentral	0.27 (-0.10, 0.64)	0.155	0.362
rh_S_orbital_med_olfact	0.27 (-0.10, 0.64)	0.154	0.362
rh_G_front_inf_Triangul	0.27 (-0.10, 0.65)	0.147	0.362
rh_S_orbital_H_Shaped	0.28 (-0.09, 0.65)	0.141	0.362
lh_G_and_S_subcentral	0.28 (-0.09, 0.65)	0.138	0.362
rh_Lat_Fis_post	0.28 (-0.09, 0.65)	0.136	0.362
rh_G_subcallosal	-0.26 (-0.63, 0.12)	0.174	0.364
lh_G_oc_temp_lat_fusifor	0.25 (-0.12, 0.63)	0.178	0.367
lh_Lat_Fis_ant_Vertical	-0.25 (-0.62, 0.12)	0.184	0.373
rh_S_precentral_inf_part	0.24 (-0.13, 0.61)	0.207	0.388
lh_S_occipital_ant	0.24 (-0.13, 0.61)	0.206	0.388
lh_G_pariet_inf_Angular	0.24 (-0.13, 0.61)	0.205	0.388
rh_G_Ins_lg_and_S_cent_ins	0.24 (-0.13, 0.61)	0.202	0.388
lh_S_interm_prim_Jensen	0.24 (-0.13, 0.62)	0.198	0.388
rh_S_collat_transv_ant	0.24 (-0.13, 0.62)	0.195	0.388
lh_G_and_S_transv_frontopol	0.23 (-0.14, 0.61)	0.213	0.389
rh_S_front_sup	0.24 (-0.14, 0.61)	0.212	0.389
rh_S_oc_middle_and_Lunatus	-0.23 (-0.60, 0.15)	0.229	0.415
rh_G_temp_sup_Lateral	0.22 (-0.15, 0.60)	0.235	0.415
lh_S_circular_insula_sup	0.23 (-0.15, 0.60)	0.232	0.415

lh_S_intrapariet_and_P_trans	-0.22 (-0.59, 0.15)	0.238	0.415
rh_S_cingul_Marginalis	-0.22 (-0.59, 0.15)	0.241	0.415
lh_G_subcallosal	0.22 (-0.15, 0.59)	0.247	0.417
lh_S_orbital_H_Shaped	0.22 (-0.15, 0.59)	0.246	0.417
lh_G_Ins_lg_and_S_cent_ins	0.22 (-0.16, 0.59)	0.250	0.417
rh_G_oc_temp_med_Lingual	0.21 (-0.16, 0.58)	0.260	0.424
lh_S_temporal_transverse	0.21 (-0.16, 0.58)	0.259	0.424
lh_G_rectus	-0.21 (-0.58, 0.17)	0.273	0.432
lh_S_precentral_inf_part	0.21 (-0.17, 0.58)	0.273	0.432
rh_G_and_S_frontomargin	0.21 (-0.16, 0.58)	0.271	0.432
rh_G_front_inf_Opercular	0.20 (-0.17, 0.57)	0.287	0.439
rh_G_temporal_middle	0.20 (-0.17, 0.57)	0.286	0.439
rh_G_front_inf_Orbital	0.20 (-0.17, 0.57)	0.286	0.439
lh_S_collat_transv_ant	0.20 (-0.17, 0.57)	0.290	0.440
lh_S_parieto_occipital	-0.18 (-0.56, 0.19)	0.326	0.489
lh_G_occipital_sup	-0.18 (-0.56, 0.19)	0.330	0.490
rh_S_precentral_sup_part	0.17 (-0.20, 0.55)	0.354	0.520
rh_G_and_S_occipital_inf	0.16 (-0.21, 0.54)	0.382	0.550
rh_G_and_S_paracentral	0.17 (-0.21, 0.54)	0.379	0.550
lh_G_front_inf_Orbital	0.16 (-0.22, 0.53)	0.407	0.581
lh_G_temp_sup_Plan_tempo	0.15 (-0.22, 0.52)	0.416	0.582
rh_S_temporal_sup	0.15 (-0.22, 0.53)	0.412	0.582
rh_S_front_inf	0.15 (-0.22, 0.52)	0.420	0.583
rh_S_subparietal	-0.14 (-0.51, 0.23)	0.455	0.626
lh_G_and_S_occipital_inf	0.14 (-0.23, 0.51)	0.464	0.632
lh_S_precentral_sup_part	0.14 (-0.24, 0.51)	0.468	0.633
rh_S_orbital_lateral	0.13 (-0.24, 0.50)	0.480	0.642
rh_G_occipital_sup	-0.13 (-0.50, 0.24)	0.489	0.643
lh_S_temporal_sup	0.13 (-0.24, 0.50)	0.485	0.643
rh_Pole_occipital	-0.12 (-0.49, 0.25)	0.513	0.663
rh_S_interm_prim_Jensen	0.12 (-0.25, 0.49)	0.512	0.663
rh_S_circular_insula_sup	0.12 (-0.25, 0.49)	0.521	0.667
lh_S_front_sup	0.12 (-0.25, 0.49)	0.527	0.670
rh_S_oc_sup_and_transversal	-0.12 (-0.49, 0.25)	0.535	0.674
lh_G_and_S_cingul_Mid_Post	0.11 (-0.26, 0.48)	0.562	0.697
rh_S_occipital_ant	0.11 (-0.26, 0.48)	0.561	0.697
rh_S_calcarine	-0.10 (-0.47, 0.27)	0.585	0.719
rh_S_central	-0.09 (-0.47, 0.28)	0.614	0.749
lh_G_oc_temp_med_Lingual	-0.09 (-0.46, 0.29)	0.647	0.783
rh_S_intrapariet_and_P_trans	-0.08 (-0.45, 0.29)	0.657	0.783
rh_G_occipital_middle	0.08 (-0.29, 0.45)	0.658	0.783
lh_S_subparietal	0.08 (-0.29, 0.45)	0.670	0.791
lh_S_suborbital	-0.08 (-0.45, 0.29)	0.683	0.796
lh_S_collat_transv_post	-0.07 (-0.44, 0.30)	0.695	0.796

lh_G_parietal_sup	0.07 (-0.30, 0.45)	0.692	0.796
rh_G_precuneus	0.08 (-0.30, 0.45)	0.687	0.796
lh_S_oc_sup_and_transversal	-0.07 (-0.44, 0.30)	0.709	0.798
rh_S_temporal_inf	0.07 (-0.30, 0.44)	0.718	0.798
rh_Lat_Fis_ant_Horizont	0.07 (-0.30, 0.44)	0.717	0.798
lh_S_front_inf	0.07 (-0.30, 0.44)	0.715	0.798
lh_G_orbital	0.07 (-0.31, 0.44)	0.724	0.799
rh_G_pariet_inf_Angular	0.06 (-0.31, 0.43)	0.758	0.830
rh_S_temporal_transverse	0.06 (-0.32, 0.43)	0.768	0.835
rh_G_postcentral	0.05 (-0.32, 0.42)	0.790	0.853
rh_G_cuneus	-0.04 (-0.41, 0.33)	0.823	0.878
lh_S_central	0.04 (-0.33, 0.41)	0.825	0.878
lh_G_temporal_inf	0.02 (-0.35, 0.39)	0.902	0.953
lh_G_precuneus	-0.02 (-0.39, 0.35)	0.916	0.961
rh_G_temporal_inf	-0.02 (-0.39, 0.35)	0.927	0.966
lh_G_occipital_middle	0.01 (-0.36, 0.39)	0.939	0.971
rh_S_postcentral	0.01 (-0.36, 0.38)	0.960	0.986
rh_S_front_middle	0.00 (-0.37, 0.37)	0.992	0.993
lh_S_postcentral	0.00 (-0.37, 0.37)	0.992	0.993
rh_G_parietal_sup	0.00 (-0.37, 0.37)	0.993	0.993
rh_G_rectus	0.00 (-0.37, 0.38)	0.984	0.993

Table S2. Group differences in subcortical volumes between patients after COVID-19 and healthy control participants.

Region	Cohen's d (95% CI)	p	p (FDR)
Left Caudate	0.24 (-0.14, 0.61)	0.209	0.504
Right Caudate	0.17 (-0.20, 0.54)	0.364	0.504
Left Pallidum	0.46 (0.08, 0.83)	0.017	0.166
Right Pallidum	0.21 (-0.16, 0.58)	0.266	0.504
Left Putamen	0.06 (-0.31, 0.43)	0.749	0.749
Right Putamen	0.10 (-0.27, 0.47)	0.596	0.662
Left Thalamus	0.16 (-0.21, 0.53)	0.403	0.504
Right Thalamus	0.32 (-0.05, 0.70)	0.087	0.433

Table S3. Associations between cortical thickness and cognitive performance in patients after COVID-19, adjusted for sex, age, and years of education.
Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_S_orbital_med_olfact	5.73 (-0.60, 12.06)	0.29 (-0.03, 0.61)	0.085
lh_G_oc_temp_med_Parahip	-2.05 (-4.34, 0.24)	-0.26 (-0.55, 0.03)	0.089
lh_G_front_middle	6.86 (-0.84, 14.55)	0.31 (-0.04, 0.65)	0.090
rh_Pole_temporal	3.69 (-0.49, 7.87)	0.30 (-0.04, 0.64)	0.093
rh_G_temp_sup_Plan_tempo	3.71 (-0.54, 7.97)	0.30 (-0.04, 0.65)	0.096
rh_Lat_Fis_ant_Vertical	3.29 (-0.68, 7.27)	0.26 (-0.05, 0.57)	0.114
lh_G_temporal_middle	3.77 (-1.05, 8.60)	0.26 (-0.07, 0.60)	0.135
lh_Pole_temporal	3.22 (-0.90, 7.35)	0.23 (-0.06, 0.52)	0.135
lh_G_and_S_cingul_Ant	6.12 (-1.72, 13.97)	0.26 (-0.07, 0.60)	0.136
lh_S_orbital_lateral	3.54 (-1.08, 8.16)	0.27 (-0.08, 0.61)	0.142
lh_S_temporal_inf	4.25 (-1.55, 10.06)	0.24 (-0.09, 0.57)	0.160
rh_G_temp_sup_Plan_polar	2.69 (-1.49, 6.86)	0.28 (-0.16, 0.71)	0.216
rh_S_pericallosal	3.21 (-2.62, 9.05)	0.20 (-0.16, 0.57)	0.288
lh_S_pericallosal	2.45 (-2.65, 7.55)	0.15 (-0.17, 0.48)	0.354
lh_G_cingul_Post_dorsal	-2.00 (-6.19, 2.20)	-0.15 (-0.46, 0.16)	0.358
lh_G_temp_sup_G_T_transv	1.85 (-2.16, 5.86)	0.16 (-0.18, 0.50)	0.373
rh_G_oc_temp_med_Parahip	-1.22 (-4.04, 1.61)	-0.14 (-0.46, 0.18)	0.404
lh_G_temp_sup_Plan_polar	1.60 (-2.24, 5.45)	0.14 (-0.19, 0.47)	0.419
lh_G_cingul_Post_ventral	1.19 (-1.74, 4.12)	0.13 (-0.19, 0.46)	0.431
rh_G_insular_short	-2.08 (-7.61, 3.45)	-0.14 (-0.53, 0.24)	0.467
rh_G_front_sup	-2.58 (-10.13, 4.98)	-0.11 (-0.45, 0.22)	0.508
lh_G_temp_sup_Lateral	1.88 (-4.16, 7.92)	0.12 (-0.27, 0.52)	0.546
lh_G_insular_short	-0.80 (-4.72, 3.12)	-0.06 (-0.37, 0.24)	0.692
lh_G_precentral	-0.81 (-4.98, 3.36)	-0.07 (-0.41, 0.28)	0.705
rh_G_and_S_cingul_Ant	1.15 (-6.51, 8.81)	0.05 (-0.29, 0.39)	0.771
rh_G_cingul_Post_dorsal	-0.53 (-4.99, 3.93)	-0.04 (-0.38, 0.30)	0.818
rh_G_and_S_cingul_Mid_Ant	-0.78 (-7.64, 6.09)	-0.04 (-0.40, 0.31)	0.826
rh_G_and_S_cingul_Mid_Post	-0.40 (-8.34, 7.54)	-0.02 (-0.37, 0.34)	0.921
rh_S_oc_temp_med_and_Lingual	-0.30 (-7.20, 6.60)	-0.02 (-0.38, 0.35)	0.932

Table S3a. Associations between cortical thickness and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and scanner type. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_S_orbital_med_olfact	5.73 (-0.60, 12.06)	0.29 (-0.03, 0.61)	0.085
lh_G_oc_temp_med_Parahip	-2.05 (-4.34, 0.24)	-0.28 (-0.59, 0.03)	0.089
lh_G_front_middle	6.86 (-0.84, 14.55)	0.28 (-0.04, 0.60)	0.090
rh_Pole_temporal	3.69 (-0.49, 7.87)	0.28 (-0.04, 0.59)	0.093
rh_G_temp_sup_Plan_tempo	3.71 (-0.54, 7.97)	0.29 (-0.04, 0.62)	0.096
rh_Lat_Fis_ant_Vertical	3.29 (-0.68, 7.27)	0.27 (-0.06, 0.59)	0.114
lh_G_temporal_middle	3.77 (-1.05, 8.60)	0.26 (-0.07, 0.59)	0.135
lh_Pole_temporal	3.22 (-0.90, 7.35)	0.25 (-0.07, 0.57)	0.135
lh_G_and_S_cingul_Ant	6.12 (-1.72, 13.97)	0.27 (-0.07, 0.61)	0.136
lh_S_orbital_lateral	3.54 (-1.08, 8.16)	0.25 (-0.07, 0.57)	0.142
lh_S_temporal_inf	4.25 (-1.55, 10.06)	0.25 (-0.09, 0.59)	0.160
rh_G_temp_sup_Plan_polar	2.69 (-1.49, 6.86)	0.22 (-0.12, 0.57)	0.216
rh_S_pericallosal	3.21 (-2.62, 9.05)	0.19 (-0.15, 0.53)	0.288
lh_S_pericallosal	2.45 (-2.65, 7.55)	0.16 (-0.17, 0.48)	0.354
lh_G_cingul_Post_dorsal	-2.00 (-6.19, 2.20)	-0.16 (-0.49, 0.17)	0.358
lh_G_temp_sup_G_T_transv	1.85 (-2.16, 5.86)	0.15 (-0.18, 0.48)	0.373
rh_G_oc_temp_med_Parahip	-1.22 (-4.04, 1.61)	-0.14 (-0.47, 0.19)	0.404
lh_G_temp_sup_Plan_polar	1.60 (-2.24, 5.45)	0.15 (-0.20, 0.49)	0.419
lh_G_cingul_Post_ventral	1.19 (-1.74, 4.12)	0.14 (-0.20, 0.48)	0.431
rh_G_insular_short	-2.08 (-7.61, 3.45)	-0.12 (-0.46, 0.21)	0.467
rh_G_front_sup	-2.58 (-10.13, 4.98)	-0.12 (-0.46, 0.23)	0.508
lh_G_temp_sup_Lateral	1.88 (-4.16, 7.92)	0.11 (-0.25, 0.47)	0.546
lh_G_insular_short	-0.80 (-4.72, 3.12)	-0.07 (-0.40, 0.26)	0.692
lh_G_precentral	-0.81 (-4.98, 3.36)	-0.07 (-0.40, 0.27)	0.705
rh_G_and_S_cingul_Ant	1.15 (-6.51, 8.81)	0.05 (-0.28, 0.38)	0.771
rh_G_cingul_Post_dorsal	-0.53 (-4.99, 3.93)	-0.04 (-0.39, 0.31)	0.818
rh_G_and_S_cingul_Mid_Ant	-0.78 (-7.64, 6.09)	-0.04 (-0.41, 0.33)	0.826
rh_G_and_S_cingul_Mid_Post	-0.40 (-8.34, 7.54)	-0.02 (-0.36, 0.32)	0.921
rh_S_oc_temp_med_and_Lingual	-0.30 (-7.20, 6.60)	-0.02 (-0.39, 0.36)	0.932

Table S3b. Associations between cortical thickness and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and study site. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_oc_temp_med_Parahip	-3.14 (-5.75, -0.52)	-0.43 (-0.79, -0.07)	0.025
lh_S_orbital_med_olfact	5.90 (-0.52, 12.33)	0.30 (-0.03, 0.62)	0.081
rh_Lat_Fis_ant_Vertical	3.80 (-0.34, 7.94)	0.31 (-0.03, 0.65)	0.081
lh_G_front_middle	7.09 (-0.73, 14.90)	0.29 (-0.03, 0.62)	0.085
rh_G_temp_sup_Plan_tempo	3.70 (-0.61, 8.01)	0.29 (-0.05, 0.62)	0.102
rh_Pole_temporal	3.66 (-0.67, 7.99)	0.27 (-0.05, 0.60)	0.108
lh_G_and_S_cingul_Ant	6.61 (-1.42, 14.64)	0.29 (-0.06, 0.63)	0.116
lh_S_orbital_lateral	3.59 (-1.09, 8.27)	0.25 (-0.08, 0.57)	0.143
lh_S_temporal_inf	4.45 (-1.45, 10.36)	0.26 (-0.08, 0.61)	0.149
lh_G_temporal_middle	3.71 (-1.21, 8.63)	0.26 (-0.08, 0.59)	0.149
lh_Pole_temporal	3.28 (-1.14, 7.70)	0.25 (-0.09, 0.59)	0.156
rh_G_oc_temp_med_Parahip	-2.25 (-5.65, 1.15)	-0.26 (-0.65, 0.13)	0.204
rh_G_temp_sup_Plan_polar	2.62 (-1.72, 6.96)	0.22 (-0.14, 0.58)	0.245
lh_G_cingul_Post_dorsal	-2.61 (-7.11, 1.89)	-0.21 (-0.56, 0.15)	0.264
rh_S_pericallosal	3.21 (-2.71, 9.12)	0.19 (-0.16, 0.53)	0.296
lh_S_pericallosal	2.34 (-3.07, 7.76)	0.15 (-0.20, 0.50)	0.403
lh_G_temp_sup_G_T_transv	1.80 (-2.61, 6.20)	0.15 (-0.21, 0.51)	0.430
rh_G_insular_short	-2.22 (-7.84, 3.41)	-0.13 (-0.47, 0.20)	0.445
lh_G_temp_sup_Plan_polar	1.53 (-2.70, 5.75)	0.14 (-0.24, 0.52)	0.484
rh_G_front_sup	-2.75 (-10.43, 4.93)	-0.12 (-0.47, 0.22)	0.488
lh_G_cingul_Post_ventral	1.13 (-2.11, 4.38)	0.13 (-0.25, 0.51)	0.499
lh_G_temp_sup_Lateral	1.88 (-4.24, 7.99)	0.11 (-0.25, 0.48)	0.551
lh_G_insular_short	-1.24 (-5.49, 3.00)	-0.10 (-0.46, 0.25)	0.570
rh_G_cingul_Post_dorsal	-1.34 (-6.57, 3.90)	-0.11 (-0.52, 0.31)	0.620
lh_G_precentral	-0.97 (-5.24, 3.31)	-0.08 (-0.42, 0.27)	0.660
rh_G_and_S_cingul_Ant	1.70 (-6.35, 9.75)	0.07 (-0.27, 0.42)	0.682
rh_G_and_S_cingul_Mid_Ant	-0.80 (-7.76, 6.15)	-0.04 (-0.42, 0.33)	0.822
rh_S_oc_temp_med_and_Lingual	-0.64 (-7.81, 6.52)	-0.04 (-0.43, 0.36)	0.861
rh_G_and_S_cingul_Mid_Post	-0.04 (-8.30, 8.23)	-0.00 (-0.36, 0.35)	0.993

Table S3c. Associations between cortical thickness and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and comorbidity. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_oc_temp_med_Parahip	-2.52 (-4.81, -0.23)	-0.32 (-0.61, -0.03)	0.038
lh_S_orbital_lateral	3.98 (-0.61, 8.57)	0.30 (-0.05, 0.64)	0.099
lh_G_front_middle	6.55 (-1.15, 14.24)	0.29 (-0.05, 0.64)	0.105
rh_Pole_temporal	3.48 (-0.71, 7.67)	0.28 (-0.06, 0.63)	0.113
lh_S_orbital_med_olfact	5.26 (-1.15, 11.67)	0.27 (-0.06, 0.59)	0.117
rh_G_temp_sup_Plan_tempo	3.48 (-0.79, 7.75)	0.28 (-0.06, 0.63)	0.120
rh_Lat_Fis_ant_Vertical	3.10 (-0.89, 7.08)	0.24 (-0.07, 0.56)	0.137
lh_G_cingul_Post_dorsal	-3.31 (-7.68, 1.07)	-0.25 (-0.57, 0.08)	0.149
rh_G_temp_sup_Plan_polar	3.08 (-1.08, 7.23)	0.32 (-0.11, 0.75)	0.157
lh_S_temporal_inf	4.07 (-1.72, 9.86)	0.23 (-0.10, 0.56)	0.178
lh_G_and_S_cingul_Ant	5.41 (-2.59, 13.42)	0.23 (-0.11, 0.58)	0.195
lh_Pole_temporal	2.81 (-1.43, 7.05)	0.20 (-0.10, 0.50)	0.203
lh_G_temporal_middle	3.14 (-2.02, 8.29)	0.22 (-0.14, 0.58)	0.242
rh_S_pericallosal	3.17 (-2.64, 8.97)	0.20 (-0.17, 0.56)	0.293
rh_G_oc_temp_med_Parahip	-1.54 (-4.37, 1.29)	-0.17 (-0.50, 0.15)	0.295
rh_G_cingul_Post_dorsal	-2.15 (-7.06, 2.77)	-0.16 (-0.54, 0.21)	0.398
rh_G_front_sup	-3.03 (-10.56, 4.49)	-0.14 (-0.47, 0.20)	0.435
rh_G_insular_short	-2.07 (-7.57, 3.43)	-0.14 (-0.52, 0.24)	0.466
lh_G_insular_short	-1.49 (-5.51, 2.52)	-0.12 (-0.43, 0.20)	0.471
lh_G_temp_sup_Plan_polar	1.40 (-2.44, 5.25)	0.12 (-0.21, 0.46)	0.479
lh_S_pericallosal	1.70 (-3.65, 7.04)	0.11 (-0.23, 0.44)	0.538
lh_G_precentral	-1.17 (-5.35, 3.00)	-0.10 (-0.44, 0.25)	0.585
lh_G_cingul_Post_ventral	0.82 (-2.19, 3.83)	0.09 (-0.24, 0.43)	0.596
lh_G_temp_sup_Lateral	1.56 (-4.48, 7.60)	0.10 (-0.29, 0.50)	0.616
lh_G_temp_sup_G_T_transv	1.07 (-3.30, 5.45)	0.09 (-0.28, 0.47)	0.634
rh_G_and_S_cingul_Mid_Post	-1.37 (-9.41, 6.67)	-0.06 (-0.42, 0.30)	0.740
rh_S_oc_temp_med_and_Lingual	-0.92 (-7.84, 6.01)	-0.05 (-0.42, 0.32)	0.797
rh_G_and_S_cingul_Ant	0.90 (-6.73, 8.53)	0.04 (-0.30, 0.38)	0.819
rh_G_and_S_cingul_Mid_Ant	0.04 (-6.94, 7.01)	0.00 (-0.36, 0.36)	0.992

Table S3d. Associations between cortical thickness and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and body mass index. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus*.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_S_orbital_med_olfact	7.66 (0.51, 14.81)	0.39 (0.03, 0.75)	0.045
rh_Pole_temporal	3.84 (-1.03, 8.72)	0.31 (-0.08, 0.71)	0.134
lh_G_oc_temp_med_Parahip	-1.92 (-4.40, 0.57)	-0.24 (-0.56, 0.07)	0.142
lh_G_front_middle	6.38 (-2.15, 14.92)	0.29 (-0.10, 0.67)	0.154
rh_G_temp_sup_Plan_tempo	3.91 (-1.44, 9.25)	0.32 (-0.12, 0.75)	0.163
lh_G_temporal_middle	3.79 (-1.93, 9.51)	0.26 (-0.13, 0.66)	0.205
rh_G_insular_short	-3.88 (-10.25, 2.49)	-0.27 (-0.71, 0.17)	0.243
lh_S_orbital_lateral	3.14 (-2.06, 8.34)	0.24 (-0.15, 0.63)	0.247
lh_G_cingul_Post_dorsal	-2.53 (-7.13, 2.08)	-0.19 (-0.53, 0.15)	0.291
lh_G_insular_short	-2.30 (-6.58, 1.98)	-0.18 (-0.51, 0.15)	0.301
lh_S_temporal_inf	3.65 (-3.20, 10.51)	0.21 (-0.18, 0.60)	0.305
lh_Pole_temporal	2.70 (-2.56, 7.96)	0.19 (-0.18, 0.56)	0.323
rh_Lat_Fis_ant_Vertical	2.31 (-2.64, 7.26)	0.18 (-0.21, 0.57)	0.368
rh_G_front_sup	-3.78 (-11.97, 4.41)	-0.17 (-0.53, 0.20)	0.373
rh_G_and_S_cingul_Mid_Post	-4.35 (-14.04, 5.34)	-0.20 (-0.63, 0.24)	0.386
rh_G_oc_temp_med_Parahip	-1.24 (-4.30, 1.82)	-0.14 (-0.49, 0.21)	0.434
rh_G_temp_sup_Plan_polar	1.71 (-3.07, 6.50)	0.18 (-0.32, 0.68)	0.489
lh_G_and_S_cingul_Ant	3.56 (-7.53, 14.65)	0.15 (-0.32, 0.63)	0.534
lh_G_precentral	-1.44 (-6.23, 3.36)	-0.12 (-0.51, 0.28)	0.561
lh_G_temp_sup_G_T_transv	1.33 (-4.15, 6.81)	0.11 (-0.35, 0.58)	0.638
lh_G_cingul_Post_ventral	0.78 (-2.88, 4.45)	0.09 (-0.32, 0.50)	0.678
rh_G_and_S_cingul_Ant	-1.68 (-10.94, 7.58)	-0.07 (-0.49, 0.34)	0.725
lh_S_pericallosal	1.11 (-5.64, 7.85)	0.07 (-0.36, 0.50)	0.750
lh_G_temp_sup_Plan_polar	0.69 (-3.64, 5.02)	0.06 (-0.32, 0.44)	0.757
rh_S_pericallosal	0.92 (-6.57, 8.42)	0.06 (-0.41, 0.53)	0.811
rh_S_oc_temp_med_and_Lingual	-0.77 (-9.09, 7.55)	-0.04 (-0.48, 0.40)	0.857
rh_G_cingul_Post_dorsal	-0.43 (-5.47, 4.61)	-0.03 (-0.42, 0.35)	0.868
lh_G_temp_sup_Lateral	0.35 (-6.80, 7.50)	0.02 (-0.44, 0.49)	0.924
rh_G_and_S_cingul_Mid_Ant	-0.28 (-7.97, 7.41)	-0.01 (-0.41, 0.38)	0.944

Table S4a. Associations between cortical thickness and fatigue severity in patients after COVID-19, adjusted for sex, age, and scanner type. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_and_S_cingul_Ant	-76.07 (-113.44, -38.71)	-0.60 (-0.90, -0.31)	< 0.001
lh_Pole_temporal	-47.89 (-75.88, -19.90)	-0.63 (-0.99, -0.26)	0.002
lh_G_temp_sup_G_T_transv	-24.87 (-43.29, -6.45)	-0.39 (-0.68, -0.10)	0.012
rh_G_cingul_Post_dorsal	-33.28 (-59.72, -6.84)	-0.47 (-0.84, -0.10)	0.019
rh_S_pericallosal	-35.89 (-68.21, -3.57)	-0.42 (-0.79, -0.04)	0.036
lh_G_cingul_Post_ventral	-16.11 (-31.01, -1.22)	-0.33 (-0.64, -0.02)	0.041
rh_G_and_S_cingul_Mid_Post	-41.78 (-83.12, -0.45)	-0.35 (-0.69, -0.00)	0.055
lh_G_cingul_Post_dorsal	-21.50 (-46.10, 3.11)	-0.29 (-0.63, 0.04)	0.095
rh_G_and_S_cingul_Ant	-28.19 (-69.00, 12.63)	-0.23 (-0.57, 0.10)	0.184
lh_S_orbital_lateral	15.93 (-8.59, 40.46)	0.22 (-0.12, 0.56)	0.211
rh_G_front_sup	-27.95 (-73.56, 17.66)	-0.23 (-0.61, 0.15)	0.238
lh_G_temp_sup_Lateral	-16.57 (-44.52, 11.37)	-0.20 (-0.54, 0.14)	0.253
rh_G_insular_short	12.75 (-13.12, 38.63)	0.16 (-0.17, 0.49)	0.340
rh_Pole_temporal	-12.36 (-38.29, 13.58)	-0.19 (-0.58, 0.20)	0.357
lh_S_pericallosal	-9.48 (-35.39, 16.42)	-0.11 (-0.41, 0.19)	0.478
lh_G_front_middle	16.47 (-29.25, 62.18)	0.14 (-0.24, 0.51)	0.485
rh_G_temp_sup_Plan_tempo	-9.60 (-36.47, 17.26)	-0.14 (-0.55, 0.26)	0.488
rh_S_oc_temp_med_and_Lingual	-13.40 (-52.35, 25.55)	-0.13 (-0.51, 0.25)	0.504
lh_S_temporal_inf	11.14 (-21.83, 44.11)	0.12 (-0.23, 0.46)	0.512
rh_G_and_S_cingul_Mid_Ant	-15.22 (-60.99, 30.56)	-0.15 (-0.58, 0.29)	0.519
rh_G_oc_temp_med_Parahip	-5.39 (-24.30, 13.51)	-0.11 (-0.51, 0.28)	0.579
lh_G_precentral	5.73 (-16.61, 28.06)	0.09 (-0.25, 0.42)	0.618
lh_G_temp_sup_Plan_polar	-4.61 (-25.67, 16.45)	-0.07 (-0.41, 0.26)	0.671
lh_S_orbital_med_olfact	-6.35 (-43.75, 31.05)	-0.06 (-0.41, 0.29)	0.741
rh_Lat_Fis_ant_Vertical	-3.58 (-26.93, 19.77)	-0.05 (-0.39, 0.29)	0.766
lh_G_temporal_middle	-3.96 (-35.00, 27.07)	-0.05 (-0.45, 0.35)	0.804
rh_G_temp_sup_Plan_polar	-2.05 (-20.44, 16.34)	-0.04 (-0.39, 0.31)	0.828
lh_G_insular_short	-1.00 (-22.58, 20.58)	-0.01 (-0.33, 0.30)	0.928
lh_G_oc_temp_med_Parahip	-0.59 (-15.68, 14.50)	-0.01 (-0.36, 0.34)	0.940

Table S4b. Associations between cortical thickness and fatigue severity in patients after COVID-19, adjusted for sex, age, and study site. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_and_S_cingul_Ant	-80.43 (-118.14, -42.72)	-0.64 (-0.94, -0.34)	< 0.001
lh_Pole_temporal	-50.10 (-79.63, -20.58)	-0.65 (-1.04, -0.27)	0.002
lh_G_temp_sup_G_T_transv	-27.48 (-47.68, -7.29)	-0.43 (-0.75, -0.11)	0.012
rh_G_cingul_Post_dorsal	-36.47 (-65.44, -7.50)	-0.51 (-0.92, -0.10)	0.019
rh_S_pericallosal	-36.82 (-69.55, -4.09)	-0.43 (-0.80, -0.05)	0.034
lh_G_cingul_Post_ventral	-16.45 (-32.15, -0.74)	-0.34 (-0.66, -0.02)	0.048
rh_G_and_S_cingul_Mid_Post	-44.04 (-86.11, -1.98)	-0.36 (-0.71, -0.02)	0.048
lh_G_cingul_Post_dorsal	-21.43 (-47.10, 4.24)	-0.29 (-0.65, 0.06)	0.111
rh_G_and_S_cingul_Ant	-31.12 (-73.06, 10.82)	-0.26 (-0.60, 0.09)	0.155
lh_S_orbital_lateral	15.60 (-9.34, 40.53)	0.22 (-0.13, 0.56)	0.228
rh_G_front_sup	-27.81 (-73.98, 18.35)	-0.23 (-0.61, 0.15)	0.246
lh_G_temp_sup_Lateral	-16.12 (-44.60, 12.36)	-0.19 (-0.54, 0.15)	0.275
rh_G_insular_short	13.30 (-12.95, 39.54)	0.17 (-0.17, 0.50)	0.328
rh_Pole_temporal	-11.83 (-39.59, 15.94)	-0.18 (-0.60, 0.24)	0.409
lh_G_front_middle	15.56 (-31.04, 62.17)	0.13 (-0.26, 0.51)	0.517
rh_G_temp_sup_Plan_tempo	-8.99 (-36.47, 18.50)	-0.13 (-0.55, 0.28)	0.526
rh_G_and_S_cingul_Mid_Ant	-15.05 (-61.38, 31.28)	-0.14 (-0.59, 0.30)	0.529
lh_S_temporal_inf	10.81 (-22.60, 44.23)	0.11 (-0.24, 0.46)	0.530
rh_S_oc_temp_med_and_Lingual	-12.61 (-52.33, 27.10)	-0.12 (-0.51, 0.27)	0.538
lh_S_pericallosal	-8.64 (-36.45, 19.17)	-0.10 (-0.42, 0.22)	0.547
lh_G_precentral	6.87 (-16.12, 29.87)	0.10 (-0.24, 0.45)	0.562
rh_Lat_Fis_ant_Vertical	-5.15 (-29.55, 19.25)	-0.07 (-0.43, 0.28)	0.682
rh_G_oc_temp_med_Parahip	-4.57 (-26.74, 17.61)	-0.10 (-0.56, 0.37)	0.689
lh_S_orbital_med_olfact	-5.94 (-43.85, 31.97)	-0.06 (-0.41, 0.30)	0.761
lh_G_temp_sup_Plan_polar	-3.31 (-27.14, 20.51)	-0.05 (-0.44, 0.33)	0.787
lh_G_temporal_middle	-3.23 (-34.88, 28.42)	-0.04 (-0.45, 0.36)	0.843
lh_G_oc_temp_med_Parahip	0.81 (-15.88, 17.50)	0.02 (-0.37, 0.41)	0.925
rh_G_temp_sup_Plan_polar	-0.92 (-20.58, 18.73)	-0.02 (-0.39, 0.36)	0.927
lh_G_insular_short	0.86 (-22.82, 24.54)	0.01 (-0.33, 0.35)	0.943

Table S4c. Associations between cortical thickness and fatigue severity in patients after COVID-19, adjusted for sex, age, and comorbidity. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus*.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_and_S_cingul_Ant	-62.76 (-102.45, -23.07)	-0.50 (-0.81, -0.18)	0.004
lh_Pole_temporal	-26.51 (-58.99, 5.96)	-0.35 (-0.77, 0.08)	0.118
rh_G_and_S_cingul_Mid_Post	-30.40 (-68.83, 8.02)	-0.25 (-0.57, 0.07)	0.130
lh_G_temp_sup_G_T_transv	-14.70 (-34.85, 5.45)	-0.23 (-0.55, 0.09)	0.161
rh_G_insular_short	14.54 (-7.64, 36.71)	0.19 (-0.10, 0.47)	0.207
rh_S_pericallosal	-21.55 (-54.76, 11.67)	-0.25 (-0.63, 0.14)	0.212
lh_G_insular_short	11.82 (-8.88, 32.51)	0.17 (-0.13, 0.47)	0.271
rh_G_cingul_Post_dorsal	-14.66 (-44.04, 14.73)	-0.21 (-0.62, 0.21)	0.335
rh_G_and_S_cingul_Ant	-17.46 (-52.50, 17.58)	-0.14 (-0.43, 0.14)	0.335
lh_S_temporal_inf	14.15 (-15.37, 43.67)	0.15 (-0.16, 0.46)	0.354
lh_G_cingul_Post_ventral	-7.06 (-23.50, 9.39)	-0.14 (-0.48, 0.19)	0.406
lh_G_front_middle	16.46 (-23.97, 56.90)	0.14 (-0.20, 0.47)	0.430
lh_S_orbital_lateral	9.01 (-14.07, 32.09)	0.12 (-0.20, 0.45)	0.449
lh_G_oc_temp_med_Parahip	5.24 (-8.27, 18.74)	0.12 (-0.19, 0.44)	0.452
rh_G_front_sup	-15.79 (-58.57, 27.00)	-0.13 (-0.48, 0.22)	0.474
lh_G_precentral	6.77 (-13.44, 26.98)	0.10 (-0.20, 0.41)	0.516
lh_G_temp_sup_Plan_polar	6.19 (-14.00, 26.38)	0.10 (-0.23, 0.42)	0.552
lh_S_orbital_med_olfact	-9.29 (-42.09, 23.51)	-0.09 (-0.39, 0.22)	0.582
lh_S_pericallosal	7.49 (-18.98, 33.96)	0.09 (-0.22, 0.40)	0.583
lh_G_cingul_Post_dorsal	-6.95 (-31.99, 18.08)	-0.10 (-0.44, 0.25)	0.589
rh_Pole_temporal	-5.20 (-29.45, 19.04)	-0.08 (-0.44, 0.29)	0.676
rh_G_and_S_cingul_Mid_Ant	-7.56 (-48.89, 33.76)	-0.07 (-0.47, 0.32)	0.722
rh_G_oc_temp_med_Parahip	2.91 (-14.81, 20.62)	0.06 (-0.31, 0.43)	0.750
rh_G_temp_sup_Plan_polar	2.70 (-14.29, 19.69)	0.05 (-0.27, 0.38)	0.757
lh_G_temp_sup_Lateral	-4.15 (-31.51, 23.22)	-0.05 (-0.38, 0.28)	0.768
lh_G_temporal_middle	3.48 (-25.13, 32.08)	0.04 (-0.32, 0.41)	0.813
rh_Lat_Fis_ant_Vertical	-2.38 (-23.51, 18.75)	-0.03 (-0.34, 0.27)	0.826
rh_G_temp_sup_Plan_tempo	-2.77 (-27.39, 21.85)	-0.04 (-0.41, 0.33)	0.827
rh_S_oc_temp_med_and_Lingual	2.19 (-35.11, 39.49)	0.02 (-0.35, 0.39)	0.909

Table S4d. Associations between cortical thickness and fatigue severity in patients after COVID-19, adjusted for sex, age, and body mass index. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus*.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
lh_G_and_S_cingul_Ant	-65.12 (-121.89, -8.36)	-0.52 (-0.97, -0.07)	0.032
lh_G_temp_sup_G_T_transv	-23.70 (-47.53, 0.14)	-0.37 (-0.75, 0.00)	0.061
rh_G_cingul_Post_dorsal	-25.65 (-54.42, 3.13)	-0.36 (-0.76, 0.04)	0.091
lh_Pole_temporal	-30.69 (-65.58, 4.21)	-0.40 (-0.86, 0.05)	0.095
rh_G_insular_short	23.00 (-3.24, 49.23)	0.29 (-0.04, 0.63)	0.096
lh_S_orbital_lateral	16.89 (-8.44, 42.21)	0.23 (-0.12, 0.59)	0.201
lh_G_front_middle	27.11 (-17.68, 71.90)	0.22 (-0.15, 0.59)	0.245
lh_G_precentral	14.37 (-10.97, 39.71)	0.22 (-0.17, 0.60)	0.275
lh_G_cingul_Post_ventral	-9.47 (-27.22, 8.27)	-0.19 (-0.56, 0.17)	0.304
lh_G_cingul_Post_dorsal	-12.60 (-38.73, 13.53)	-0.17 (-0.53, 0.19)	0.352
rh_G_and_S_cingul_Mid_Ant	-24.49 (-76.03, 27.05)	-0.23 (-0.72, 0.26)	0.359
rh_S_oc_temp_med_and_Lingual	-19.18 (-61.05, 22.69)	-0.19 (-0.60, 0.22)	0.377
lh_G_insular_short	9.46 (-12.52, 31.44)	0.14 (-0.18, 0.45)	0.406
lh_S_orbital_med_olfact	-17.77 (-59.77, 24.23)	-0.17 (-0.56, 0.23)	0.414
lh_S_temporal_inf	14.81 (-20.33, 49.96)	0.16 (-0.21, 0.52)	0.415
rh_G_and_S_cingul_Mid_Post	-20.46 (-70.68, 29.76)	-0.17 (-0.59, 0.25)	0.431
lh_G_temp_sup_Plan_polar	8.97 (-14.14, 32.08)	0.14 (-0.23, 0.52)	0.453
rh_S_pericallosal	-15.74 (-57.99, 26.51)	-0.18 (-0.67, 0.31)	0.471
rh_G_front_sup	-21.28 (-79.29, 36.72)	-0.18 (-0.65, 0.30)	0.478
rh_Lat_Fis_ant_Vertical	8.65 (-18.11, 35.42)	0.13 (-0.26, 0.52)	0.531
rh_G_temp_sup_Plan_tempo	-8.79 (-39.23, 21.64)	-0.13 (-0.59, 0.32)	0.576
lh_S_pericallosal	6.44 (-23.60, 36.48)	0.07 (-0.27, 0.42)	0.678
rh_G_temp_sup_Plan_polar	3.41 (-17.56, 24.39)	0.07 (-0.34, 0.47)	0.752
lh_G_oc_temp_med_Parahip	1.89 (-12.72, 16.49)	0.04 (-0.30, 0.38)	0.802
rh_Pole_temporal	-3.31 (-38.46, 31.84)	-0.05 (-0.58, 0.48)	0.855
rh_G_oc_temp_med_Parahip	-1.34 (-20.21, 17.53)	-0.03 (-0.42, 0.37)	0.890
rh_G_and_S_cingul_Ant	-2.63 (-44.56, 39.29)	-0.02 (-0.37, 0.32)	0.903
lh_G_temp_sup_Lateral	-1.67 (-35.50, 32.17)	-0.02 (-0.43, 0.39)	0.924
lh_G_temporal_middle	0.48 (-40.72, 41.68)	0.01 (-0.52, 0.53)	0.982

Table S5a. Associations between cortical thickness and COVID-19 severity (WHO ordinal scale) in patients after COVID-19, adjusted for sex, age, and scanner type. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	p
lh_S_orbital_med_olfact	-5.52 (-9.38, -1.65)	0.005
rh_Lat_Fis_ant_Vertical	-3.02 (-5.27, -0.77)	0.009
lh_G_oc_temp_med_Parahip	1.91 (0.46, 3.35)	0.010
lh_G_front_middle	-5.26 (-9.50, -1.01)	0.015
lh_G_temp_sup_Lateral	-3.26 (-5.98, -0.55)	0.018
rh_G_front_sup	-4.24 (-8.34, -0.14)	0.043
lh_G_temporal_middle	-2.65 (-5.30, -0.00)	0.050
rh_G_temp_sup_Plan_tempo	-2.10 (-4.22, 0.01)	0.051
rh_G_oc_temp_med_Parahip	1.43 (-0.15, 3.01)	0.076
lh_S_temporal_inf	-2.77 (-5.92, 0.39)	0.086
lh_G_cingul_Post_ventral	1.22 (-0.20, 2.64)	0.092
lh_G_and_S_cingul_Ant	-3.50 (-7.61, 0.61)	0.095
rh_G_and_S_cingul_Mid_Post	-3.24 (-7.11, 0.63)	0.101
rh_G_cingul_Post_dorsal	1.90 (-0.58, 4.38)	0.133
rh_Pole_temporal	-1.40 (-3.38, 0.58)	0.167
lh_S_orbital_lateral	-1.40 (-3.55, 0.76)	0.203
rh_G_and_S_cingul_Ant	-2.28 (-6.08, 1.53)	0.241
lh_G_insular_short	1.31 (-0.91, 3.52)	0.249
rh_G_temp_sup_Plan_polar	-0.84 (-2.35, 0.68)	0.279
rh_S_oc_temp_med_and_Lingual	-1.74 (-4.95, 1.47)	0.288
lh_Pole_temporal	-1.10 (-3.38, 1.18)	0.344
rh_G_and_S_cingul_Mid_Ant	-1.61 (-5.37, 2.16)	0.403
rh_S_pericallosal	-1.04 (-3.89, 1.81)	0.474
lh_G_cingul_Post_dorsal	0.54 (-1.76, 2.83)	0.646
lh_S_pericallosal	0.51 (-1.92, 2.94)	0.682
lh_G_temp_sup_Plan_polar	-0.35 (-2.22, 1.51)	0.711
rh_G_insular_short	-0.25 (-2.70, 2.20)	0.843
lh_G_temp_sup_G_T_transv	-0.16 (-2.14, 1.82)	0.871
lh_G_precentral	-0.00 (-2.23, 2.23)	0.999

Table S5b. Associations between cortical thickness and COVID-19 severity (WHO ordinal scale) in patients after COVID-19, adjusted for sex, age, and study site. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	p
lh_S_orbital_med_olfact	-5.49 (-9.60, -1.38)	0.009
lh_G_temp_sup_Lateral	-3.60 (-6.48, -0.73)	0.014
lh_G_temp_sup_Plan_polar	-2.65 (-4.98, -0.32)	0.026
lh_Pole_temporal	-2.58 (-5.04, -0.12)	0.040
lh_G_front_middle	-4.75 (-9.32, -0.19)	0.041
rh_Lat_Fis_ant_Vertical	-2.38 (-4.67, -0.09)	0.042
lh_G_temporal_middle	-2.72 (-5.40, -0.05)	0.046
rh_G_front_sup	-4.27 (-8.46, -0.08)	0.046
rh_Pole_temporal	-2.09 (-4.23, 0.04)	0.055
rh_G_temp_sup_Plan_polar	-1.61 (-3.31, 0.09)	0.064
rh_G_temp_sup_Plan_tempo	-1.91 (-4.01, 0.19)	0.074
lh_S_temporal_inf	-2.90 (-6.18, 0.38)	0.083
rh_S_oc_temp_med_and_Lingual	-2.92 (-6.44, 0.60)	0.104
lh_G_and_S_cingul_Ant	-2.98 (-7.26, 1.30)	0.172
lh_S_orbital_lateral	-1.29 (-3.62, 1.04)	0.277
rh_G_and_S_cingul_Mid_Post	-2.17 (-6.14, 1.80)	0.285
lh_G_oc_temp_med_Parahip	0.84 (-0.82, 2.51)	0.321
rh_S_pericallosal	-1.28 (-4.24, 1.68)	0.397
rh_G_insular_short	-1.06 (-3.66, 1.54)	0.423
lh_G_temp_sup_G_T_transv	-0.74 (-2.75, 1.27)	0.471
lh_G_cingul_Post_ventral	0.47 (-1.08, 2.01)	0.553
rh_G_and_S_cingul_Mid_Ant	-1.04 (-4.72, 2.63)	0.579
rh_G_and_S_cingul_Ant	-1.01 (-4.98, 2.97)	0.619
lh_G_cingul_Post_dorsal	-0.61 (-3.10, 1.88)	0.630
lh_G_precentral	-0.56 (-2.87, 1.75)	0.634
lh_S_pericallosal	-0.60 (-3.13, 1.94)	0.645
lh_G_insular_short	-0.35 (-2.82, 2.12)	0.782
rh_G_cingul_Post_dorsal	0.20 (-2.60, 2.99)	0.890
rh_G_oc_temp_med_Parahip	0.03 (-1.84, 1.91)	0.972

Table S5c. Associations between cortical thickness and COVID-19 severity (WHO ordinal scale) in patients after COVID-19, adjusted for sex, age, and comorbidity. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus.*

Region	Coefficient (95% CI)	p
lh_G_temp_sup_Lateral	-4.20 (-7.09, -1.31)	0.004
rh_Lat_Fis_ant_Vertical	-3.43 (-5.83, -1.04)	0.005
lh_S_orbital_med_olfact	-5.32 (-9.17, -1.48)	0.007
lh_G_front_middle	-5.36 (-9.59, -1.13)	0.013
lh_G_oc_temp_med_Parahip	1.61 (0.21, 3.01)	0.024
rh_G_temp_sup_Plan_tempo	-2.46 (-4.61, -0.31)	0.025
lh_G_temporal_middle	-3.04 (-5.75, -0.33)	0.028
rh_G_front_sup	-4.45 (-8.63, -0.27)	0.037
lh_G_and_S_cingul_Ant	-4.26 (-8.55, 0.03)	0.051
lh_S_temporal_inf	-2.76 (-5.85, 0.33)	0.080
rh_G_oc_temp_med_Parahip	1.38 (-0.18, 2.93)	0.083
rh_G_and_S_cingul_Mid_Post	-3.38 (-7.24, 0.48)	0.086
lh_Pole_temporal	-1.70 (-4.06, 0.67)	0.159
rh_S_oc_temp_med_and_Lingual	-2.33 (-5.70, 1.03)	0.174
rh_Pole_temporal	-1.31 (-3.31, 0.69)	0.199
lh_G_cingul_Post_ventral	0.97 (-0.52, 2.45)	0.202
lh_S_orbital_lateral	-1.34 (-3.49, 0.82)	0.225
rh_G_temp_sup_Plan_polar	-0.90 (-2.47, 0.67)	0.261
rh_G_and_S_cingul_Ant	-1.97 (-5.61, 1.68)	0.290
rh_G_cingul_Post_dorsal	1.22 (-1.34, 3.77)	0.350
rh_S_pericallosal	-1.36 (-4.22, 1.50)	0.352
lh_G_temp_sup_G_T_transv	-1.06 (-3.31, 1.18)	0.353
lh_G_insular_short	0.93 (-1.39, 3.25)	0.431
rh_G_and_S_cingul_Mid_Ant	-1.31 (-4.97, 2.35)	0.484
lh_G_temp_sup_Plan_polar	-0.59 (-2.51, 1.33)	0.546
rh_G_insular_short	-0.15 (-2.53, 2.24)	0.904
lh_G_precentral	0.13 (-2.07, 2.33)	0.910
lh_G_cingul_Post_dorsal	0.12 (-2.16, 2.39)	0.920
lh_S_pericallosal	-0.12 (-2.68, 2.44)	0.928

Table S5d. Associations between cortical thickness and COVID-19 severity (WHO ordinal scale) in patients after COVID-19, adjusted for sex, age, and body mass index. *Abbreviations: lh - left hemisphere, rh - right hemisphere, S - sulcus, G - gyrus*.

Region	Coefficient (95% CI)	p
rh_Lat_Fis_ant_Vertical	-3.10 (-5.69, -0.51)	0.019
lh_G_and_S_cingul_Ant	-6.08 (-11.35, -0.82)	0.023
lh_G_insular_short	2.79 (0.31, 5.27)	0.027
lh_G_oc_temp_med_Parahip	1.50 (0.02, 2.99)	0.048
lh_G_front_middle	-4.59 (-9.16, -0.02)	0.049
lh_G_precentral	2.16 (-0.40, 4.72)	0.098
lh_S_orbital_lateral	-1.83 (-4.29, 0.64)	0.146
lh_S_orbital_med_olfact	-2.92 (-7.13, 1.30)	0.175
rh_G_and_S_cingul_Mid_Post	-3.02 (-7.43, 1.38)	0.178
lh_G_temp_sup_Lateral	-2.17 (-5.35, 1.01)	0.181
lh_G_temp_sup_G_T_transv	1.62 (-0.83, 4.08)	0.195
rh_G_oc_temp_med_Parahip	1.13 (-0.62, 2.87)	0.206
rh_S_pericallosal	-2.07 (-5.47, 1.33)	0.233
rh_G_front_sup	-2.73 (-7.25, 1.78)	0.236
lh_G_cingul_Post_ventral	0.90 (-0.73, 2.52)	0.281
rh_G_and_S_cingul_Ant	-2.05 (-5.89, 1.79)	0.294
rh_G_cingul_Post_dorsal	1.07 (-1.61, 3.74)	0.435
rh_Pole_temporal	-0.83 (-3.14, 1.48)	0.481
lh_S_temporal_inf	-1.03 (-4.38, 2.32)	0.547
rh_G_insular_short	0.76 (-1.93, 3.44)	0.581
lh_G_cingul_Post_dorsal	0.65 (-1.79, 3.09)	0.602
rh_G_temp_sup_Plan_tempo	-0.45 (-2.85, 1.96)	0.714
rh_S_oc_temp_med_and_Lingual	-0.51 (-4.01, 3.00)	0.777
lh_Pole_temporal	-0.35 (-2.99, 2.29)	0.793
rh_G_temp_sup_Plan_polar	-0.22 (-1.89, 1.45)	0.795
lh_G_temporal_middle	0.34 (-2.80, 3.49)	0.830
lh_S_pericallosal	0.20 (-2.60, 3.01)	0.887
rh_G_and_S_cingul_Mid_Ant	-0.30 (-4.64, 4.05)	0.893
lh_G_temp_sup_Plan_polar	-0.10 (-2.10, 1.91)	0.924

Table S6. Associations between hippocampus volumes and fatigue severity in patients with COVID-19.

Variable	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Adjusted for sex and age			
Left Hippocampus	0.00 (-0.01, 0.01)	0.05 (-0.33, 0.42)	0.810
Right Hippocampus	0.00 (-0.01, 0.01)	0.09 (-0.27, 0.45)	0.615
Adjusted for sex, age and scanner type			
Left Hippocampus	0.00 (-0.01, 0.02)	0.04 (-0.34, 0.41)	0.842
Right Hippocampus	0.00 (-0.01, 0.01)	0.09 (-0.28, 0.46)	0.638
Adjusted for sex, age and study site			
Left Hippocampus	0.00 (-0.01, 0.02)	0.05 (-0.33, 0.43)	0.799
Right Hippocampus	0.00 (-0.01, 0.01)	0.10 (-0.28, 0.47)	0.617
Adjusted for sex, age and comorbidity			
Left Hippocampus	0.00 (-0.01, 0.01)	0.10 (-0.22, 0.42)	0.559
Right Hippocampus	0.00 (-0.00, 0.01)	0.16 (-0.15, 0.47)	0.314
Adjusted for sex, age and body mass index			
Left Hippocampus	0.01 (-0.01, 0.02)	0.15 (-0.23, 0.54)	0.434
Right Hippocampus	0.00 (-0.01, 0.02)	0.15 (-0.22, 0.52)	0.439

Table S7. Associations between hippocampus volumes and cognitive performance, in patients with COVID-19.

Variable	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Adjusted for sex, age and years of education			
Left Hippocampus	0.000 (-0.003, 0.002)	-0.009 (-0.387, 0.369)	0.963
Right Hippocampus	0.000 (-0.002, 0.002)	0.061 (-0.306, 0.428)	0.746
Adjusted for sex, age, years of education and scanner type			
Left Hippocampus	-0.00 (-0.00, 0.00)	-0.01 (-0.40, 0.39)	0.963
Right Hippocampus	0.00 (-0.00, 0.00)	0.06 (-0.31, 0.43)	0.746
Adjusted for sex, age, years of education and study site			
Left Hippocampus	-0.00 (-0.00, 0.00)	-0.02 (-0.43, 0.38)	0.917
Right Hippocampus	0.00 (-0.00, 0.00)	0.05 (-0.33, 0.43)	0.789
Adjusted for sex, age, years of education and comorbidity			
Left Hippocampus	-0.00 (-0.00, 0.00)	-0.03 (-0.41, 0.34)	0.860
Right Hippocampus	0.00 (-0.00, 0.00)	0.02 (-0.35, 0.39)	0.911
Adjusted for sex, age, years of education and body mass index			
Left Hippocampus	-0.00 (-0.00, 0.00)	-0.04 (-0.49, 0.42)	0.870
Right Hippocampus	0.00 (-0.00, 0.00)	0.09 (-0.32, 0.50)	0.675

Table S8. Associations between hippocampus volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]).

Region	Estimate	Std. Error	t-value	p
Adjusted for sex and age				
Left Hippocampus	-106.757	136.720	-0.781	0.438
Right Hippocampus	-219.670	165.624	-1.326	0.191
Adjusted for sex, age and scanner type				
Left Hippocampus	-152.778	143.365	-1.066	0.292
Right Hippocampus	-268.414	174.121	-1.542	0.129
Adjusted for sex, age and study site				
Left Hippocampus	-182.093	146.569	-1.242	0.220
Right Hippocampus	-308.178	177.595	-1.735	0.089
Adjusted for sex, age and comorbidity				
Left Hippocampus	-108.323	138.116	-0.784	0.436
Right Hippocampus	-221.319	167.340	-1.323	0.191
Adjusted for sex, age and body mass index				
Left Hippocampus	-100.020	167.859	-0.596	0.554
Right Hippocampus	-289.299	206.710	-1.400	0.168

Table S9. Associations between subcortical volumes and fatigue severity in patients after COVID-19, adjusted for sex and age.

Region	Coefficient (95% CI)	Std, coefficient ß (95% CI)	p
Left Caudate	-0.01 (-0.02, 0.01)	-0.18 (-0.59, 0.22)	0.382
Right Caudate	0.00 (-0.02, 0.01)	-0.13 (-0.52, 0.27)	0.533
Left Pallidum	0.00 (-0.03, 0.02)	-0.08 (-0.44, 0.28)	0.674
Right Pallidum	-0.02 (-0.04, 0.01)	-0.23 (-0.61, 0.15)	0.240
Left Putamen	-0.01 (-0.02, 0.01)	-0.23 (-0.73, 0.27)	0.373
Right Putamen	0.00 (-0.02, 0.01)	-0.20 (-0.67, 0.27)	0.413
Left Thalamus	0.00 (-0.01, 0.01)	-0.07 (-0.47, 0.33)	0.744
Right Thalamus	0.00 (-0.01, 0.01)	-0.11 (-0.53, 0.30)	0.590

Table S9a. Associations between subcortical volumes and fatigue severity in patients after COVID-19, adjusted for sex, age and scanner type.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.01 (-0.02, 0.01)	-0.18 (-0.55, 0.20)	0.368
Right Caudate	-0.00 (-0.02, 0.01)	-0.12 (-0.49, 0.25)	0.527
Left Pallidum	-0.01 (-0.03, 0.02)	-0.09 (-0.46, 0.28)	0.627
Right Pallidum	-0.02 (-0.04, 0.01)	-0.24 (-0.61, 0.13)	0.220
Left Putamen	-0.01 (-0.02, 0.01)	-0.21 (-0.65, 0.23)	0.359
Right Putamen	-0.00 (-0.02, 0.01)	-0.18 (-0.60, 0.24)	0.411
Left Thalamus	-0.00 (-0.01, 0.01)	-0.08 (-0.52, 0.36)	0.716
Right Thalamus	-0.00 (-0.01, 0.01)	-0.12 (-0.55, 0.31)	0.589

Table S9b. Associations between subcortical volumes and fatigue severity in patients after COVID-19, adjusted for sex, age and study site.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.01 (-0.02, 0.01)	-0.17 (-0.58, 0.24)	0.420
Right Caudate	-0.00 (-0.02, 0.01)	-0.11 (-0.52, 0.30)	0.605
Left Pallidum	-0.01 (-0.03, 0.02)	-0.09 (-0.46, 0.29)	0.655
Right Pallidum	-0.02 (-0.04, 0.01)	-0.24 (-0.62, 0.14)	0.218
Left Putamen	-0.01 (-0.02, 0.01)	-0.21 (-0.66, 0.24)	0.367
Right Putamen	-0.00 (-0.02, 0.01)	-0.17 (-0.61, 0.27)	0.452
Left Thalamus	-0.00 (-0.01, 0.01)	-0.08 (-0.53, 0.36)	0.721
Right Thalamus	-0.00 (-0.01, 0.01)	-0.12 (-0.55, 0.32)	0.602

Table S9c. Associations between subcortical volumes and fatigue severity in patients after COVID-19, adjusted for sex, age and comorbidity.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.00 (-0.01, 0.01)	-0.08 (-0.44, 0.28)	0.668
Right Caudate	-0.00 (-0.01, 0.01)	-0.02 (-0.37, 0.33)	0.908
Left Pallidum	0.00 (-0.02, 0.02)	0.02 (-0.29, 0.34)	0.883
Right Pallidum	-0.01 (-0.03, 0.01)	-0.20 (-0.53, 0.13)	0.251
Left Putamen	-0.00 (-0.02, 0.01)	-0.13 (-0.58, 0.31)	0.552
Right Putamen	-0.00 (-0.01, 0.01)	-0.03 (-0.45, 0.40)	0.904
Left Thalamus	-0.00 (-0.01, 0.00)	-0.15 (-0.50, 0.19)	0.397
Right Thalamus	-0.00 (-0.01, 0.00)	-0.07 (-0.43, 0.29)	0.691

Table S9d. Associations between subcortical volumes and fatigue severity in patients after COVID-19, adjusted for sex, age and body mass index.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.01 (-0.02, 0.01)	-0.23 (-0.63, 0.18)	0.280
Right Caudate	-0.00 (-0.02, 0.01)	-0.11 (-0.52, 0.30)	0.600
Left Pallidum	-0.00 (-0.02, 0.02)	-0.04 (-0.41, 0.33)	0.830
Right Pallidum	-0.01 (-0.04, 0.02)	-0.16 (-0.59, 0.28)	0.479
Left Putamen	-0.01 (-0.02, 0.00)	-0.34 (-0.83, 0.15)	0.187
Right Putamen	-0.01 (-0.02, 0.01)	-0.21 (-0.69, 0.28)	0.415
Left Thalamus	-0.00 (-0.01, 0.01)	-0.08 (-0.50, 0.34)	0.721
Right Thalamus	-0.00 (-0.01, 0.01)	-0.13 (-0.58, 0.31)	0.564

Table S10. Associations between subcortical volumes and cognitive performance in patients after COVID-19, adjusted for sex, age, and years of education.

Region	Coefficient (95% CI)	Std, coefficient ß (95% CI)	p
Left Caudate	0.000 (-0.003, 0.003)	0.03 (-0.41, 0.47)	0.903
Right Caudate	-0.001 (-0.004, 0.002)	-0.18 (-0.61, 0.24)	0.401
Left Pallidum	0.001 (-0.003, 0.005)	0.10 (-0.26, 0.47)	0.583
Right Pallidum	0.001 (-0.004, 0.005)	0.05 (-0.34, 0.43)	0.819
Left Putamen	0.000 (-0.003, 0.002)	-0.08 (-0.58, 0.43)	0.765
Right Putamen	0.000 (-0.002, 0.002)	0.06 (-0.39, 0.51)	0.781
Left Thalamus	0.000 (-0.001, 0.001)	0.05 (-0.35, 0.45)	0.799
Right Thalamus	0.000 (-0.001, 0.002)	0.07 (-0.35, 0.48)	0.755

Table S10a. Associations between subcortical volumes and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and scanner type.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	0.00 (-0.00, 0.00)	0.03 (-0.41, 0.46)	0.903
Right Caudate	-0.00 (-0.00, 0.00)	-0.18 (-0.59, 0.23)	0.401
Left Pallidum	0.00 (-0.00, 0.01)	0.10 (-0.26, 0.47)	0.583
Right Pallidum	0.00 (-0.00, 0.01)	0.04 (-0.33, 0.42)	0.819
Left Putamen	-0.00 (-0.00, 0.00)	-0.08 (-0.58, 0.42)	0.765
Right Putamen	0.00 (-0.00, 0.00)	0.07 (-0.39, 0.53)	0.781
Left Thalamus	0.00 (-0.00, 0.00)	0.06 (-0.37, 0.48)	0.799
Right Thalamus	0.00 (-0.00, 0.00)	0.07 (-0.37, 0.51)	0.755

Table S10b. Associations between subcortical volumes and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and study site.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.00 (-0.00, 0.00)	-0.01 (-0.48, 0.47)	0.976
Right Caudate	-0.00 (-0.00, 0.00)	-0.26 (-0.72, 0.20)	0.273
Left Pallidum	0.00 (-0.00, 0.01)	0.10 (-0.27, 0.48)	0.587
Right Pallidum	0.00 (-0.00, 0.01)	0.05 (-0.34, 0.43)	0.814
Left Putamen	-0.00 (-0.00, 0.00)	-0.08 (-0.59, 0.43)	0.753
Right Putamen	0.00 (-0.00, 0.00)	0.05 (-0.44, 0.53)	0.856
Left Thalamus	0.00 (-0.00, 0.00)	0.06 (-0.37, 0.50)	0.778
Right Thalamus	0.00 (-0.00, 0.00)	0.08 (-0.37, 0.52)	0.734

Table S10c. Associations between subcortical volumes and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and comorbidity.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	-0.00 (-0.00, 0.00)	-0.08 (-0.56, 0.39)	0.730
Right Caudate	-0.00 (-0.00, 0.00)	-0.30 (-0.74, 0.14)	0.193
Left Pallidum	0.00 (-0.00, 0.00)	0.07 (-0.30, 0.44)	0.712
Right Pallidum	0.00 (-0.00, 0.00)	0.01 (-0.38, 0.40)	0.961
Left Putamen	-0.00 (-0.00, 0.00)	-0.14 (-0.65, 0.37)	0.594
Right Putamen	-0.00 (-0.00, 0.00)	-0.01 (-0.48, 0.45)	0.952
Left Thalamus	0.00 (-0.00, 0.00)	0.06 (-0.33, 0.46)	0.754
Right Thalamus	0.00 (-0.00, 0.00)	0.05 (-0.36, 0.47)	0.802

Table S10d. Associations between subcortical volumes and cognitive performance in patients after COVID-19, adjusted for sex, age, years of education and body mass index.

Region	Coefficient (95% CI)	Std. coefficient ß (95% CI)	p
Left Caudate	0.00 (-0.00, 0.00)	0.01 (-0.49, 0.52)	0.955
Right Caudate	-0.00 (-0.00, 0.00)	-0.28 (-0.76, 0.20)	0.271
Left Pallidum	0.00 (-0.00, 0.01)	0.06 (-0.38, 0.50)	0.801
Right Pallidum	-0.00 (-0.01, 0.01)	-0.07 (-0.55, 0.42)	0.794
Left Putamen	-0.00 (-0.00, 0.00)	-0.22 (-0.80, 0.36)	0.469
Right Putamen	-0.00 (-0.00, 0.00)	-0.06 (-0.59, 0.48)	0.837
Left Thalamus	0.00 (-0.00, 0.00)	0.01 (-0.47, 0.49)	0.975
Right Thalamus	0.00 (-0.00, 0.00)	0.03 (-0.47, 0.52)	0.911

Table S11. Associations between subcortical volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]), adjusted for sex and age.

Region	Coefficient (95% CI)	Z	p
Left Caudate	-0.001 (-0.003, 0.001)	-0.77	0.439
Right Caudate	-0.001 (-0.003, 0.001)	-0.75	0.451
Left Pallidum	-0.002 (-0.004, 0.001)	-1.17	0.244
Right Pallidum	-0.001 (-0.004, 0.003)	-0.36	0.722
Left Putamen	-0.001 (-0.003, 0.000)	-1.66	0.098
Right Putamen	-0.001 (-0.002, 0.001)	-1.21	0.225
Left Thalamus	-0.001 (-0.002, 0.000)	-2.39	0.017
Right Thalamus	-0.002 (-0.003, 0.000)	-2.57	0.010

Table S11a. Associations between subcortical volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]), adjusted for sex, age and scanner type.

Region	Coefficient (95% CI)	Z	p
Left Caudate	-0.001 (-0.003, 0.001)	-0.92	0.359
Right Caudate	-0.001 (-0.003, 0.001)	-0.84	0.399
Left Pallidum	-0.003 (-0.006, 0.001)	-1.63	0.103
Right Pallidum	-0.001 (-0.004, 0.002)	-0.74	0.458
Left Putamen	-0.002 (-0.004, 0.000)	-1.86	0.063
Right Putamen	-0.001 (-0.002, 0.001)	-1.18	0.238
Left Thalamus	-0.002 (-0.003, -0.000)	-2.57	0.010
Right Thalamus	-0.002 (-0.004, -0.000)	-2.42	0.015

Table S11b. Associations between subcortical volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]), adjusted for sex, age and study site.

Region	Coefficient (95% CI)	Z	p
Left Caudate	-0.001 (-0.003, 0.001)	-1.30	0.192
Right Caudate	-0.001 (-0.004, 0.001)	-1.36	0.172
Left Pallidum	-0.003 (-0.006, 0.001)	-1.59	0.111
Right Pallidum	-0.001 (-0.004, 0.002)	-0.56	0.575
Left Putamen	-0.002 (-0.004, 0.000)	-1.78	0.075
Right Putamen	-0.001 (-0.002, 0.000)	-1.41	0.159
Left Thalamus	-0.002 (-0.003, -0.000)	-2.58	0.010
Right Thalamus	-0.002 (-0.004, -0.000)	-2.45	0.014

Table S11c. Associations between subcortical volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]), adjusted for sex, age and comorbidity.

Region	Coefficient (95% CI)	Z	p
Left Caudate	-0.001 (-0.003, 0.001)	-0.79	0.427
Right Caudate	-0.001 (-0.002, 0.001)	-0.77	0.444
Left Pallidum	-0.002 (-0.005, 0.001)	-1.19	0.233
Right Pallidum	-0.001 (-0.004, 0.003)	-0.33	0.741
Left Putamen	-0.001 (-0.003, 0.000)	-1.67	0.096
Right Putamen	-0.001 (-0.002, 0.000)	-1.29	0.198
Left Thalamus	-0.001 (-0.003, -0.000)	-2.37	0.018
Right Thalamus	-0.002 (-0.003, -0.000)	-2.59	0.010

Table S11d. Associations between subcortical volumes and COVID-19 severity (WHO Ordinal Scale 4-6 [no invasive ventilation] vs. 7-9 [invasive ventilation]), adjusted for sex, age and body mass index.

Region	Coefficient (95% CI)	Z	p
Left Caudate	-0.001 (-0.003, 0.001)	-0.86	0.388
Right Caudate	-0.001 (-0.003, 0.002)	-0.66	0.511
Left Pallidum	-0.001 (-0.005, 0.003)	-0.55	0.581
Right Pallidum	-0.001 (-0.006, 0.003)	-0.54	0.588
Left Putamen	-0.002 (-0.004, 0.001)	-1.51	0.131
Right Putamen	-0.000 (-0.002, 0.001)	-0.42	0.675
Left Thalamus	-0.001 (-0.002, 0.000)	-1.93	0.053
Right Thalamus	-0.002 (-0.004, -0.000)	-2.03	0.042

Table S12. Baseline characteristics of patients with missing and complete Fatigue Severity Scale (FSS).

Characteristic	FSS missing N = 15	FSS complete N = 42	p-value
Sex			0.354
male	8 (53%)	28 (68%)	
female	7 (47%)	13 (32%)	
Age (years)	53 ± 13	52 ± 13	0.909
Years of education	13.08 ± 3.73	15.28 ± 2.36	0.064
Comorbidity			0.523
none	6 (40%)	13 (31%)	
any	9 (60%)	29 (69%)	

Table S13. Baseline characteristics of patients with missing and complete Montreal Cognitive Assessment (MoCA).

Characteristic	MoCA missing N = 17	MoCA complete N = 40	p-value
Sex			>0.999
male	11 (65%)	25 (64%)	
female	6 (35%)	14 (36%)	
Age (years)	50 ± 10	54 ± 14	0.276
Years of education	14.86 ± 2.68	14.69 ± 2.98	0.850
Comorbidity			0.152
none	8 (47%)	11 (28%)	
any	9 (53%)	29 (73%)	