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Is social media screen time really associated with poor adolescent mental health? A Time Use Diary Study.

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Background

There is increasing concern regarding the potential impact of social media use on the mental health of young people. Previous research has relied heavily on retrospective accounts of social media screen-time. Yet recent evidence suggests that such self-report measures are unreliable, correlating poorly with more objective measures of social media use. In principle, time use diaries provide a less biased measure of social media use.

Methods

We analysed cross-sectional data from the Millennium Cohort Study to explore associations between social media screen-time as recorded in time use diaries (TUD) and key mental health outcomes – self-harm in the past year, depressive symptoms (Short Mood and Feelings Questionnaire), self-esteem (shortened Rosenberg scale) – in adolescence. Social media TUD data were available for 4,032 participants (25.4% aged 13; 73.5% aged 14; 1.1% aged 15).

Results

Following adjustment for confounders, a greater amount of time spent on social media was associated with an increased risk of self-harm (adjusted OR per 30-minute increase in weekday use: 1.13, 95% CI 1.06 to 1.21) and depression (adjusted OR=1.12, 95%CI 1.07 to 1.17) and lower levels of self-esteem (adjusted B = -0.12, 95%CI -0.20 to -0.04) in females. Findings were similar for weekday and weekend use.

Limitations

The cross-sectional nature of the data limits inference in relation to the causal direction of these associations.

Conclusions

Future research should examine the direction of the associations with self-harm and other mental health outcomes and explore how adolescents engage with social media as well as how much time they spend online.

Keywords: Social media; Adolescence; Self-harm; Depression; Self-esteem; Millennium Cohort Study

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Introduction

Social media is a relatively new phenomenon, though today's adolescents have grown up in a world in which it has always been present. Social media use amongst adolescents has risen rapidly over the last 16 years since the launch of Facebook; according to Ofcom (2019) just under 70% of 12-15 year-olds in the UK have a social media profile, with over a third agreeing that they found it difficult to control their screen-time (Ofcom, 2019). Over the same period of time, rates of suicide, non-suicidal self-harm and common mental disorder among young people in the UK have increased, particularly among females (McManus et al, 2019; Morgan et al, 2017). Given the ramifications of poor mental health in adolescence, in terms of academic attainment, employment and mental health in adulthood (Lopez-Lopez et al, 2020), it is vital that we enhance understanding about the potential relationship between social media use and adolescent mental health.

Findings from several studies suggest that social media use may be associated with poorer mental health in adolescents. With poor mental health becoming increasingly prevalent among female adolescents in particular, the question has been raised as to whether social media – used more intensively by females – may be an important contributor to this gender difference (Gunnell et al, 2018). Using cross-sectional questionnaire data derived from the Millennium Cohort Study, Kelly et al (2018) found that time spent on social media at age 14 was associated with depressive symptoms, with a stronger association in females than males. Using Specification Curve Analysis of cross-sectional data from the Millennium Cohort Study and Monitoring The Future, Orben and Przybylski (2019a) also found a negative association between social media use and adolescent well-being, although the effect size was small. Prior studies of the impact of social media on mental health have largely focused on depression, anxiety and cognitive or affective wellbeing. To date, little research exists examining an association between social media screen-time and risk of self-harm (George, 2019). Self-harm not only has immediate physical consequences but is associated with increased risk of suicide (Muehlenkamp & Guttierrez, 2007). Levels of self-harm have risen substantially over recent years, particularly among 13-16 year-old girls (Morgan et al, 2017), making the lack of evidence about associations with social media use a key knowledge gap.

Previous research has been limited by retrospective self-report estimates of time spent using social media on a 'typical' week-day, with evidence indicating only moderate correlations with objective measures such as apps or log files (Andrews at al, 2015) or 'aggregated in-situ measures such as experience sampling' (Naab et al 2019). In the absence of accessibility of data from social media companies themselves, usage data from apps likely represents the most reliable measure of social media screen-time, but installation of apps is difficult to implement in large representative samples and log files are difficult to amalgamate for all devices (Scharkow 2016). Time use diaries (TUD), using methodology akin to experience sampling, may be a good compromise, whereby respondents are asked to record their social media use (amongst other activities) in small units of time over a specific day (Orben and Przybylski 2019b). TUD are subject to less recall bias, are more specific rather than considering a 'typical' day, and likely introduce less response bias than questionnaire measures which impose more limiting response categories on the respondent (Naab et al 2019).

The current study extends previous research by using TUD to assess social media use in a large-scale representative sample of UK adolescents. We investigated associations between time spent on social media and self-harm, as well as depressive symptoms and self-esteem, taking account of prior mental health problems. We hypothesise that social media screen-time reported in TUD will be negatively associated with mental health, based on previous research demonstrating this with retrospective self-report measures of screen-time. Consistent with previous findings, we also expect these associations to be more compelling in females than males.

Method

We utilised cross-sectional data from the sixth sweep (2015) of the nationally representative birth cohort Millennium Cohort Study (MCS), when respondents were aged 13-15 years. At this sweep interview data are available for 11,884 individual cohort members, with measures including mental health and well-being and demographic information. The sample comprised 2,864 13-year-olds, 8,860 14-year-olds and 160 15-year-olds (50% female). In this sweep, 10,337 cohort members were also invited to complete time use diaries (TUD) recording activities from a pre-defined list, performed during two 24-hour periods; a randomly selected weekday and a weekend day. Diaries were recorded on paper, online or via an app. The smallest unit of activity time depended on the modality of collection; 1-minute units via the app and 10-minute units online or on paper. Data were then recoded into 30-minute units for analysis and treated as a continuous variable. 4,642 participants completed and returned time use diaries (TUD) (26% aged 13, 73% aged 14, 1% aged 15; 55% female). Social media data was available for 4,032 participants (3,800 on a weekday and 3,814 on a weekend day). Further information on the MCS is available from the Centre for Longitudinal Studies (http://www.cls.ioe.ac.uk/mcs). Cohort members who completed the time use diary data and had data on social media use were significantly younger and more likely to be female, White and from a higher income household (see table 1).

Measures

Social media use Time use diaries (TUD) were used to record time spent on social media. Social media use was assessed via the activity 'browsing and updating on social networking sites, e.g. Twitter, Facebook, BBM, Snapchat'. Associations were explored separately for weekday and weekend use.

Outcome measures

1) Self-harm: Participants responded yes or no to the question 'In the past year have you hurt yourself on purpose in any way?'.

2) Depressive symptoms: Assessed using the Short Mood and Feelings questionnaire (SMFQ, Angold et al, 1995). The SMFQ includes 13 negatively worded questions - such as 'I cried a lot' and 'I felt lonely' - about the past two weeks with responses given on a three-point scale from 0 (not true); 1 (somewhat true); 2 (true). Summed scores ranged from 0 to 26, with higher scores indicating increased depressive symptoms. For sensitivity analysis, a binary variable was also created with a cut-off point of 11 or more suggested by previous research as indicative of high risk of depression (McKenzie et al 2011).

*3) Self-esteem: A*ssessed using the 5-item shortened Rosenberg scale measuring self-satisfaction (Rosenberg, 1989). Respondents were asked to indicate agreement or disagreement with five positively worded statements (for example 'on the whole, I feel satisfied with myself' and 'I feel good about myself'). Response options were Strongly agree, Agree, Disagree and Strongly disagree. To facilitate interpretation the variables were recoded so that higher scores indicate greater self-esteem, with summed scores ranging from 0 to 15.

Confounders

We adjusted for several potential confounding variables based on a-priori grounds and previously published literature on self-harm, including age, ethnicity, socioeconomic status (equivalised income quintiles) and parent-reported internalising symptoms at age 11. Internalising symptoms at age 11 were measured using the summed 'peer relationship problems' and 'emotional symptoms' subscales of the Strengths and Difficulties Questionnaire (SDQ, Goodman, 2001).

Statistical analysis

Logistic and linear regression models were used to explore associations between time spent on social media and mental health outcomes. In line with previous research indicating the association between social media use and mental health may be stronger in females than males (e.g. Kelly et al 2018) findings are presented separately by gender. Data were weighted according to MCS guidance. All analyses were completed using STATA software version 15.

Results

Self-harm

Self-harm in the past year was reported by 14.7% of the sample (20.2% of females and 6.5% of males, see table 2). Following adjustment for confounders, a greater amount of time spent on social media on a weekday was associated with an increased risk of self-harm for females (adjusted OR per 30-minute increase in social media use = 1.13, 95%CI 1.06 to 1.21), see table 3. For weekend use, effect estimates were consistent with an increased risk of self-harm for both males and females, however there was little statistical evidence for an association (the confidence intervals include the null) (adjusted OR for females =1.04, 95%CI 0.98 to 1.10; adjusted OR for males = 1.06, 95%CI 0.97 to 1.16)

Depression

Females reported higher levels of depressive symptoms (Mean=6.78, SD =6.33) than males (Mean= 3.99, SD= 4.38, see table 2). . For females, increasing time spent on social media was associated with a greater number of depressive symptoms (see table 4). Findings remained after adjusting for confounders and were consistent for weekday and weekend use (adjusted β per 30-minute increase in social media use: weekday use = 0.36, 95%CI 0.22 to 0.50; weekend use = 0.19, 95%CI 0.06 to 0.32). There was little evidence for an association between time spent on social media and depression in males. Results were consistent in sensitivity analysis with depression included as a binary outcome (indicating high risk of depression) (supplementary table 1).

Self-esteem

Males reported higher levels of self-esteem (Mean=11.49, SD =2.54) than females (Mean= 9.92, SD= 2.88, see table 2). For females, increasing time spent on social media was associated with increased

risk of poor self-esteem (see table 5). Findings remained after adjusting for confounders and were consistent for weekday and weekend use (adjusted β per 30-minute increase in social media use: weekday use = -0.12, 95%CI -0.20 to -0.04; weekend use = -0.12, 95%CI -0.18 to -0.07). There was little evidence for an association between time spent on social media and self-esteem in males.

Discussion

In this large population-based study of adolescents, using novel time use diary data, we found that a greater amount of time spent on social media was associated with increased risk of self-harm and depression and lower levels of self-esteem in females. Findings persisted after adjustment for covariates, including prior mental health problems. This study provides important new evidence in relation to the knowledge gap around potential 'toxic' effects of screen-time, as identified by the UK Royal College of Paediatrics and Child Health (https://www.rcpch.ac.uk/resources/health-impacts-screen-time-guide-clinicians-parents). The findings here show that 30-minute increments in exposure were independently associated with a clear increase in depressive symptoms and risk of self-harm and poor self-esteem.

Our findings are consistent with previous research demonstrating negative associations between social media screen-time reported retrospectively and adolescent mental health and extends previous findings on depression (Boers et al 2019), anxiety (Woods & Scott 2016), self-esteem (Boers et al 2019; Woods & Scott, 2016) and well-being (Booker et al 2018; Orben et al 2019) to demonstrate associations between social media screen-time and increased risk of self-harm in adolescence. Gender differences demonstrated here are also consistent across the literature, with evidence of negative associations between social media screen-time and mental health generally more compelling in females than males (Booker et al 2018; Kelly et al 2018). It should be noted however, that there may have been less power to detect an association in males; females were over-represented in the TUD sample, including when survey weights were applied. Results here, as elsewhere, indicate that female adolescents report spending more time using social media and report poorer mental health than their male peers. The reasons underlying the difference in screen-time are unclear and are likely to be multifaceted. The increased risk of poor mental health in female adolescents compared to males is already well established, and a variety of contributing factors have been identified, including both biological (e.g. hormones) and environmental (e.g. sexual harassment, pressure to conform to societal expectations of body image (Gunnell et al 2018; Kelly et al 2018; Kuehner 2017). While there is some

evidence that cyberbullying, inadequate sleep and lower levels of physical activity may mediate the relationship between social media use and mental health in female adolescents, further research is needed to enhance understanding of these gender differences (Viner et al 2019).

Whilst the direction of association cannot be determined in a cross-sectional study, the results presented here are consistent with findings from previous research using longitudinal data from the panel survey Understanding Society (Booker et al 2018), whereby hours spent 'chatting or interacting with friends through a social website' on a school day at age 10 was longitudinally associated with lower happiness and poorer mental well-being in females. Further analysis of the same data indicates that the negative relationship between social media and life satisfaction is reciprocal (Orben et al 2019). However, an ecological momentary assessment study of US adolescents found little evidence of a longitudinal association between social media use and depression or worry (Jensen et al 2019). To our knowledge, there have been no prospective studies exploring the relationship between social media use and self-harm. It is possible that young people in distress or self-harming may be more likely to turn to social media for sources of comfort and support or for help-seeking information. It is also possible that viewing self-harm or suicide related imagery posted by others on social media may normalise such behaviour and thus increase the risk of self-harm (George 2019). Longitudinal studies are required to better understand this relationship. It should also be noted that while this paper focuses on direct effects, considering self-esteem as an outcome in its own right, complex associations between self-esteem, depression and self-harm are likely to exist. Future longitudinal research should consider whether the association between social media use and depression are mediated or moderated by self-esteem, as well as investigating other potential pathways.

Previous research using this cohort has demonstrated negative associations between retrospectively self-reported social media screen-time (assessed using a single-item measure) and well-being (Kelly et al 2018; Orben and Przybylski 2019a). Findings have been inconsistent however, and another study using TUD data from the same cohort found no meaningful association between wellbeing and a more broadly defined measure of 'digital engagement' (including social media use but also general internet

use, watching TV or playing electronic games) (Orben and Przybylski 2019b). In addition to including self-harm as a previously under-studied outcome, this study complements prior work by using rich time use diary data, which is considered to be a more reliable measure than previously used self-report survey items. We also focus specifically on the use of social media, distinct from other forms of screen-time. The TUD data also allowed separation into weekend and weekday social media use though few differences in mental health outcome associations were observed between the two days.

The MCS is a methodologically rigorous population-based cohort study. Use of TUD to collect information on social media screen-time is rare in such a large nationally representative sample. It has previously been suggested that the reliability of retrospective self-report in measuring screen-time may be compromised as a result of recall bias, perception of the middle response category as the 'average' use, or the cognitive burden associated with summing different online activities, across different technologies (smartphones, tablets, laptops and PCs) and deliberating what to include in the calculation (ambiguous activities could include fleeting checks of a notification, responding to a WhatsApp message, watching a video on YouTube). These calculations, completed under time pressure, may be further complicated when considering the use of social media simultaneously on multiple devices (such as responding to online messages on a smartphone while watching a video on YouTube) (Ellis, 2019). Time use diaries are an in-situ mode of data collection, whereby respondents' recall is facilitated by the specificity of the day in question, as well as the format of selecting a pre-defined activity to account for each small unit of time throughout the day. The absence of broad time-based response categories in TUD means there is no social desirability associated with a perceived 'normal' or average amount of social media screen-time.

Despite the advantages noted above, the TUD mode implemented in the MCS is not without limitations. Although respondents were encouraged to respond 'in-situ' throughout the day, it was possible to do so retrospectively, which may increase recall bias. Most importantly, the TUD did not allow for the reporting of multi-tasking. A scenario in which someone is watching television and

using social media on a smartphone simultaneously would require the participant to report only one of these activities in a given time period. It is feasible that the use of social media on smartphones could make it more likely to be perceived as a secondary activity if done while eating, travelling, at school or watching a film – and thus under-recorded in a TUD. Where an activity appeared in the list of options might also influence its likelihood of being selected (e.g. Krosnick et al 1987). In the list of activities offered to participants, sleep, personal care, school, homework, housework, looking after people or animals, eating or drinking, exercise, travelling, social and family time were all positioned above digital media, including social media, and therefore may be more likely to be prioritised when deciding between simultaneous activities (Ipsos MORI technical report, 2016). This may go some way to explaining the lower levels of screen-time reported in TUD compared to retrospective self-report in the MCS (see Orben and Przybylski, 2020 for a comparison).

The TUD category most exclusively related to social media use was 'browsing and updating on social networking sites, e.g. Twitter, Facebook, BBM, Snapchat'. However, an additional category included 'email, instant messaging and texting'. We excluded this category from our TUD analysis due to the conflation with emailing and other general mobile telephone use, but this may lead to an underestimation of social media screen-time if messaging sites such as WhatsApp were excluded. There may be some further overlap in definitions and interpretations of other activity categories offered in the TUD. Social media apps are often used to play games, listen to music and watch videos. Such complexities are likely to present challenges to respondents deciding how best to categorize these activities, potentially compromising the accuracy of any self-report measure of social media screen-time.

Without an objective measure of social media use, it is impossible to accurately assess the reliability of TUD. Further development and evaluation of ways in which to directly capture this activity is essential in improving knowledge of the relationship between screen-time and adolescent mental health. The research field would further benefit from more longitudinal studies to examine the direction of associations between screen-time and mental health, as well as examining mechanisms

underpinning the gender differences in social media screen-time, and in its relationship with mental health.

Beyond distinguishing social media use from other forms of digital engagement, there is growing consensus that future research must evolve beyond one-dimensional measures of social media screen-time (whether self-reported retrospectively or in-situ) and adopt a more nuanced examination of different social media apps and activities (Orben et al 2019; Scott & Woods 2019). Social media use is not a homogenous activity, and a simplistic estimate of 'social media' screen-time is unlikely to be the most informative variable in helping us to understand the relationship between mental health and social media use. Social media use encompasses a very wide range of activity, including passive lurking on strangers' Facebook profiles, posting highly edited selfies on Instagram, using WhatsApp to arrange a get together with friends, watching any number of videos on YouTube, reading the news on Twitter and so much more. Different activities or apps are likely to have different relationships with mental health (Verduyn et al 2017) and as social media and our use of it further evolves in complexity, so too will the impacts on mental health.

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Table 1: description of analytic sample, demographics

	Social media time use diary data available	Social media time use diary data not available	χ^2
N	4,032	7,852	
Proportion aged:			
13 years	25.4%	23.4%	$\chi^2=8.86$, $p=0.012$
14 years	73.5%	75.1%	
15 years	1.1%	1.5%	
Proportion female	55.2%	47.2%	$\chi^2=67.95$, $p=0.000$
Proportion non-White	15.4%	23.0%	$\chi^2=92.53$, $p=0.000$
Proportion lowest income quintile	10.1%	20.8%	$\chi^2=214.06$, $p=0.000$
Proportion highest income quintile	29.9%	18.9%	$\chi^2=185.57$, $p=0.000$

Unweighted estimates

Table 2: description of analytic sample, social media screen-time and mental health outcomes by gender

	Females %/mean (95% CI)	Males %/mean (95% CI)	Overall %/mean (95% CI)
N	2,225	1,807	4,032
Social media screen-time, weekday			
<30 minutes	65.1% (62.9% to 67.2%)	81.9% (79.9% to 83.7%)	72.7% (71.2% to 74.2%)
30-60 minutes	13.6% (12.2% to 15.3%)	7.4% (6.2% to 8.8%)	10.8% (9.8% to 11.9%)
60-90 minutes	9.9% (8.7% to 11.3%)	5.2% (4.2% to 6.5%)	7.8% (7.0% to 8.7%)
90-120 minutes	4.6% (3.7% to 5.6%)	2.1% (1.5% to 3.0%)	3.5% (2.9% to 4.1%)
120 minutes or more	6.8% (5.7% to 8.0%)	3.3% (2.5% to 4.3%)	5.2% (4.5% to 6.0%)
Social media screen-time, weekend day			
<30 minutes	59.3% (57.0% to 61.5%)	81.3% (79.3% to 83.2%)	69.1% (67.7% to 70.8%)
30-60 minutes	14.4% (12.9% to 16.1%)	7.7% (6.5% to 9.1%)	11.3% (10.3% to 12.5%)
60-90 minutes	11.9% (10.5% to 13.4%)	6.2% (5.1% to 7.5%)	9.3% (8.4% to 10.3%)
90-120 minutes	4.9% (4.0% to 6.0%)	2.0% (1.4% to 2.8%)	3.6% (3.0% to 4.3%)
120 minutes or more	9.5% (8.3% to 10.9%)	2.8% (2.1% to 3.7%)	6.4% (5.7% to 7.3%)
Proportion self-harmed in past year	20.2% (18.6% to 21.9%)	6.5% (9.2% to 9.5%)	14.1% (13.0% to 15.2%)
Mean depression score	6.78; SD=6.33 (CI: 6.52 to 7.05)	3.99; SD=4.38 (CI: 3.79 to 4.19)	5.54; SD=5.71 (CI: 5.36 to 5.71)

| Mean self-esteem score | 9.92; SD=2.88 (CI: 9.80 to 10.04) | 11.49; SD=2.54 (11.37 to 11.61) | 10.62; SD=2.84 (10.53 to 10.71) |

Unweighted estimates

Table 3: Multivariable regressions, odds ratios for self-harm by social media use weekday and weekend day

	Females			Males		
	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Weekday social media use Males (n=1461); Females (n=1812)	1.14 (1.07 to 1.22)	1.14 (1.07 to 1.22)	1.13 (1.06 to 1.21)	0.88 (0.76 to 1.03)	0.91 (0.79 to 1.05)	0.92 (0.79 to 1.06)
Weekend social media use Males (n=1453); Females (n=1814)	1.06 (1.00 to 1.12)	1.05 (0.99 to 1.12)	1.04 (0.98 to 1.10)	1.04 (0.95 to 1.15)	1.05 (0.96 to 1.16)	1.06 (0.97 to 1.16)

Results are weighted estimates

Table 4 Multivariable regressions, coefficients for depression symptoms by social media use weekday and weekend day

	Females			Males		
	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)
Weekday social media use Males (n=1458); Females (n=1810)	0.43 (0.28 to 0.57)	0.39 (0.24 to 0.54)	0.36 (0.22 to 0.50)	0.10 (-0.11 to 0.31)	0.08 (-0.12 to 0.28)	0.10 (-0.10 to 0.30)
Weekend social media use Males (n=1450); Females (n=1814)	0.25 (0.13 to 0.37)	0.22 (0.09 to 0.35)	0.19 (0.06 to 0.32)	-0.01 (-0.22 to 0.21)	-0.02 (-0.24 to 0.20)	-0.01 (-0.23 to 0.20)

Results are weighted estimates.

Table 5 Multivariable regressions, coefficients for self-esteem scores by social media use weekday and weekend day

	Females			Males		
	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)
Weekday social media use Males (n=1447); Females (n=1797)	-0.14 (-0.21 to -0.06)	-0.13 (-0.20 to -0.06)	-0.12 (-0.20 to -0.04)	-0.00 (-0.16 to 0.15)	0.01 (-0.14 to 0.16)	0.00 (-0.15 to 0.15)
Weekend social media use Males (n=1443); Females (n=1802)	-0.14 (-0.20 to -0.09)	-0.13 (-0.19 to -0.08)	-0.12 (-0.18 to -0.07)	0.05 (-0.05 to 0.15)	0.05 (-0.05 to 0.16)	0.05 (-0.05 to 0.15)

Results are weighted estimates

Supplementary table 1: Multivariable regressions, odds ratios for depression by social media use weekday and weekend day

	Females			Males		
	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms	Unadjusted	Adjusted for age, income and ethnicity	Additionally adjusted for previous internalising symptoms
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Weekday social media use Males (n=1458); Females (n=1810)	1.13 (1.08 to 1.19)	1.12 (1.07 to 1.18)	1.12 (1.07 to 1.17)	1.04 (0.91 to 1.19)	1.04 (0.92 to 1.19)	1.05 (0.92 to 1.20)
Weekend social media use Males (n=1450); Females (n=1814)	1.09 (1.04 to 1.14)	1.08 (1.03 to 1.13)	1.08 (1.03 to 1.13)	1.05 (0.93 to 1.18)	1.05 (0.93 to 1.18)	1.05 (0.93 to 1.19)

Results are weighted estimates; Depression defined as SMFQ score of 11 or more.