

## Supplementary Online Content

Nagata JM, Cortez CA, Cattle CJ, et al. Screen time use among US adolescents during the COVID-19 pandemic: findings from the Adolescent Brain Cognitive Development (ABCD) Study. *JAMA Pediatr*. Published online November 1, 2021.  
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**eMethods.** Supplemental Methods

**eReferences**

This supplementary material has been provided by the authors to give readers additional information about their work.

## **eMethods. Supplemental Methods**

### **Study Design**

The Adolescent Brain Cognitive Development (ABCD) Study is a large, diverse, national prospective cohort study of brain development and health across adolescence. The baseline sample (2016-2018) included 11,875 children recruited at random from a probability sample of schools within 21 catchment areas around the US. Additional information about the ABCD study design, recruitment, and propensity weights have been previously reported.<sup>1-3</sup> The included subsample (n=5,412) retained a higher proportion of female, White, Asian, high-income, and higher parent education participants compared to those excluded due to nonresponse or missing data (n=6,463).

### **Measures**

#### ***Mental Health:***

Participants were asked, “How do you think your mental health (emotional well-being) is in the past week compared to normal?” Responses included: 1 = “much worse”; 2 = “a little worse”; 3 = “about the same”; 4 = “a little better”; 5 = “much better.”

#### ***COVID-Related Worry:***

Participants were asked five questions:

1. “How worried have others around you been about coronavirus (COVID-19)?”
2. “How much do you think your life has changed due to coronavirus (COVID-19)?”
3. “How hopeful are you that the coronavirus/COVID-19 crisis in your area will end soon?”
4. “COVID-19 presents a lot of uncertainty about the future. In the past 7 days, including today, how stressful have you found this uncertainty to be?”
5. “In the past week...How worried have you been about coronavirus (COVID-19)?”

Responses included: 1 = “not at all”; 2 = “slightly”; 3 = “moderately”; 4 = “very”; 5 = “extremely.”

Responses to question 3 were reverse coded. Responses to all five questions were summed and averaged to calculate a final score.

#### ***Perceived Stress:***

Four questions were asked to participants regarding perceived stress from the Perceived Stress Scale<sup>4</sup>:

1. “In the last month, how often have you felt confident about your ability to handle your personal problems?”
2. “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?”
3. “In the last month, how often have you felt that you were unable to control the important things in your life?”
4. “In the last month, how often have you felt that things were going your way?”

Youth responses included: 0 = “never”; 1 = “almost never”; 2 = “sometimes”; 3 = “fairly often”; 4 =

“very often.” Questions 1 and 4 were reversed coded. Responses to all four questions were summed and averaged to calculate final score.

#### ***Social Support:***

Two questions regarding social support were asked to participants:

1. “In the last week, the relationships between members of your family are...”
2. “In the last week, your friendships are:...”

Responses included: 1 = “A lot worse” ; 2 = “A little worse” ; 3 = “About the same” ; 4 = “A little better”; 5 = “A lot better.” Responses to both questions were summed and averaged to calculate a final score.

### ***Coping Behaviors:***

Nine coping behaviors options were given to participants, with the following question stem: “And finally, in the past week, to cope, have you done any of the following?”

1. “Took breaks from watching, reading, or listening to news stories, including social media”
2. “Participated in a neighborhood social distance activity (such decorated windows or driveway, singing from balcony or porch)”
3. “Took care of your body, such as taking deep breaths, stretching, or meditating”
4. “Exercised (such as walking, running, or an online exercise class)”
5. “Spent more time on hobbies, or started a new one”
6. “Engaged in healthy behaviors, like trying to eat healthy, getting plenty of sleep”
7. “Made time to relax”
8. “Connected with others online or by phone”
9. “None of the above”

Responses included: 1 = “Yes” and 2 = “No.” “Yes” responses for options 1-8 were summed. Responses for option 9 were excluded from the calculations, as a score of 0 already indicates “none of the above.”

### ***Screen Time:***

The instructions for questions in this section specified, “Please do NOT include time spent on school related work.” Participants were asked, “On an average day in the past week, how much time do you:”

1. “Play single-player video games on a computer, console, phone or other device (Xbox, PlayStation, iPad, AppleTV)?”
2. “Play multiplayer video games on a computer, console, phone, or other device (Xbox, PlayStation, iPad, AppleTV) where you can interact with others in the game?”
3. “Text on a cell phone, tablet, computer, iPod, or other electronic device (e.g., GChat, Whatsapp, Kik etc.)?”
4. “Visit social media apps (e.g., Snapchat, Facebook, Twitter, Instagram, TikTok, etc.? (Do not include time spent editing photos or videos to post on social media.)”
5. “Video chat (Skype, FaceTime, VRchat, etc.) that is NOT for school”
6. “Searching or browsing the internet (e.g., using Google) that is NOT for school”
7. “Watch "or stream" movies, videos or TV shows? (such as Hulu, Netflix, Amazon, YouTube, Twitch)”

Response options included 0 min, 15 mins, 30 mins, 45 mins, 1 hr, 1.5 hrs, 2 hrs, 2.5 hrs, 3 hrs and every additional hour up until 24 hrs. Total screen time was calculated by summing average screen time of these seven modalities.

## eReferences

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