Supplementary Table 2-1. Association between conflicts with family and friends and academic problems owing to smartphone use, unhealthy behaviors, and mental health status among boys

Variables	Smoking		Drinking		Physical inactivity ≥3 days/week		Skipping breakfast ≥5 times/week		Eating fast food ≥3 times/week	
	N (%)	OR (95% CI)*	N (%)	OR (95% CI)a	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*
Severe conflicts with family owing to smartphone use										
No	1,880 (9.2)	1.00	3,847 (18.5)	1.00	16,993 (79.9)	1.00	4,991 (23.1)	1.00	4,280 (20.4)	1.00
Yes	548 (10.2)	1.30 (1.16−1.47)	988 (18.6)	1.17 (1.07−1.28)	4,355 (81.3)	1.16 (1.07−1.27)	1,138 (21.0)	0.89 (0.83−0.96)	1,372 (26.1)	1.40 (1.30−1.50)
Severe conflicts with friends owing to smartphone use										
No	1,815 (8.8)	1.00	3,689 (17.6)	1.00	17,004 (79.1)	1.00	5,021 (23.0)	1.00	4,337 (20.4)	1.00
Yes	613 (11.9)	1.13 (1.01−1.27)	1,146 (22.5)	1.08 (0.99−1.18)	4,344 (84.4)	1.32 (1.20−1.45)	1,108 (21.6)	0.93 (0.85−1.00)	1,315 (26.0)	1.31 (1.22−1.42)
Academic problems owing to smartphone use										
No	2,251 (9.0)	1.00	4,587 (18.1)	1.00	20,739 (80.2)	1.00	5,918 (22.6)	1.00	5,402 (21.2)	1.00
Yes	177 (23.2)	3.07 (2.49−3.78)	248 (32.7)	2.37 (1.99−2.83)	609 (78.3)	0.93 (0.78−1.12)	211 (27.4)	1.21 (1.02−1.43)	250 (32.5)	1.74 (1.48−2.03)

Variables	Sleep disturbances		Stress		Depressive symptoms		Suicide ideation		Suicide attempt	
	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)†	N (%)	OR (95% CI)‡	N (%)	OR (95% CI)‡
Severe conflicts with family owing to smartphone use										
No	14,640 (69.2)	1.00	5,965 (27.9)	1.00	3,862 (18.2)	1.00	1,695 (7.9)	1.00	334 (1.5)	1.00
Yes	3,909 (73.6)	1.35 (1.25−1.46)	2,181 (40.3)	1.79 (1.67−1.92)	1,564 (28.9)	1.56 (1.44−1.70)	805 (14.8)	1.44 (1.28−1.62)	165 (3.0)	1.38 (1.11−1.71)
Severe conflicts with friends owing to smartphone use										
No	14,453 (67.6)	1.00	6,037 (27.8)	1.00	3,908 (18.2)	1.00	1,755 (8.1)	1.00	371 (1.7)	1.00
Yes	4,096 (80.0)	1.59 (1.47−1.73)	2,109 (40.9)	1.71 (1.59−1.83)	1,518 (29.0)	1.46 (1.33−1.60)	745 (14.2)	1.31 (1.16−1.48)	128 (2.5)	1.07 (0.85−1.35)
Academic problems owing to smartphone use										
No	17,978 (70.0)	1.00	7,750 (29.9)	1.00	5,079 (19.7)	1.00	2,333 (8.9)	1.00	441 (1.7)	1.00
Yes	571 (73.9)	1.25 (1.06−1.48)	396 (50.0)	2.28 (1.94−2.68)	347 (45.7)	2.78 (2.31−3.34)	167 (22.0)	1.38 (1.10−1.73)	58 (7.2)	2.18 (1.55−3.08)

*adjusted for school year, perceived academic record, family structure, parental educational level, perceived economic status, and place of residence, †Adjusted for school year, perceived academic record, family structure, parental educational level, perceived economic status, place of residence, and stress, ‡adjusted for school year, perceived academic record, family structure, parental educational level, perceived economic status, place of residence, stress, and depressive symptoms. OR: odds ratio, CI: confidence interval

Supplementary Table 2-2. Association between conflicts with family and friends and academic problems owing to smartphone use, unhealthy behaviors, and mental health status among girls

Variables	Smoking		Drinking		Physical inactivity ≥3 days/week		Skipping breakfast ≥5 times/week		Eating fast food ≥3 times/week	
	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*
Severe conflicts with family owing to smartphone use										
No	557 (2.8)	1.00	2,711 (13.5)	1.00	19,340 (92.5)	1.00	5,072 (24.2)	1.00	3,723 (18.0)	1.00
Yes	254 (3.8)	1.58 (1.33−1.88)	998 (15.5)	1.41 (1.29−1.54)	6,127 (92.9)	1.16 (1.03−1.30)	1,580 (23.9)	0.99 (0.92−1.06)	1,525 (23.6)	1.43 (1.32−1.55)
Severe conflicts with friends owing to smartphone use										
No	560 (3.0)	1.00	2,368 (12.7)	1.00	17,654 (91.8)	1.00	4,605 (23.7)	1.00	3,299 (17.3)	1.00
Yes	251 (3.0)	0.85 (0.72−1.00)	1,341 (16.7)	1.15 (1.05−1.25)	7,813 (94.3)	1.42 (1.26−1.60)	2,047 (24.8)	1.04 (0.97−1.11)	1,949 (23.9)	1.44 (1.34−1.55)
Academic problems owing to smartphone use										
No	706 (2.7)	1.00	3,455 (13.6)	1.00	24,442 (92.7)	1.00	6,325 (23.9)	1.00	4,933 (19.1)	1.00
Yes	105 (9.4)	3.43 (2.50−4.70)	254 (22.6)	2.18 (1.84−2.60)	1,025 (91.5)	1.00 (0.78−1.27)	327 (29.0)	1.20 (1.02−1.42)	315 (27.6)	1.58 (1.36−1.83)

Variables	Sleep disturbances		Stress		Depressive symptoms		Suicide ideation		Suicide attempt	
	N (%)	OR (95% CI)*	N (%)	OR (95% CI)*	N (%)	OR (95% CI)†	N (%)	OR (95% CI)‡	N (%)	OR (95% CI)‡
Severe conflicts with family owing to smartphone use										
No	16,816 (80.6)	1.00	8,652 (40.9)	1.00	5,599 (26.7)	1.00	2,550 (12.1)	1.00	524 (2.4)	1.00
Yes	5,625 (85.6)	1.57 (1.44−1.71)	3,788 (57.0)	2.01 (1.89−2.14)	2,825 (42.3)	1.69 (1.58−1.81)	1,664 (24.8)	1.65 (1.52−1.80)	364 (5.4)	1.47 (1.25−1.72)
Severe conflicts with friends owing to smartphone use										
No	15,243 (79.4)	1.00	7,923 (40.7)	1.00	5,197 (26.8)	1.00	2,600 (13.4)	1.00	593 (3.1)	1.00
Yes	7,198 (86.9)	1.49 (1.37−1.63)	4,517 (53.9)	1.62 (1.53−1.71)	3,227 (38.5)	1.43 (1.34−1.53)	1,614 (19.0)	1.16 (1.07−1.26)	295 (3.4)	0.88 (0.75−1.03)
Academic problems owing to smartphone use										
No	21,480 (81.6)	1.00	11,707 (44.0)	1.00	7,787 (29.4)	1.00	3,857 (14.5)	1.00	783 (2.9)	1.00
Yes	961 (85.8)	1.53 (1.25−1.88)	733 (64.3)	2.34 (2.02−2.71)	637 (56.8)	2.50 (2.19−2.86)	357 (31.6)	1.42 (1.18−1.70)	105 (9.2)	1.65 (1.26−2.16)

*adjusted for gender, school year, perceived academic record, family structure, parental educational level, perceived economic status, and place of residence, †adjusted for gender, school year, perceived academic record, family structure, parental educational level, perceived economic status, place of residence, and stress, ‡adjusted for gender, school year, perceived academic record, family structure, parental educational level, perceived economic status, place of residence, stress, and depressive symptoms. OR: odds ratio, CI: confidence interval