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# Mental Health and Problematic Social Media Use in Canadian Adolescents

Findings from the 2018  
Health Behaviour of School-aged Children (HBSC) Study



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Mental health of Canadian adolescents

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Problematic social media use

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Association between mental health and problematic social media use

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Predicted probabilities of mental health outcomes by problematic social media use

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*Mental Health and Problematic Social Media Use in Canadian Adolescents  
Findings from the 2018 Health Behaviour of School-aged Children (HBSC) Study*

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# Introduction

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According to the World Health Organization, around 10 to 20% of all children and adolescents worldwide live with mental health problems.<sup>1</sup>

Approximately 50% of mental health diagnoses are received by adolescents at the age of 14 years and 75% at the age of 19 years.<sup>1</sup>

The use of social media use is a central focus in the lives of many adolescents.<sup>2</sup> As such, there is a need to better understand the link between mental health and social media use.

Some researchers have suggested that it is not general social media use but rather problematic social media use (indicated by behavioural and psychological symptoms of addiction to social media) that is associated with difficulties in academic functioning, psychosocial functioning, mental health symptoms, and cyber-bullying.<sup>3-6</sup>

Most research has focused on either problematic or non-problematic social media use. There is little research on varying degrees of problematic social media use on adolescent mental health and well-being.

The current study investigated 1) the prevalence of mental health outcomes (e.g., psychological symptoms, emotional problems, and life satisfaction) among adolescents (grades 6 to 10) in Canada, and 2) the association between varying degrees of problematic social media use with these mental health measures.



# Mental Health of Canadian Adolescents

Grades 6 to 8 students reported having better mental health than Grades 9 to 10 students. For both boys and girls, the prevalence of psychological symptoms and emotional problems increased, and the prevalence of high life satisfaction decreased, from Grades 6 to 8 to Grades 9 to 10.

Boys reported having better mental health than girls. More girls than boys reported psychological symptoms and emotional problems, and more boys than girls reported high life satisfaction.

Students who reported not being financially well off were more likely to report having psychological symptoms and emotional problems, and less likely to report life satisfaction than students who reported being financially well off.

**Table 1. Mental health of Canadian adolescents by participant characteristics**

	High psychological symptoms Weighted % (95% CI)	High emotional problems Weighted % (95% CI)	High life satisfaction Weighted % (95% CI)
<b>Total sample</b>	28.59 (27.14, 30.08)	13.66 (12.55, 14.85)	50.60 (48.51, 52.68)
<b>Girls</b>	37.03 (34.94, 39.17)	18.15 (16.57, 19.84)	44.77 (42.47, 47.10)
<b>Boys</b>	17.73 (16.37, 19.17)	7.58 (6.60, 8.70)	58.58 (56.04, 61.08)
<b>Grade 6 to 8</b>	24.36 (22.72, 26.09)	12.51 (11.17, 13.99)	55.99 (53.27, 58.67)
<b>Grade 9 to 10</b>	34.26 (32.42, 36.14)	15.20 (13.63, 16.91)	43.34 (40.82, 45.90)
<b>Foreign born</b>	28.94 (27.40, 30.53)	13.76 (12.59, 15.01)	51.29 (49.24, 53.34)
<b>Canadian born</b>	26.06 (22.92, 29.48)	12.76 (10.54, 15.37)	45.56 (41.05, 50.16)
<b>Perceived family wealth: Financially well-off</b>	22.88 (21.41, 24.42)	9.73 (8.73, 10.84)	60.43 (58.09, 62.72)
<b>Perceived family wealth: Average</b>	33.75 (31.70, 35.87)	16.51 (14.67, 18.53)	39.35 (36.86, 41.90)
<b>Perceived family wealth: Not financially well-off</b>	47.26 (42.91, 51.66)	28.09 (24.72, 31.72)	34.80 (30.02, 39.91)

See Methods for details regarding 'high psychological symptoms', 'high emotional problems' and 'high life satisfaction'.

Source: Health Behaviour in School-aged Children (HBSC), Canada, 2018

## Risk of Problematic Social Media Use by Characteristics

Overall, 6.85% of students were classified as having problematic social media use (PSMU), 33.14% of students as being at moderate risk for PSMU and 60.00% of students as being at low risk for PSMU.

Girls were more likely to be classified as having PSMU (7.96%) than boys (5.35%).

Students in Grades 9 to 10 were more likely to be classified as having PSMU (8.10%) than those in Grades 6 to 8 (5.93%).

**Table 2. Risk of problematic social media use by participant characteristics**

	Low risk of PSMU Weighted % (95% CI)	Moderate risk of PSMU Weighted % (95% CI)	PSMU Weighted % (95% CI)
<b>Total sample</b>	60.00 (58.29, 61.69)	33.14 (31.64, 34.69)	6.84 (6.15, 7.61)
<b>Girls</b>	54.01 (51.69, 56.31)	38.03 (36.05, 40.06)	7.96 (6.95, 9.10)
<b>Boys</b>	67.71 (65.99, 69.38)	26.95 (25.35, 28.61)	5.35 (4.59, 6.22)
<b>Grade 6 to 8</b>	63.08 (61.08, 65.04)	30.99 (29.19, 32.85)	5.93 (5.17, 6.80)
<b>Grade 9 to 10</b>	55.85 (53.51, 58.17)	36.05 (34.02, 38.12)	8.10 (7.00, 9.35)
<b>Foreign born</b>	48.62 (44.91, 52.35)	40.98 (37.27, 44.81)	10.39 (8.20, 13.08)
<b>Canadian born</b>	61.62 (60.02, 63.21)	32.00 (30.56, 33.46)	6.38 (5.70, 7.13)
<b>Perceived family wealth: Financially well-off</b>	64.58 (62.67, 66.44)	29.59 (27.85, 31.40)	5.83 (5.07, 6.69)
<b>Perceived family wealth: Average</b>	54.97 (52.32, 57.60)	37.27 (34.74, 39.87)	7.75 (6.62, 9.06)
<b>Perceived family wealth: Not financially well-off</b>	52.72 (48.44, 56.95)	38.15 (34.04, 42.44)	9.13 (7.06, 11.70)

Problematic social media use was determined from the number of problematic behaviours related to social media use. The survey used the Social Media Disorder Scale to ask students if they experienced nine problematic behaviours related to social media use in the past year. Respondents were classified as having PSMU if they reported 6 to 9 problematic behaviours; moderate risk of PSMU if they reported 2 to 5; and low risk of PSMU if they reported 0 to 1.

- Low Risk of PSMU is the reference category
- RR, relative risk; CI, confidence interval; PSMU, problematic social media use

Source: Health Behaviour in School-aged Children (HBSC), Canada, 2018

# Association Between Mental Health and Problematic Social Media Use by Gender

Moderate risk of PSMU and PSMU were associated with a greater risk of reporting high psychological symptoms and emotional problems for both boys and girls. In addition, moderate risk of PSMU and PSMU was negatively associated with high life satisfaction.

The association between PSMU and psychological problems was stronger for boys (PSMU RR = 3.15) than girls (PSMU RR = 2.16).

The association between PSMU and high emotional problems was similar for boys and girls (PSMU RR = 3.88 and 2.92, respectively).

The association between PSMU and high life satisfaction was stronger for girls (PSMU RR = 0.51) than boys (PSMU RR = 0.63).

**Table 3. Association between mental health and problematic social media use by gender**

	High psychological symptoms Adjusted RR (95% CI)	High emotional problems Adjusted RR (95% CI)	High life satisfaction Adjusted RR (95% CI)
<b>Overall:</b>			
<b>Moderate risk of PSMU</b>	1.85 (1.71, 2.01)	2.23 (1.98, 2.51)	0.69 (0.66, 0.73)
<b>PSMU</b>	2.64 (2.37, 2.94)	3.45 (2.94, 4.06)	0.54 (0.47, 0.62)
<b>Boys: Moderate risk of PSMU</b>	1.88 (1.60, 2.21)	2.19 (1.69, 2.83)	0.80 (0.75, 0.85)
<b>Boys: PSMU</b>	3.15 (2.55, 3.90)	3.88 (2.70, 5.56)	0.63 (0.52, 0.76)
<b>Girls: Moderate risk of PSMU</b>	1.63 (1.49, 1.78)	1.96 (1.69, 2.27)	0.65 (0.61, 0.70)
<b>Girls: PSMU</b>	2.16 (1.90, 2.45)	2.92 (2.44, 3.50)	0.51 (0.41, 0.63)

- Low Risk of PSMU is the reference category
- RR, relative risk; CI, confidence interval; PSMU, problematic social media use
- Adjusted models controlled for gender (except in gender stratified analyses), grade, country of birth, perceived family wealth

Source: Health Behaviour in School-aged Children (HBSC), Canada, 2018



## Association Between Mental Health and Problematic Social Media Use by Gender and Grade

Across gender and grade groups, there was a gradient in risk of poor mental health among those at moderate risk of PSMU and PSMU.

The association between PSMU and poor mental health was particularly strong among boys in Grades 9 to 10 who had about 5 times the risk of reporting high emotional problems, and boys in Grades 6 to 8 who had about 3.5 times the risk of reporting high psychological symptoms, relative to their peers who were at low risk of PSMU.

The inverse association between PSMU and high life satisfaction was greatest in Grades 6 to 8 girls (PSMU RR = 0.40) and lowest among Grades 6 to 8 boys (PSMU RR = 0.73) relative to their peers who were at low risk of PSMU.

Gender was found to modify the association between PSMU and poor mental health in both Grades 6 to 8 and Grades 9 to 10, except for high emotional problems where the association was similar in boys and girls from Grades 6 to 8.

**Table 4. Association between mental health and problematic social media use by gender and grade**

	High psychological symptoms Adjusted RR (95% CI)	High emotional problems Adjusted RR (95% CI)	High life satisfaction Adjusted RR (95% CI)
<b>Boys grades 6 to 8: Moderate risk of PSMU</b>	1.81 (1.41, 2.32)	2.49 (1.77, 3.51)	0.81 (0.74, 0.88)
<b>Boys grades 6 to 8: PSMU</b>	3.46 (2.56, 4.70)	3.08 (1.78, 5.33)	0.73 (0.58, 0.92)
<b>Boys grades 9 to 10: Moderate risk of PSMU</b>	1.95 (1.60, 2.38)	1.92 (1.31, 2.81)	0.79 (0.70, 0.88)
<b>Boys grades 9 to 10: PSMU</b>	2.92 (2.26, 3.79)	4.96 (3.15, 7.79)	0.49 (0.38, 0.64)
<b>Girls grades 6 to 8: Moderate risk of PSMU</b>	1.93 (1.69, 2.20)	2.16 (1.73, 2.70)	0.66 (0.59, 0.73)
<b>Girls grades 6 to 8: PSMU</b>	2.85 (2.35, 3.46)	3.31 (2.57, 4.26)	0.40 (0.30, 0.54)
<b>Girls grades 9 to 10: Moderate risk of PSMU</b>	1.42 (1.26, 1.59)	1.82 (1.43, 2.31)	0.63 (0.56, 0.71)
<b>Girls grades 9 to 10: PSMU</b>	1.80 (1.53, 2.11)	2.80 (2.13, 3.66)	0.63 (0.47, 0.83)

- Low Risk of PSMU is the reference category
- RR, relative risk; CI, confidence interval; PSMU, problematic social media use
- All models are adjusted for country of birth and perceived family wealth

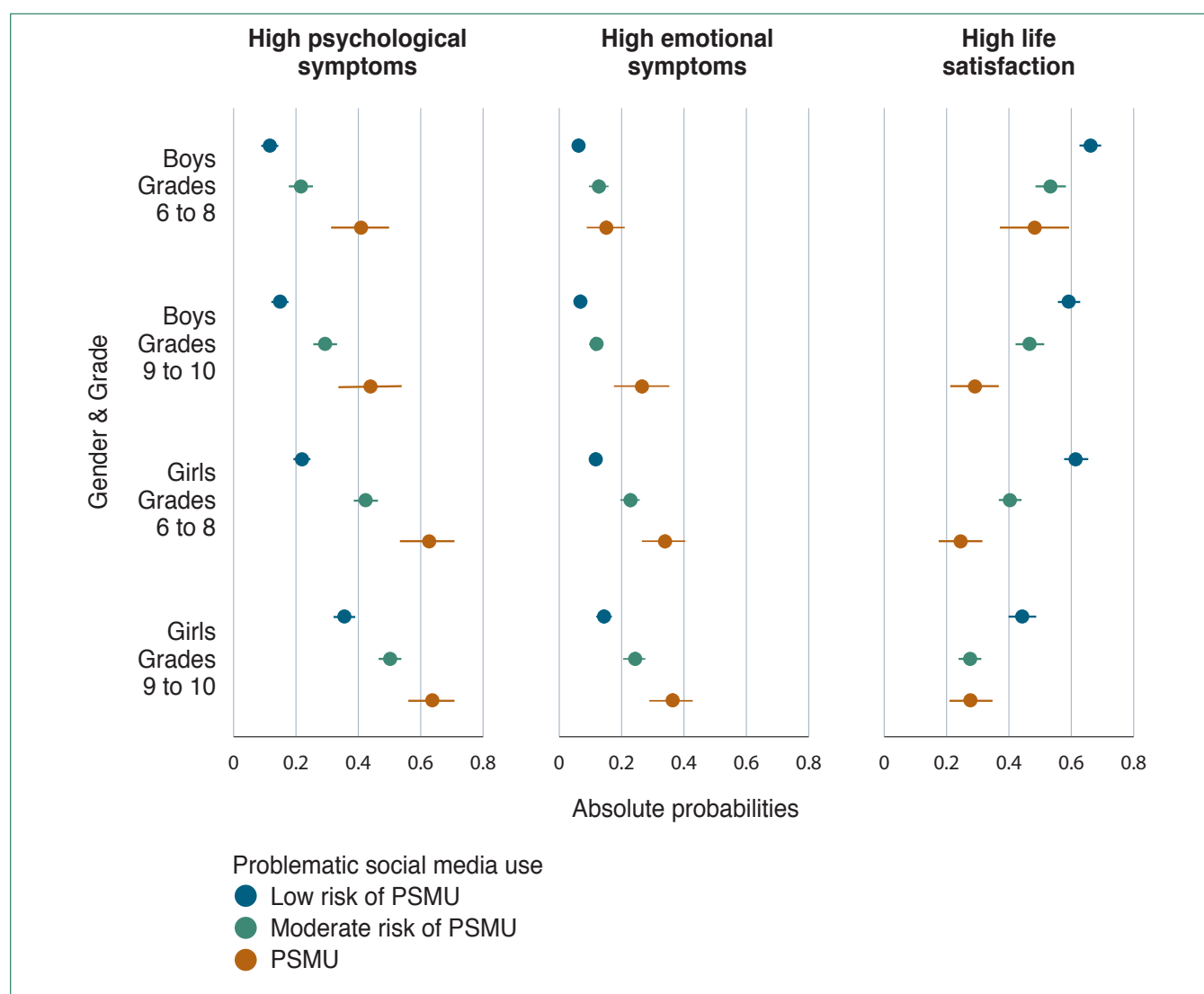
Source: Health Behaviour in School-aged Children (HBSC), Canada, 2018

# Predicted Probabilities of Mental Health Outcomes by Problematic Social Media Use Across Gender and Grade

Figure 1 shows that the absolute probability of high psychological symptoms and emotional problems was higher in girls than in boys, across grades.

Across almost all gender and grade groups, there was a gradient in risk of poor mental health with greater risk of PSMU.

**Figure 1. Predicted probabilities of mental health outcomes by problematic social media use across gender and grade**



All models are adjusted for country of birth and perceived family wealth.

Source: Health Behaviour in School-aged Children (HBSC), Canada, 2018



## Limitations

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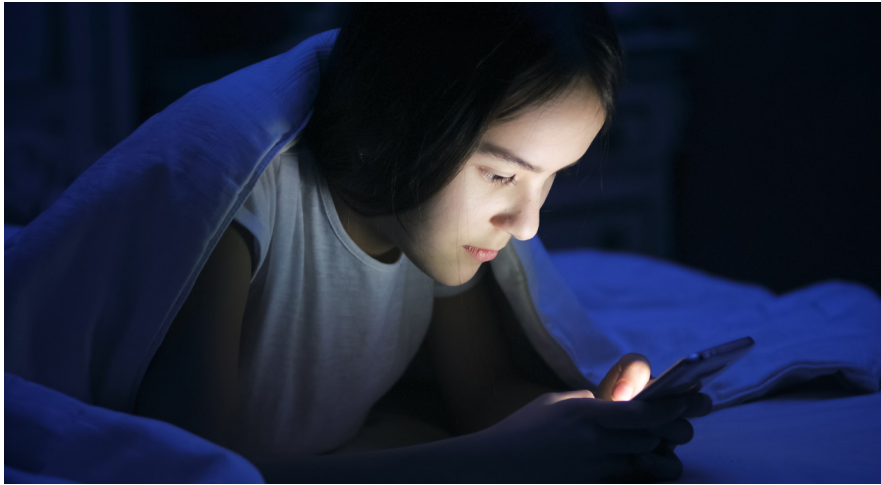


All research studies have limitations, and it is important to interpret results in light of their limitations.

1. All data in the HBSC were collected using self-report, which is prone to reporting biases. For example, youth have difficulty recalling past social media use.<sup>7</sup> Light mobile phone users tend to overestimate their use, while heavy users may underestimate their use.<sup>8</sup>
2. The cross-sectional design of the HBSC does not allow for the inference of causality. For example, it is possible that problematic social media use led to poorer mental health. It is also possible that poorer mental health led to problematic social media use or something else may have led to both.
3. Students were asked to respond to the question “Are you male or female?” by selecting from the three responses, “male”, “female” or “neither term describes me”. Students who indicated “neither term describes me” did not comprise a large enough group to include in the statistical analyses.

## Conclusions

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Nearly one third of adolescents reported high psychological symptoms; about 14% reported high emotional problems; and only about half reported high life satisfaction.

With 40% of adolescents being classified as having PSMU or at moderate risk for PSMU, it is important to understand the implications this technological trend has on the mental health of Canadian youth.

Adolescents who were classified as having PSMU and at moderate risk of PSMU were more likely to report high psychological symptoms, high emotional problems, and less likely to report high life satisfaction, compared to adolescents at low risk of PSMU.

While boys who were classified as having PSMU were more likely to report poor mental health compared to other boys, girls reported poorer mental health overall compared to boys.

Social media will continue to be an important tool for youth, and as such, it is important to understand the processes that are related to creating healthy and unhealthy patterns of social media use.

# Methods

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## Data source

Data were from the Canadian Health Behaviour in School-aged Children (HBSC) study, a national cross-sectional study of adolescents conducted every four years since 1989-90 ([www.hbsc.org](http://www.hbsc.org))<sup>9</sup>. In 2018, data were collected in school settings from a nationally representative random two-stage cluster sample of adolescents in grades 6 to 10 from all provinces and two territories in Canada. For this study, we included the 15,184 participants who responded to items on social media use.

## Measures

Mental health measures included psychological symptoms, emotional problems, and life satisfaction. Psychological symptoms were measured from the HBSC symptom checklist<sup>11</sup> that asked about the frequency of four psychological health complaints over the past 6 months, including “feeling low/depressed”, “irritability or bad temper”, feeling nervous”, and “difficulties getting to sleep”. Responses were scored on a 5-point scale ranging from 1 (rarely or never) to 5 (about every day) ( $\alpha = 0.78$ ). We calculated the sum score and classified participants as experiencing high psychological symptoms if they had a score of 12 or more, equivalent to an average rating of “about every week” or more frequent across the 4 psychological symptoms. Emotional problems were assessed using the Emotional Problems Index<sup>10</sup> which asked how much the student agreed with the following five emotional concerns: “I often wish I were someone else”; “I often feel helpless”; “I would change how I look if I could”; “I often feel left out of things”; “I often feel lonely”. Response categories ranged from 1 (strongly disagree) to 5 (strongly agree) ( $\alpha = .88$ ). We calculated the sum score and classified participants as experiencing high emotional problems if they had a score of 20 or more, equivalent to an average response of “agree” and “strongly agree” across the five emotional problems. Finally, the survey assessed life satisfaction using the Cantril ladder. The participants were asked where they felt their life ranked at the moment on a scale of 0 (worst possible life) to 10 (best possible life). We defined high life satisfaction using a cut-off score of 8 or higher.<sup>11</sup>

Problematic social media use (PSMU) was assessed using the nine-item Social Media Disorder Scale (SMDS).<sup>4</sup> The SMDS is a validated and reliable scale that asks students if they experienced (yes/no) nine problem behaviours related to social media use in the past year.<sup>4</sup> Respondents were classified as having PSMU (sum score 6 to 9), moderate risk of PSMU (sum score 2 to 5), and low risk of PSMU (sum score 0 to 1).<sup>4</sup>

We included information on grade (grades 6 to 10), gender (boy; girl), country of birth (Canadian; non-Canadian), and perceived wealth. Perceived wealth was assessed by asking students how well off they thought their family was. Responses ranged from “not well off at all” to “very well off”. We collapsed the responses into three categories of well-off (quite well off/very well off), average (average), and not well-off (not very well off/not at all well off).

## Statistical analyses

We tested the association between PSMU and mental health measures using modified poisson regression models to estimate the relative risk of high psychological symptoms, emotional problems, and life satisfaction in unadjusted models and in models adjusted for gender, grade, country of birth, perceived family wealth. We further conducted stratified analyses by gender and grade. We presented the predicted probabilities of high psychological symptoms, emotional problems, and life satisfaction (from the Poisson models) by gender and grade group using the margins and coefplot commands in Stata. All variables had between 0 and 5% missing data. Analyses were done using Stata/SE 15 and accounted for clustering at the school level and incorporated sampling weights to ensure results were nationally representative.

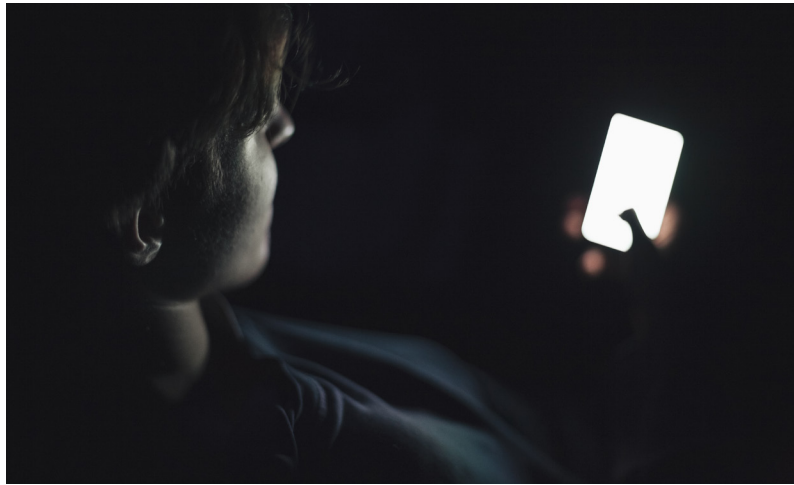
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