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School Phone Bans and Adolescent Mental Health in Iceland

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Abstract

IMPORTANCE Concerns about adolescent smartphone use and mental health have prompted many schools to implement mobile phone bans, but evidence of their effects remains mixed.

OBJECTIVE To examine whether schoolwide mobile phone bans were associated with changes in mental health and associated social and behavioral outcomes among adolescents in Iceland.

DESIGN, SETTING, AND PARTICIPANTS This repeated cross-sectional study used difference-in-differences analyses of data from 70 schools across 3 waves of the nationwide Youth in Iceland school survey. The surveys were administered to adolescents aged 13 to 15 years in February 2016, February 2018, and November 2023. Analyses were conducted from February 1, 2025, to January 30, 2026.

EXPOSURE Schoolwide mobile phone bans prohibiting student phone use during school hours. Between 2018 and 2023, 22 of 70 schools implemented a phone ban.

MAIN OUTCOMES AND MEASURES Primary outcomes were depressive symptoms, anxiety, hostility, and mental well-being. Secondary outcomes were perceived peer support, screen use (social media use, gaming alone, gaming with friends, and video watching), and bullying (in person and cyberbullying).

RESULTS Among 23 938 adolescent observations across the 3 study years, 11 964 (50.0%) were boys; the mean (SD) age was 13.98 (0.82) years. In the postpolicy period from 2018 to 2023, schoolwide mobile phone bans were not associated with meaningful changes in depressive symptoms (β, 0.65 [95% CI, 0.01-1.30]), anxiety (β, 0.21 [95% CI, −0.08 to 0.50]), hostility (β, 0.23 [95% CI, −0.12 to 0.59]), and mental well-being (β, −0.52 [95% CI, −1.08 to 0.03]). Results were similar in gender-stratified analyses and for the secondary outcomes. Sensitivity analyses examining timing of implementation and more stringent phone restriction criteria were consistent with the main findings.

CONCLUSIONS AND RELEVANCE In this repeated cross-sectional study of adolescents in Iceland, schoolwide mobile phone bans were not associated with meaningful changes in adolescent mental health or related social and behavioral outcomes. These findings suggest that school phone bans implemented in isolation may be insufficient to improve adolescent mental health at the population level.

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Key Points

Question Are schoolwide mobile phone bans associated with changes in adolescent mental health among adolescents in Iceland?

Findings In this repeated cross-sectional study using a difference-in-differences analysis of 23 938 adolescent observations from 70 schools, schoolwide mobile phone bans were not associated with significant changes in mental health (depressive symptoms, anxiety, hostility, or mental well-being) in the full sample or in gender-stratified analyses.

Meaning These findings suggest that schoolwide mobile phone bans, when implemented alone, may be insufficient to improve adolescent mental health at the population level.

+ Supplemental content

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Introduction

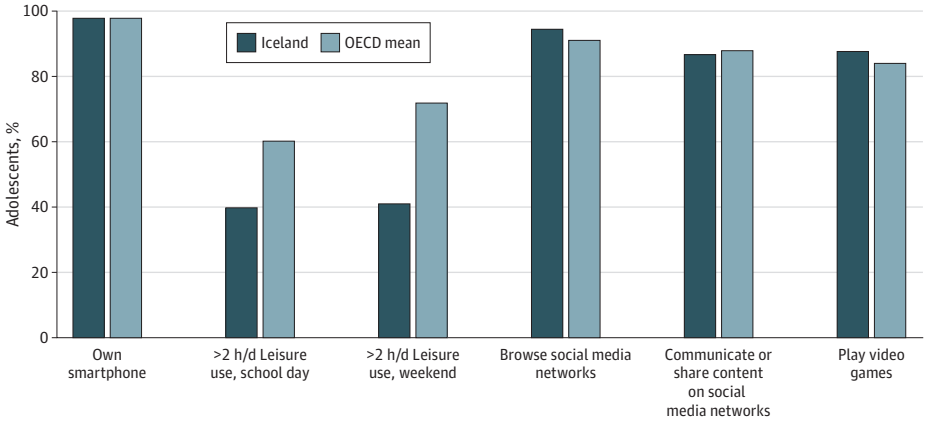
Among countries in the Organisation for Economic Co-operation and Development, an estimated 98% of adolescents aged 15 years owned a smartphone in 2022, and about half reported digital device use of at least 30 hours per week (**Figure 1**).[1] Screen use differs by gender, with girls spending more time on social media and boys spending more time gaming.[2,3] During the same period, adolescent mental health problems have increased globally,[4] including in Iceland.[5,6] Although associations between screen use and mental health are generally small and mixed, evidence suggests that some forms of screen use may be linked to poorer mental health, particularly among girls.[7-9]

Recent data show that adolescents spend more than 1 hour per day on smartphones during school hours, with social media accounting for the largest use.[10,11] In response, schools in many countries have introduced phone restrictions or bans in the hope of improving adolescent well-being and academic outcomes.[12,13] These policies typically restrict students' access to or use of phones during school hours. By reducing digital distraction during the school day, such restrictions may improve the school social environment by creating more opportunities for face-to-face interaction, peer engagement, and school connectedness.[14] However, their implementation has outpaced the evidence supporting their effectiveness.[13,15] Clarifying whether school phone bans are associated with improvements in adolescent mental health and related behaviors is therefore important for policy and practice.

Research on school phone restrictions has focused mainly on academic outcomes, with mixed findings.[13,15] Far fewer population-based or nationally representative studies have examined mental health or related behavioral outcomes. In a UK study, phone restriction policies were not associated with differences in mental health, sleep, physical activity, academic attainment, disruptive classroom behavior, or daily social media use among adolescents aged 12 to 15 years.[16] In contrast, a smaller study from South Australia evaluating a state-mandated phone ban introduced in 2023 reported small but significant reductions in psychological distress, including symptoms of depression and anxiety, and in negative affect.[17] A recent study from Norway reported that smartphone bans were associated with reduced bullying, reduced mental health care use among girls, and some improvements in girls' academic outcomes, particularly among those from lower socioeconomic backgrounds.[18] A large, multistate US study of lockable phone pouches found null effects on academic outcomes and no improvement in perceived online bullying.[19] Other studies based on smaller or nonrepresentative samples have also reported inconsistent findings.[13]

In this repeated cross-sectional study using difference-in-differences (DiD) analyses, we used population-based survey data to examine whether schoolwide phone bans were associated with changes in adolescent mental health and associated social and behavioral outcomes (perceived peer

Figure 1. Bar Graph Showing Smartphone Ownership and Digital Media Use in Iceland vs the Organisation for Economic Co-operation and Development (OECD) Mean



Bars represent percentages of adolescents aged 15 years of medium socioeconomic status reporting each digital device access or use indicator, based on 2022 OECD data.[1]

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support, bullying, and daily screen use) among adolescents in Iceland aged 13 to 15 years. In Iceland, school phone use policies have been adopted at the school level rather than under a national mandate, with notable variation in timing and stringency across schools. We analyzed data collected in 2016, 2018, and 2023, allowing comparison of prepolicy and postpolicy outcome trends in schools that did and did not implement phone bans. To our knowledge, this study is the first to use multiple prepolicy waves of nationwide self-reported survey data to estimate school-level DiD associations between phone ban adoption and adolescent mental health, mental well-being, perceived peer support, different types of screen use, and bullying.

Methods

This cross-sectional study was approved by the National Bioethics Committee of Iceland, and the protocol was registered with the Personal Data Protection Authority. Study data were obtained from the Youth in Iceland surveys, an established repeated nationwide school-based survey of adolescents. Students were informed that participation was voluntary, responses were anonymous and confidential, and they could decline any question or withdraw at any time. Students provided consent by voluntarily completing the survey. Parents or guardians were informed in advance and given the opportunity to opt their child out by notifying the school. The study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Participants and Study Design

We analyzed 3 Youth in Iceland survey waves administered during regular class time in February 2016, February 2018, and November 2023 to students aged 13 to 15 years in 70 schools. The 2016 and 2018 waves served as prepolicy observations and the 2023 wave served as the postpolicy observation, with this interval selected to allow sufficient time for ban implementation and potential effects to emerge. In 2016 and 2018, students completed paper questionnaires returned in sealed envelopes. In 2023, the survey was completed electronically. Responses were anonymous in all waves.

In this study, the analytic sample was restricted to schools participating in all 3 survey waves. The sample was broadly representative of the national adolescent population by age and gender, although adolescents residing in the capital region were overrepresented relative to national benchmarks (eFigures 1 and 2 in Supplement 1), consistent with the greater retention of capital-region schools in the analytic sample noted above.

There is no national mandate on smartphone use in Icelandic primary or lower secondary schools. Decisions on phone policies are made at the school level. School phone use policies were obtained from school websites and supplemented by structured telephone interviews with staff knowledgeable about policies that apply to students in grades 8 to 10. Information was collected on whether a ban was in place, year of implementation, specific rules, and enforcement; however, schools' reasons for adopting phone ban policies were not systematically collected. Schools classified as having a phone ban explicitly prohibited student phone use during school hours, with students being required to leave phones at home or store them in lockers or schoolbags. Enforcement typically involved recording infractions in school communication platforms visible to parents, with repeated violations leading to parent meetings. By the 2023 survey, 22 of the 70 schools in the analytic sample had implemented a phone ban, with most bans introduced between 2019 (n = 6) and 2023 (n = 7). Schools without bans had fewer formal restrictions, often prohibiting phone use during lessons but allowing use during breaks and generally permitting students to carry phones during the school day.

Study Measures

Survey items are listed in eTable 1 in Supplement 1. Covariates included school grade (8-10), household status (2 caregivers vs other arrangements), language spoken at home (Icelandic only vs another language alone or with Icelandic), and school municipality (of 13 municipalities). Household

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status, language spoken at home, and school municipality were included as proxies for socioeconomic context, given their established associations with adolescent socioeconomic background in Iceland. Gender was self-reported as binary (girl or boy) in 2016 and 2018 and expanded to include additional nonbinary options in 2023. Because nonbinary options were available only in 2023 and were selected by few participants, gender-stratified analyses were restricted to girls and boys.

The primary outcomes were depressive symptoms, anxiety, and hostility in the preceding week assessed with the Symptom Checklist–90–Revised.[20] The depression subscale comprised 10 items (score range, 10-40), and the anxiety and hostility subscales comprised 5 items each (score range, 5-25). Item responses were summed, with higher scores indicating greater symptom severity. Internal consistency was good to excellent (Cronbach α, 0.91 for depression, 0.80 for anxiety, and 0.83 for hostility). Mental well-being was assessed using the Short Warwick-Edinburgh Mental Well-being Scale.[21] Participants rated 7 statements reflecting positive functioning during the past 2 weeks (range, 7-35; Cronbach α, 0.85), with higher scores indicating better well-being.

The secondary outcomes were perceived peer social support, bullying, and screen use. Perceived peer social support was measured with the 5-item Perceived Peer Support Scale[22] (range, 5-20; Cronbach α, 0.86), which captures perceived ease of obtaining social and emotional support from friends and peers. Items were summed, with higher scores indicating greater perceived support.

Cyberbullying was assessed using a single item measuring lifetime frequency of receiving offensive or hurtful messages from an individual or group (1 indicates never; 5, ≥5 times). In-person bullying was assessed using 2 items capturing experiences of being teased or physically harmed by peers in the past 12 months (1 indicates never; 5, ≥5 times). For analysis, bullying outcomes were dichotomized as no occurrence (0) vs any occurrence (1).

Screen use was self-reported as the mean daily time spent using social media, playing video games alone, playing video games with friends, and watching videos or films. Responses were recorded on categorical 8-point scales ranging from 0 to 6 hours or more per day. Screen use items referred to typical daily use and were not restricted to school days or weekends specifically. Type of screen use was examined separately to allow detection of outcome-specific effects.

Statistical Analysis

Data were analyzed from February 1, 2025, to January 30, 2026. Statistical analyses were conducted using R, version 4.4.2 (R Project for Statistical Computing). We evaluated associations between schoolwide phone bans and adolescent outcomes using a DiD framework with school and survey year as fixed effects.[23] Additional details about the study design and the statistical and sensitivity analyses are provided in the eMethods in Supplement 1. Because we used repeated cross-sectional data rather than longitudinal observations of the same individuals, the DiD estimates compared changes in school-level outcome trends over time, as captured through repeated individual responses within schools rather than within-person change.

For each outcome, we fit models of the form using the following equation:

$$Y_{ist} = \beta_0 + \beta_1(\text{Post}_t \times \text{Treat}_s) + \gamma_s + \delta_t + X_{ist}\theta + \varepsilon_{ist}$$

where i indicates students, s indicates schools, and t indicates survey years; γ_s denotes school fixed effects capturing time-invariant school characteristics; and δ_t denotes survey year fixed effects capturing national period effects common across schools. Treat_s indicates schools that adopted a phone ban, and Post_t indicates the postpolicy period. Standard errors were clustered at the school level. Covariates X_{ist} included grade, language spoken at home, and household composition. Models were estimated in the full sample and stratified by gender.

The coefficient β_1 represents the mean between-school difference in change over time associated with phone ban adoption under the parallel trends assumption. This assumption would be supported by the absence of systematic differential prepolicy changes between schools that later

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adopted bans and those that did not. To examine this, we estimated (1) a prepolicy comparison between 2016 and 2018 and (2) the main postpolicy contrast between 2018 and 2023. For continuous outcomes, estimates are reported as unstandardized mean differences with 95% CIs. For binary outcomes, models were estimated on the log-odds scale, with odds ratios and 95% CIs presented for interpretation.

In the main analyses, we compared all schools with and without a phone ban. In sensitivity analyses, we incorporated the year of ban implementation to examine whether associations differed according to how long the ban had been in place. Most schools implemented bans between 2019 and 2023, resulting in limited long-term follow-up for early adopters. Duration analyses were therefore limited to 3 years. Additionally, we ran sensitivity analyses restricted to schools in which phones needed to be stored at home, in lockers, or in schoolbags, excluding schools in which students were allowed to keep phones on their person.

Item nonresponse (range, 0%-18.1%) was handled using multiple imputation by chained equations with 20 imputed datasets and 20 iterations.[24] School identifiers were neither imputed nor used as factors to avoid high-cardinality instability, and estimates were combined using Rubin rules. Additional details on missing data handling are provided in eTable 2 in Supplement 1. We applied a Bonferroni correction across the 11 outcomes assessed in the full sample and in gender-stratified analyses (girls and boys). Statistical significance was therefore defined as 2-sided $P < .002$ (.05/33).

Results

Among 23 938 adolescent observations across the 3 study years (7600 observations in 2016, 7487 in 2018, and 8851 in 2023, representing 56.8% to 61.9% of the adolescent population in Iceland), 11 746 adolescents (49.1%) were girls, 11 964 (50.0%) were boys, and 228 (0.9%) selected another gender option. The mean (SD) age was 13.98 (0.82) years. A total of 17 735 participants (74.1%) lived in 2-caregiver households, 19 051 (79.6%) reported Icelandic as the language spoken at home, and 19 522 (81.6%) resided in the capital region. **Table 1** presents participant characteristics in 2016, 2018, and 2023 according to whether schools had implemented a phone ban by 2023. Schools with data in all waves did not differ significantly from those with data in fewer waves in terms of language spoken at home (mean [SD], 22.0% [10.2%] vs 19.4% [12.3%] of students per school; $P = .15$) or household composition (24.9% [7.6%] vs 22.3% [10.9%]; $P = .09$), but they were more likely to be located in the capital region (45 of 70 [64.3%] vs 13 of 83 [15.7%] of schools; $\chi^2 = 36.1$; $P < .001$).

Schools with and without bans differed descriptively on some demographic characteristics and outcomes. In 2016, students in schools that later adopted bans reported lower mental well-being (mean [SD] scores, 24.64 [6.12] vs 25.16 [6.00]; $P < .001$ using linear regression models), while perceived peer support showed a similar median but a lower-shifted distribution (median [IQR] scores, 16 [14-19] vs 16 [14-19]; Mann-Whitney $P = .046$). In 2023, students in schools with bans reported depressive symptoms with a similar median but a higher upper range (median [IQR], 17 [12-24] vs 17 [12-23]; Mann-Whitney $P = .005$), lower mental well-being (mean [SD] scores, 22.47 [6.08] vs 23.12 [6.15]; $P < .001$), and lower perceived peer support (median [IQR] scores, 15 [13-18] vs 15 [14-19]; Mann-Whitney $P = .003$). These were unadjusted cross-sectional comparisons. The DiD models adjusted for grade, household composition, language spoken at home, and school fixed effects accounted for stable between-school differences. Correlations among mental health, screen use, and bullying outcomes were generally stable across survey waves (eFigure 3 in Supplement 1).

In the prepolicy period (2016-2018), some differential trends were observed between schools that later implemented a phone ban and those that did not (**Table 2**). In the full sample, students in schools with future bans showed smaller increases in time spent gaming alone (β, −0.28 [95% CI, −0.44 to −0.11]; $P = .001$). Among girls, schools with future bans showed smaller increases in depressive symptoms (β, −2.50 [95% CI, −3.27 to −1.73]; $P < .001$) and larger improvements in mental well-being (β, 1.50 [95% CI, 0.96-2.04]; $P < .001$) than comparison schools. No other outcomes showed statistically significant prepolicy differences after correction for multiple testing.

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Table 1. Participant Characteristics by Phone Ban Status in 2023 for Each Year of Survey Administration

Characteristic	Survey year								
	2016 (n = 7600)			2018 (n = 7487)			2023 (n = 8851)		
	No phone ban (n = 5344)	Phone ban (n = 2256)	*P* value	No phone ban (n = 5335)	Phone ban (n = 2152)	*P* value	No phone ban (n = 6498)	Phone ban (n = 2353)	*P* value
Gender, No. (%)									
Boys	2696 (50.4)	1105 (49.0)	.06	2657 (49.8)	1072 (49.8)	>.99	3272 (50.4)	1162 (49.4)	.93
Girls	2648 (49.6)	1151 (51.0)		2678 (50.2)	1080 (50.2)		3065 (47.2)	1124 (47.8)	
Other	NA	NA		NA	NA		161 (2.5)	67 (2.8)	
Grade, No. (%)									
8	1781 (33.3)	758 (33.6)	.99	1898 (35.6)	728 (33.8)	.36	2293 (35.3)	758 (32.2)	<.001
9	1814 (33.9)	740 (32.8)		1759 (33.0)	722 (33.6)		2162 (33.3)	801 (34.0)	
10	1749 (32.7)	758 (33.6)		1679 (31.5)	702 (32.6)		2043 (31.4)	794 (33.7)	
Household status, No. (%)									
2-Caregiver home	3960 (74.1)	1673 (74.2)	>.99	3993 (74.8)	1617 (75.1)	>.99	4795 (73.8)	1697 (72.1)	<.001
1-Caregiver home	1384 (25.9)	583 (25.8)		1342 (25.2)	535 (24.9)		1703 (26.2)	656 (27.9)	
Language spoken at home, No. (%)									
Icelandic	4468 (83.6)	1815 (80.5)	<.001	4367 (81.9)	1713 (79.6)	<.001	5012 (77.1)	1676 (71.2)	<.001
Other than Icelandic	876 (16.4)	441 (19.5)		968 (18.1)	439 (20.4)		1486 (22.9)	677 (28.8)	
Residency, No. (%)									
Capital region	4265 (79.8)	1936 (85.8)	<.001	4200 (78.7)	1853 (86.1)	<.001	5329 (82.0)	1939 (82.4)	>.99
Outside capital region	1079 (20.2)	320 (14.2)		1135 (21.3)	299 (13.9)		1169 (18.0)	414 (17.6)	
Mental health outcome scores									
Depressive symptoms, median (IQR)[a]	14 (11-21)	15 (11-21)	.52	15 (12-21)	15 (12-21)	.77	17 (12-23)	17 (12-24)	.005
Anxiety, median (IQR)[b]	9 (7-12)	9 (7-12)	.84	9 (7-12)	9 (7-12)	.51	10 (7-13)	10 (7-13)	.19
Hostility, median (IQR)[b]	7 (6-10)	7 (6-10)	.92	7 (6-10)	7 (6-10)	.75	8 (6-11)	8 (6-11)	.03
Mental well-being, mean (SD)[c]	25.16 (6.00)	24.64 (6.12)	<.001	24.36 (5.63)	24.33 (5.71)	.82	23.12 (6.15)	22.47 (6.08)	<.001
Secondary outcomes									
Peer social support, median (IQR)[d]	16 (14-19)	16 (14-19)	.046	15 (14-18)	15 (14-18)	.52	15 (14-19)	15 (13-18)	.003
Bullying									
Part of group teasing someone, No. (%)									
No	4942 (92.5)	2074 (91.9)	.71	4878 (91.4)	1955 (90.8)	.74	5948 (91.5)	2140 (90.9)	.56
Yes	402 (7.5)	182 (8.1)		457 (8.6)	197 (9.2)		550 (8.5)	213 (9.1)	
Part of group hurting someone, No. (%)									
No	5166 (96.7)	2180 (96.6)	>.99	5148 (96.5)	2055 (95.5)	<.001	6088 (93.7)	2211 (94.0)	>.99
Yes	178 (3.3)	76 (3.4)		187 (3.5)	97 (4.5)		410 (6.3)	142 (6.0)	
Teased by group, No. (%)									
No	4738 (88.7)	1990 (88.2)	.99	4691 (87.9)	1923 (89.4)	<.001	5472 (84.2)	1956 (83.1)	<.001
Yes	606 (11.3)	266 (11.8)		644 (12.1)	229 (10.6)		1026 (15.8)	397 (16.9)	
Hurt by group, No. (%)									
No	5101 (95.5)	2135 (94.6)	<.001	5073 (95.1)	2049 (95.2)	.83	6000 (92.3)	2181 (92.7)	>.99
Yes	243 (4.5)	121 (5.4)		262 (4.9)	103 (4.8)		498 (7.7)	172 (7.3)	
Sent offensive or hurtful message, No. (%)									
No	4140 (77.5)	1704 (75.5)	<.001	4491 (84.2)	1754 (81.5)	<.001	5068 (78.0)	1782 (75.7)	<.001
Yes	1204 (22.5)	552 (24.5)		844 (15.8)	398 (18.5)		1430 (22.0)	571 (24.3)	
Received offensive or hurtful message, No. (%)									
No	3529 (66.0)	1481 (65.6)	>.99	4669 (87.5)	1828 (84.9)	<.001	4518 (69.5)	1556 (66.1)	<.001
Yes	1815 (34.0)	775 (34.4)		666 (12.5)	324 (15.1)		1980 (30.5)	797 (33.9)	
Daily screen use, median (IQR), h									
Social media	2 (0.5-3)	2 (0.5-3)	.44	2 (0.5-3)	2 (0.5-3)	.27	2 (1-3)	2 (1-3.8)	.23
Gaming with friend	0 (0-2)	0 (0-2)	.84	0.5 (0-2)	0.5 (0-2)	.94	0.5 (0-2)	0.5 (0-2)	.40
Gaming alone	0 (0-1)	0 (0-1)	.43	0 (0-0.5)	0 (0-0.5)	.02	0.5 (0-2)	0.5 (0-2)	.12
Video watching	2 (1-3)	2 (1-3)	.22	2 (1-3)	2 (1-3)	.42	1 (0.5-3)	2 (0.5-3)	.16

Abbreviation: NA, not applicable.

[a] Scores range from 10 to 40, with higher scores indicating greater symptom severity.

[b] Scores range from 5 to 25, with higher scores indicating greater symptom severity.

[c] Scores range from 7 to 35, with higher scores indicating better well-being.

[d] Scores range from 5 to 20, with higher scores indicating greater perceived support.

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Table 2. Unstandardized Difference-in-Differences Estimates of the Association Between School Mobile Phone Bans and Outcomes Before and After Policy Implementation[a]

Outcome	Prepolicy estimate (95% CI)	*P* value	Postpolicy estimate (95% CI)	*P* value
Continuous[b]				
Depressive symptoms				
All	−0.97 (−2.29 to 0.35)	.15	0.65 (0.005 to 1.30)	.05
Boys	0.31 (−1.65 to 2.27)	.75	0.56 (−0.20 to 1.32)	.15
Girls	−2.50 (−3.27 to −1.73)	<.001	0.75 (−0.26 to 1.76)	.14
Anxiety				
All	−0.07 (−0.59 to 0.45)	.80	0.21 (−0.08 to 0.50)	.16
Boys	0.21 (−0.51 to 0.93)	.57	0.36 (−0.05 to 0.76)	.09
Girls	−0.45 (−0.92 to 0.02)	.06	0.03 (−0.37 to 0.44)	.87
Hostility				
All	0.13 (−0.25 to 0.51)	.50	0.23 (−0.12 to 0.59)	.20
Boys	0.53 (−0.04 to 1.10)	.07	0.35 (−0.13 to 0.83)	.15
Girls	−0.40 (−0.80 to −0.01)	.05	0.16 (−0.23 to 0.55)	.41
Mental well-being				
All	0.55 (−0.19 to 1.29)	.15	−0.52 (−1.08 to 0.03)	.06
Boys	−0.23 (−1.75 to 1.28)	.76	−0.39 (−1.10 to 0.31)	.27
Girls	1.50 (0.96 to 2.04)	<.001	−0.74 (−1.44 to −0.05)	.04
Peer support				
All	0.11 (−0.10 to 0.33)	.30	−0.13 (−0.43 to 0.17)	.40
Boys	−0.26 (−0.94 to 0.42)	.45	−0.22 (−0.65 to 0.21)	.32
Girls	0.56 (0.05 to 1.07)	.03	−0.09 (−0.44 to 0.27)	.63
Social media use				
All	0.15 (−0.02 to 0.32)	.07	0.10 (−0.08 to 0.28)	.26
Boys	0.37 (0.08 to 0.66)	.01	0.14 (−0.09 to 0.37)	.24
Girls	−0.12 (−0.45 to 0.21)	.48	0.09 (−0.12 to 0.30)	.39
Gaming with friend				
All	−0.14 (−0.40 to 0.12)	.29	0.08 (−0.14 to 0.30)	.50
Boys	−0.05 (−0.52 to 0.42)	.83	0.06 (−0.19 to 0.30)	.65
Girls	−0.23 (−0.68 to 0.22)	.32	0.10 (−0.18 to 0.38)	.48
Gaming alone				
All	−0.28 (−0.44 to −0.11)	<.001	0.16 (−0.07 to 0.39)	.17
Boys	−0.27 (−0.61 to 0.07)	.11	0.15 (−0.11 to 0.42)	.26
Girls	−0.20 (−0.64 to 0.23)	.36	0.18 (−0.11 to 0.47)	.22
Video watching				
All	−0.19 (−0.40 to 0.02)	.07	0.07 (−0.13 to 0.28)	.49
Boys	−0.05 (−0.51 to 0.41)	.83	0.10 (−0.13 to 0.33)	.39
Girls	−0.31 (−0.87 to 0.25)	.28	0.01 (−0.26 to 0.28)	.93
Binary[c]				
Received offensive or hurtful message				
All	1.42 (1.10 to 1.83)	.01	0.93 (0.74 to 1.16)	.51
Boys	1.74 (1.23 to 2.46)	.002	1.06 (0.81 to 1.40)	.65
Girls	1.18 (0.77 to 1.81)	.44	0.80 (0.56 to 1.15)	.23
Sent offensive or hurtful message				
All	1.16 (0.82 to 1.65)	.40	0.92 (0.73 to 1.15)	.46
Boys	1.39 (1.06 to 1.83)	.02	0.86 (0.64 to 1.14)	.29
Girls	0.91 (0.43 to 1.94)	.80	0.98 (0.71 to 1.35)	.90
Teased by group				
All	1.35 (1.00 to 1.83)	.05	1.28 (0.94 to 1.75)	.11
Boys	1.40 (0.88 to 2.22)	.15	1.33 (0.90 to 1.97)	.15
Girls	1.32 (0.78 to 2.23)	.30	1.26 (0.81 to 1.96)	.30

(continued)

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Table 2. Unstandardized Difference-in-Differences Estimates of the Association Between School Mobile Phone Bans and Outcomes Before and After Policy Implementation[a] (continued)

Outcome	Prepolicy estimate (95% CI)	*P* value	Postpolicy estimate (95% CI)	*P* value
Hurt by group				
All	1.04 (0.69 to 1.59)	.84	0.93 (0.54 to 1.60)	.80
Boys	1.54 (0.99 to 2.38)	.05	0.91 (0.43 to 1.89)	.79
Girls	0.44 (0.12 to 1.57)	.20	1.22 (0.58 to 2.56)	.60
Part of group teasing someone				
All	1.36 (0.77 to 2.40)	.29	0.97 (0.69 to 1.35)	.86
Boys	1.28 (0.59 to 2.77)	.53	1.00 (0.68 to 1.47)	.99
Girls	1.55 (1.06 to 2.28)	.03	0.94 (0.62 to 1.42)	.78
Part of group hurting someone				
All	1.82 (0.99 to 3.36)	.06	0.60 (0.30 to 1.20)	.14
Boys	1.72 (0.68 to 4.36)	.25	0.63 (0.31 to 1.27)	.19
Girls	1.95 (0.69 to 5.56)	.21	0.64 (0.27 to 1.54)	.32

[a] Estimates are difference-in-differences coefficients comparing schools with and without a mobile phone ban. Prepolicy estimates compare 2016 with 2018 and postpolicy estimates compare 2018 with 2023. All models include school and year fixed effects and are adjusted for grade, language spoken at home, and household composition. Standard errors were clustered at the school level.

[b] Estimates are presented as β coefficients.

[c] Estimates are presented as log odds ratios.

Although there was no consistent pattern of prepolicy divergence across outcomes, differential prepolicy trends were observed for several outcomes, which warrant cautious interpretation of the postpolicy estimates.

In the postpolicy period (2018-2023), school phone bans were not associated with meaningful changes in mental health, mental well-being, perceived peer support, screen use, or bullying outcomes (**Figure 2** and Table 2). In the full sample, the estimated postpolicy association was 0.65 (95% CI, 0.01-1.30; *P* = .05) for depressive symptoms, 0.21 (95% CI, −0.08 to 0.50; *P* = .16) for anxiety, 0.23 (95% CI, −0.12 to 0.59) for hostility, and −0.52 (95% CI, −1.08 to 0.03; *P* = .06) for mental well-being. Although a small number of estimates were suggestive of worse outcomes before multiple testing correction, none remained statistically significant after prespecified correction. Results were similarly null in gender-stratified analyses.

Sensitivity analyses examining outcome trajectories relative to the timing of phone ban implementation were consistent with the main analyses (eTable 3 in Supplement 1). Event-time estimates did not show systematic prepolicy divergence or sustained postpolicy changes across outcomes (eTable 3 and eFigure 4 in Supplement 1). A small number of isolated coefficients reached nominal statistical significance at specific time points, but these were not consistent across adjacent periods, and the 95% CIs widened at longer durations since implementation, reflecting reduced precision.

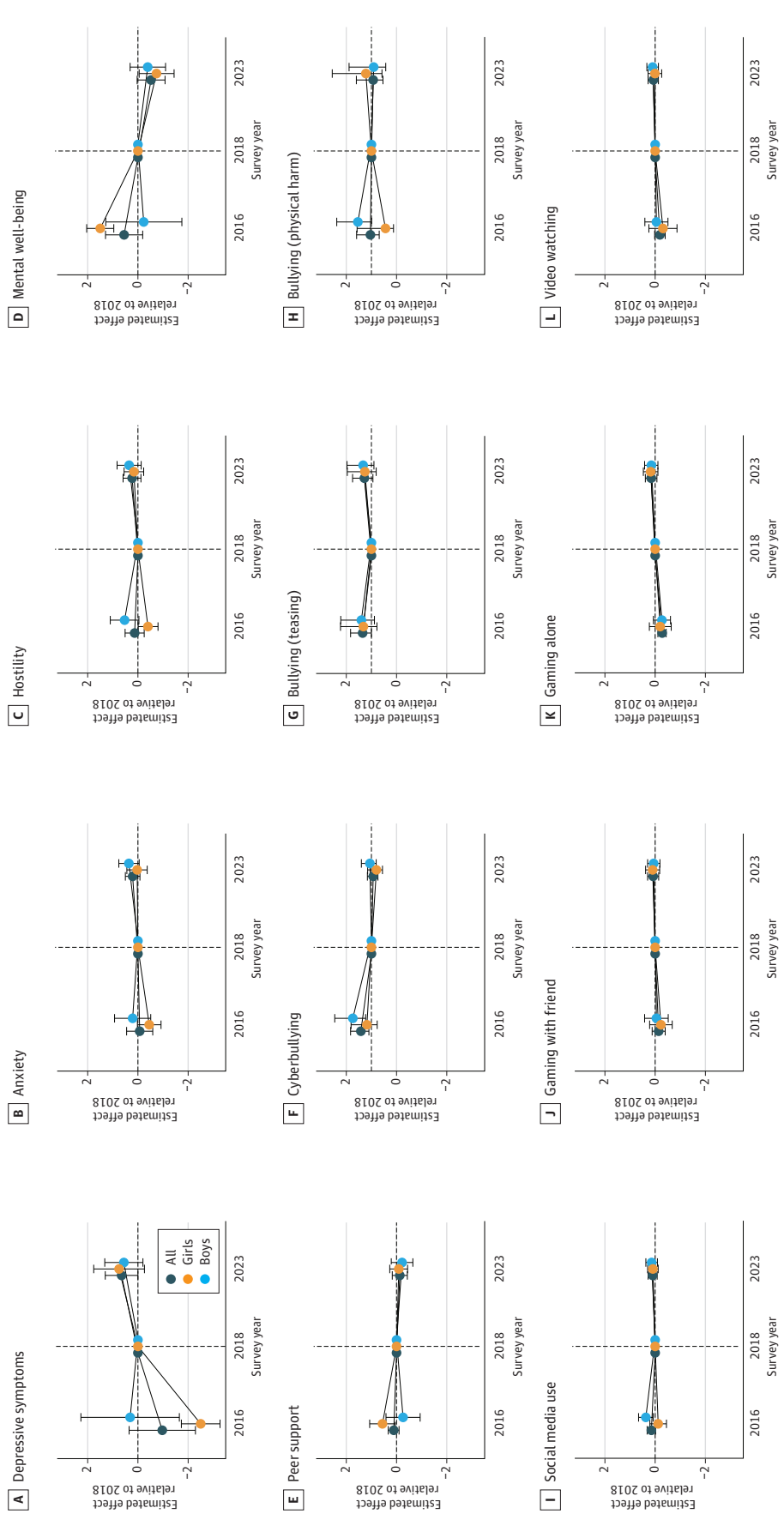
Analyses using a more stringent definition of school phone bans (ie, requiring phones to be stored away and not carried on the student's person) also yielded findings consistent with the main results (eTable 4 in Supplement 1). Across the full sample and gender-stratified analyses, there was no evidence of differential changes in mental health, perceived peer support, screen use, or bullying outcomes between schools with and without stringent restrictions. For example, in the full sample, postpolicy estimates were 0.57 (95% CI, −0.15 to 1.28) for depressive symptoms and 0.22 (95% CI, −0.14 to 0.58) for anxiety, with similarly small and imprecise estimates across other outcomes.

Discussion

With school phone restrictions gaining popularity worldwide, this repeated cross-sectional population-based study of Icelandic adolescents using DiD analyses adds to the much-needed information on their potential effect on adolescent mental health. We found that schoolwide phone bans were not associated with meaningful changes in mental health or related social and behavioral outcomes. Findings were broadly consistent across the full sample, gender-stratified analyses, sensitivity analyses examining time since implementation, and analyses using a more stringent definition of phone bans.

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Figure 2. Line Graphs of Difference-in-Differences Estimates of Mental Health Changes Associated With School Phone Bans



Estimates compare changes in outcomes between schools with and without a smartphone ban and are pooled across imputed datasets. Estimates compare the prepolicy period (2016-2018) and post-policy period (2018-2023). For continuous outcomes (mental health, perceived peer support, and screen use), estimates are expressed as unstandardized coefficients; for binary outcomes (bullying), estimates are expressed as odds ratios. Error bars represent 95% CIs based on standard errors clustered at the school level. Models include school and survey year fixed effects and are adjusted for school grade, language spoken at home, and household composition. Positive values indicate higher levels of the outcome in schools with a mobile phone ban relative to schools without a ban.

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Prior large-scale studies have yielded mixed results regarding the association between school phone bans and adolescent mental health.[16-19] Studies relying on population-based self-reported symptoms and well-being have generally found small or null associations,[16,17] whereas studies using other outcomes or policy contexts have reported more favorable findings.[18,19] One proposed mechanism is that restricting phones during the school day may improve the school social environment by reducing digital distraction and creating more opportunities for face-to-face interaction, peer engagement, and school connectedness. However, perceived peer social support was unchanged in our study, providing little evidence that phone bans meaningfully altered this aspect of the school social environment. Another possible pathway is reduced phone exposure during school. We found no change in self-reported screen use, although we assessed typical daily use rather than in-school use and did not have device-level data. However, phone use in many schools was already restricted during classroom instruction, potentially limiting the additional reduction produced by a formal ban. Together, the absence of changes in both perceived peer support and the lack of evidence for reductions in overall self-reported screen use may help explain why we did not observe population-level improvements in mental health.

We also found no evidence of meaningful differences in the experience of cyberbullying or in-person bullying in schools with and without phone bans. This is likely due to online and offline bullying being closely intertwined and often involving the same individuals,[25,26] and altering the broader relational and social processes underlying peer aggression likely requires more than limiting device access during school hours. Prior studies on phone bans and bullying have produced mixed findings, with some reporting no association, some modest reductions, and others potential increases.[13] This variability highlights that the effects of phone bans on peer relations may be context dependent and influenced by other factors, such as implementation, enforcement, school climate, and broader social dynamics.[27] This heterogeneity suggests that ongoing monitoring of in-person bullying and cyberbullying is warranted when such policies are introduced to identify unintended consequences and ensure that supportive measures are in place.

Overall, these findings suggest that school phone bans implemented alone may be insufficient to meaningfully improve adolescent mental health or related social and behavioral outcomes at the population level. However, the absence of changes in these outcomes does not preclude benefits for more proximal classroom-level outcomes, such as student attention, classroom engagement, instructional time, teacher workload, or classroom climate, which were not assessed in this study. Although such policies may be attractive because they are visible and relatively simple to implement and may offer small economic benefits,[28] adolescent mental health and bullying are multifactorial phenomena and unlikely to be substantially shifted by a single school rule in isolation. If schools choose to restrict phone use, such policies may be more effective when embedded within broader strategies, including evidence-based antibullying programs, digital citizenship education, supports for healthy peer interaction, and attention to implementation quality and student needs.[28-31]

Strengths and Limitations

This study has several strengths and limitations. A key strength is the prepolicy and postpolicy comparison within a population-based, repeated cross-sectional design. The use of adolescent self-report is both a strength and potential limitation. Self-reports provide valuable information on mental health and experiences not captured in administrative or clinical records[32] but do not allow inference about clinical levels of disorder, and self-reported screen use is only weakly correlated with objectively measured use.[33] Similarly, mental health symptoms were assessed during the preceding week, which may have limited sensitivity to longer-term changes, although a short recall period may reduce retrospective recall demands and is commonly used in validated pediatric measures.[34]

Phone ban adoption was not random, and we did not systematically assess the schools' reasons for implementing these policies. Schools that later adopted bans differed from comparison schools on some baseline characteristics and outcomes, although school fixed effects account for stable between-school differences and models adjusted for grade, household composition, and language

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spoken at home. However, some differential prepolicy trends were also observed, including for depressive symptoms and mental well-being among girls and respondents who reported gaming alone in the full sample. Although there was no consistent pattern of prepolicy divergence across outcomes, these differential trends warrant cautious interpretation of postpolicy estimates. Unmeasured time-varying differences between adopting and nonadopting schools may also remain, including differential effects of broader changes in adolescent mental health and digital-media use associated with the COVID-19 pandemic. Timing-based sensitivity analyses also produced imprecise estimates with wide 95% CIs at longer leads and lags, reflecting limited statistical power to detect small or delayed associations. Although phone ban status was based on formal school policies and direct confirmation from schools, we did not directly assess implementation fidelity, enforcement, or student compliance, which may have varied across schools and over time. We also lacked objective measures of in-school smartphone use and therefore could not determine whether bans reduced actual phone use. Finally, analyses were restricted to schools participating in all 3 waves, and the sample was not fully nationally representative by geographic residency. However, included and excluded schools were similar on observed sociodemographic characteristics, and the sample comprised approximately 60% of the national population and was broadly representative by age and gender.

Conclusions

In this population-based, repeated cross-sectional study using DiD analyses, schoolwide phone bans were not associated with meaningful improvements in adolescent mental health, perceived peer support, screen use, or bullying. Together with other recent evidence, our findings suggested that phone bans alone may be insufficient to produce population-level improvements in adolescent well-being. Future research should examine whether more integrated, context-sensitive approaches to digital media use in schools are more effective.

ARTICLE INFORMATION

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REFERENCES

1. How's life for children in the digital age? Organisation for Economic Co-operation and Development. May 15, 2025. Accessed September 23, 2025. https://www.oecd.org/en/publications/how-s-life-for-children-in-the-digital-age_0854b900-en.html

2. Singh B, Zhou M, Curtis R, Maher C, Dumuid D. Social media use and well-being across adolescent development. *JAMA Pediatr*. 2026;180(3):288-297. doi:10.1001/jamapediatrics.2025.5619

3. Maheux AJ, Burnell K, Maza MT, Fox KA, Telzer EH, Prinstein MJ. Annual research review: adolescent social media use is not a monolith: toward the study of specific social media components and individual differences. *J Child Psychol Psychiatry*. 2025;66(4):440-459. doi:10.1111/jcpp.14085

4. McGorry PD, Mei C, Dalal N, et al. The Lancet Psychiatry Commission on youth mental health. *Lancet Psychiatry*. 2024;11(9):731-774. doi:10.1016/S2215-0366(24)00163-9

5. Haskell E, Sigmarsdottir B, Thorisdottir IE, et al. Adolescent mental health before, during, and after the COVID-19 pandemic in Iceland: a repeated, cross-sectional, population-based study. *Lancet Reg Health Eur*. 2025; 53:101301. doi:10.1016/j.lanepe.2025.101301

6. Thorisdottir IE, Asgeirsdottir BB, Sigurvinsdottir R, Allegrante JP, Sigfusdottir ID. The increase in symptoms of anxiety and depressed mood among Icelandic adolescents: time trend between 2006 and 2016. *Eur J Public Health*. 2017;27(5):856-861. doi:10.1093/eurpub/ckx111

7. Teague S, Somoray K, Shatte A, et al. Digital media use and child health and development: a systematic review and meta-analysis. *JAMA Pediatr*. 2026;180(5):510-517. doi:10.1001/jamapediatrics.2026.0085

8. Sanders T, Noetel M, Parker P, et al. An umbrella review of the benefits and risks associated with youths' interactions with electronic screens. *Nat Hum Behav*. 2024;8(1):82-99. doi:10.1038/s41562-023-01712-8

9. Fassi L, Thomas K, Parry DA, Leyland-Craggs A, Ford TJ, Orben A. Social media use and internalizing symptoms in clinical and community adolescent samples: a systematic review and meta-analysis. *JAMA Pediatr*. 2024;178(8): 814-822. doi:10.1001/jamapediatrics.2024.2078

10. Nagata JM, Kim KE, Huang OH, et al. Smartphone use during school hours by US youth in the Adolescent Brain Cognitive Development Study. *JAMA*. 2026;335(5):453-456. doi:10.1001/jama.2025.23235

11. Telzer EH, Burnell K. Smartphone use during school hours and association with cognitive control in youths aged 11 to 18 years. *JAMA Netw Open*. 2026;9(3):e261092. doi:10.1001/jamanetworkopen.2026.1092

12. To ban or not to ban? monitoring countries' regulations on smartphone use in school. UNESCO. Updated January 24, 2025. Accessed November 24, 2025. https://www.unesco.org/en/articles/smartphones-school-only-when-they-clearly-support-learning

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13. Campbell M, Edwards EJ, Pennell D, et al. Evidence for and against banning mobile phones in schools: a scoping review. *J Psychol Couns Sch*. 2024;34(3):242-265. doi:10.1177/20556365241270394

14. Weiss HA, Bonell C. Smartphone use and mental health: going beyond school restriction policies. *Lancet Reg Health Eur*. 2025;51:101237. doi:10.1016/j.lanepe.2025.101237

15. Amez S, Baert S. Smartphone use and academic performance: a literature review. *Int J Educ Res*. 2020;103:101618. doi:10.1016/j.ijer.2020.101618

16. Goodyear VA, Randhawa A, Adab P, et al. School phone policies and their association with mental wellbeing, phone use, and social media use (SMART Schools): a cross-sectional observational study. *Lancet Reg Health Eur*. 2025;51:101211. doi:10.1016/j.lanepe.2025.101211

17. Baggio S, Wade T, Radunz M, et al. Psychological consequences of school mobile phone bans: Emulated trial of a natural experiment in South Australia. *Comput Hum Behav*. 2025;172:108767. doi:10.1016/j.chb.2025.108767

18. Abrahamsson S. Smartphone bans, student outcomes and mental health. *J Hum Resour*. Published online March 11, 2026. doi:10.3368/jhr.0224-13403R2

19. Allcott H, Baron EJ, Dee T, Duckworth AL, Gentzkow M, Jacob B. *The Effects of School Phone Bans: National Evidence from Lockable Pouches*. National Bureau of Economic Research; 2026. doi:10.3386/w35132

20. Derogatis LR, Unger R. Symptom Checklist-90–Revised. In: Weiner IB, Craighead WE, eds. *The Corsini Encyclopedia of Psychology*. John Wiley & Sons; 2010:1-2. doi:10.1002/9780470479216.corpsy0970

21. Stewart-Brown S, Tennant A, Tennant R, Platt S, Parkinson J, Weich S. Internal construct validity of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS): a Rasch analysis using data from the Scottish Health Education Population Survey. *Health Qual Life Outcomes*. 2009;7(1):15. doi:10.1186/1477-7525-7-15

22. Thorlindsson T, Bjarnason T. Modeling Durkheim on the micro level: a study of youth suicidality. *Am Sociol Rev*. 1998;63(1):94-110. doi:10.2307/2657479

23. Rothbard S, Etheridge JC, Murray EJ. A tutorial on applying the difference-in-differences method to health data. *Curr Epidemiol Rep*. 2024;11(2):85-95. doi:10.1007/s40471-023-00327-x

24. Van Buuren S, Groothuis-Oudshoorn K. mice: Multivariate imputation by chained equations in R. *J Stat Softw*. 2011;45:1-67. doi:10.18637/jss.v045.i03

25. Li C, Wang P, Martin-Moratinos M, Bella-Fernández M, Blasco-Fontecilla H. Traditional bullying and cyberbullying in the digital age and its associated mental health problems in children and adolescents: a meta-analysis. *Eur Child Adolesc Psychiatry*. 2024;33(9):2895-2909. doi:10.1007/s00787-022-02128-x

26. Thériault-Couture F, Blangis F, Dooley N, et al. Cybervictimisation and mental health conditions in young people: findings from a nationally representative longitudinal cohort. *Lancet Child Adolesc Health*. 2026;10(2):94-102. doi:10.1016/S2352-4642(25)00311-6

27. Figlio DN, Özek U. *The Impact of Cellphone Bans in Schools on Student Outcomes: Evidence from Florida*. National Bureau of Economic Research; 2025.

28. Perry SJ, Goodyear VA, Pallan M, et al. Health economics analysis of restrictive school smartphone policies in secondary schools in England (SMART Schools). *BMJ Ment Health*. 2026;29(1):e301892. doi:10.1136/bmjment-2025-301892

29. Goodyear VA, James C, Orben A, Quennerstedt M, Schwartz G, Pallan M. Approaches to children's smartphone and social media use must go beyond bans. *BMJ*. 2025;388:e082569. doi:10.1136/bmj-2024-082569

30. Skeggs A, Orben A. Social media interventions to improve well-being. *Nat Hum Behav*. 2025;9(6):1079-1089. doi:10.1038/s41562-025-02167-9

31. Goodyear VA, Randhawa A, Adab P, et al. How school phone policies influence adolescent phone use and wellbeing (SMART Schools): a qualitative comparative case study. *Soc Sci Med*. 2026;398:119094. doi:10.1016/j.socscimed.2026.119094

32. Dykxhoorn J, Solmi F, Walters K, et al. Common mental disorders in young adults: temporal trends in primary care episodes and self-reported symptoms. *BMJ Ment Health*. 2025;28(1):e301457. doi:10.1136/bmjment-2024-301457

33. Parry DA, Davidson BI, Sewall CJR, Fisher JT, Mieczkowski H, Quintana DS. A systematic review and meta-analysis of discrepancies between logged and self-reported digital media use. *Nat Hum Behav*. 2021;5(11):1535-1547. doi:10.1038/s41562-021-01117-5

34. Coombes L, Bristowe K, Ellis-Smith C, et al. Enhancing validity, reliability and participation in self-reported health outcome measurement for children and young people: a systematic review of recall period, response scale format, and administration modality. *Qual Life Res*. 2021;30(7):1803-1832. doi:10.1007/s11136-021-02814-4

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SUPPLEMENT 1.

eMethods. Study Design and Statistical and Sensitivity Analyses

eTable 1. Details of Survey Question Phrasing and Response Options of Demographic, Mental Health, Trauma Exposure, and Screen Use Variables Used in the Study

eTable 2. Missingness for Each Variable by Year

eTable 3. Pooled Unstandardized Event-Study Estimates by Years Relative to Implementation of School Mobile Phone Bans

eTable 4. Unstandardized Difference-in-Differences Estimates of Associations Between Stringent School Phone Restrictions and Adolescent Mental Health, Well-Being, Screen Use, and Bullying Outcomes

eFigure 1. Coverage of the Icelandic Adolescent Population by the Study Sample (Counts and Percentages), by Grade and Survey Year (2016-2023)

eFigure 2. Absolute Differences Between Study Sample and National Population Distributions

eFigure 3. Pooled Pearson Correlation Matrices for Mental Health, Screen Use, and Bullying Outcomes Across Survey Waves

eFigure 4. Event-Study Estimates of the Association Between the Timing of School Phone Bans and Adolescent Outcomes

SUPPLEMENT 2.

Data Sharing Statement

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