

**Change in Screen Time and Overuse, and their Association with Psychological Well-being Among US-wide School-Age Children During the COVID-19 Pandemic: Analysis of the National Survey of Children's Health (NSCH) Years 2018-21**

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NSCH survey variable (variable name according to the public use data file) and detailed description of the question and answer choices on the original survey	Recoded variable used in this study
<p><b>Recreational screen time (SCREENTIME).</b>            "On most week days, about how much time did this child spend in front of a TV, computer, cellphone or other electronic device watching programs, playing games, accessing the internet or using social media, not including school work?"            Answer choices: 1 = Less than 1 hour, 2 = 1 hour, 3 = 2 hours, 4 = 3 hours or 5 = 4 or more hours.</p>	<p><b>Screen Time</b>            0.5 = SCREENTIME of 1 (i.e. Less than 1 hour),            1 = SCREENTIME of 2 (i.e. 1 hour),            2 = SCREENTIME of 3 (i.e. 2 hours),            3 = SCREENTIME of 4 (i.e. 3 hours),            4 = SCREENTIME of 5 (i.e. 4 or more hours).</p>
<p><b>Ability to remain calm and in control when challenged (K7Q85_R).</b>            "How often: Does this child stay calm and in control when faced with a challenge?"            Answer choices: 1 = Always, 2 = Usually, 3 = Sometimes, 4 = Never.</p>	<p><b>Not Calm</b>            1 = K7Q85_R value of 3 or 4, indicating the child does not stay calm or in control,            0 = K7Q85_R value of 1 or 2, indicating the child does stay calm or in control.</p>
<p><b>Children who argue too much (K7Q70_R).</b>            "How often: Does this child argue too much?"            Answer choices: 1 = Always, 2 = Usually, 3 = Sometimes, 4 = Never.</p>	<p><b>Argues Too Much</b>            1 = K7Q70_R1 value of 1 or 2, indicating the child argues too much,            0 = K7Q70_R1 value of 3 or 4, indicating the child does not argue too much.</p>
<p><b>Difficulty making or keeping friends (MAKEFRIEND).</b>            "Compared to other children his or her age, how much difficulty does this child have making or keeping friends?"            Answer choices: 3 = A lot of difficulty, 2 = A little difficulty, 1 = No difficulty.</p>	<p><b>Difficult to Make Friends</b>            1 = MAKEFRIEND of 2 or 3, indicating the child has difficulty making or keeping friends,            0 = MAKEFRIEND of 1, indicating the child does not have difficulty making or keeping friends.</p>
<p><b>Children who work to finish the tasks they start (K7Q84_R).</b>            "How often: Does this child work to finish tasks they start?"            Answer choices: 1 = Always, 2 = Usually, 3 = Sometimes, 4 = Never.</p>	<p><b>Does Not Finish Tasks</b>            1 = K7Q84_R value of 3 or 4, indicating the child does not finish tasks,            0 = K7Q84_R value of 1 or 2, indicating the child does finish tasks.</p>
<p><b>Children who show interest and curiosity in learning new things (K6Q71_R).</b>            "How often: Does this child show interest and curiosity in learning new things?"            Answers choices: 1 = Always, 2 = Usually, 3 = Sometimes, 4 = Never.</p>	<p><b>Not Curious</b>            1 = K6Q71_R value of 3 or 4, indicating the child does not show interest or curiosity,            0 = K6Q71_R value of 1 or 2, indicating the child does show interest and curiosity.</p>
<p><b>Parent felt a child is difficulty to care for (K8Q31).</b>            "During the past month, how often have you felt: that this child is much harder to care for than most children his or her age?"            Answers choices: 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Usually, 5 = Always.</p>	<p><b>Difficult to Care</b>            1 = K8Q31 value of 3, 4 or 5, indicating the child is difficult to care for,            0 = K8Q31 value of 1 or 2, indicating the child is not difficult to care for.</p>
<p><b>Been diagnosed with depression (K2Q32A)</b>            "Has a doctor or other health care provider EVER told you that this child has depression?" Answers choices: 1 = Yes, 2 = No.</p>	<p><b>Depression</b>            1 = K2Q32A value of 1, indicating a doctor or other health care provider has diagnosed that the child has depression,            0 = K2Q32A value of 2, indicating the child has not been diagnosed with depression.</p>
<p><b>Been diagnosed with anxiety (K2Q33A)</b>            "Has a doctor or other health care provider EVER told you that this child has anxiety?" Answers choices: 1 = Yes, 2 = No.</p>	<p><b>Anxiety</b>            1 = K2Q33A value of 1, indicating the child ever had anxiety,            0 = K2Q33A value of 2, indicating the child has never had anxiety.</p>

**Table S1: Description of NSCH survey questions and answer choices and variables used in this study**

PWIS	Values	Definition
PWBIS1	0 - 6	Sum of six symptom dichotomous variables excluding depression and anxiety ( <i>Not Calm, Argues Too Much, Difficult to Make Friends, Does Not Finish Tasks, Not Curious, and Difficult to Care</i> )
PWBIS2	1 or 0	1 = has at least one of the eight symptoms ( <i>Not Calm, Argues Too Much, Difficult to Make Friends, Does Not Finish Tasks, Not Curious, Difficult to Care, Depression, or Anxiety</i> ), or 0=none of the symptoms

**Table S2: Description of the construction of the well-being scores, PWBIS1 and PWBIS2.**

GLS models for the PWBIS1 outcome	
<b>Model1</b>	$PWBIS1_{Model1} = \alpha + \beta_1 \text{ Screen Time/Overuse} + \beta_2 \text{ Age} + \beta_3 \text{ Sex-male} + \beta_4 \text{ Race-Black}$ $+ \beta_5 \text{ Race-American Indian or Alaska native} + \beta_6 \text{ Race-Asian}$ $+ \beta_7 \text{ Race-Hawaiian or Pacific Islander} + \beta_8 \text{ Race-Other} + \beta_9 \text{ Race-Two or More Races}$ $+ \beta_{10} \text{ Ethnicity-Hispanic or Latino} + \beta_{11} \text{ Poverty Ratio} + \mathcal{E}$
<b>Model2</b>	$PWBIS1_{Model2} = \alpha + \beta_1 \text{ Screen Time/ Overuse} + \beta_2 \text{ Pandemic 2020} + \beta_3 \text{ Screen Time/ Overuse} * \text{Pandemic 2020}$ $+ \beta_4 \text{ Age} + \beta_5 \text{ Sex-male} + \beta_6 \text{ Race-Black} + \beta_7 \text{ Race-American Indian or Alaska native}$ $+ \beta_8 \text{ Race-Asian} + \beta_9 \text{ Race-Hawaiian or Pacific Islander} + \beta_{10} \text{ Race-Other}$ $+ \beta_{11} \text{ Race-Two or More Races} + \beta_{12} \text{ Ethnicity-Hispanic or Latino} + \beta_{13} \text{ Poverty Ratio} + \mathcal{E}$
Logistic regression models for the PWBIS2 outcome	
<b>Model3</b>	$PWBIS2_{Model3} = \alpha + \beta_1 \text{ Screen Time/ Overuse} + \beta_2 \text{ Elementary School} + \beta_3 \text{ Junior School} + \beta_4 \text{ Sex-male}$ $+ \beta_5 \text{ Race-Black} + \beta_6 \text{ Race-American Indian or Alaska Native} + \beta_7 \text{ Race-Asian}$ $+ \beta_8 \text{ Race-Hawaiian or Pacific Islander} + \beta_9 \text{ Race-Other} + \beta_{10} \text{ Race-Two or More Races}$ $+ \beta_{11} \text{ Ethnicity-Hispanic or Latino} + \beta_{12} \text{ Poverty Ratio} + \mathcal{E}$
<b>Model4</b>	$PWBIS2_{Model4} = \alpha + \beta_1 \text{ Screen Time/ Overuse} + \beta_2 \text{ Pandemic 2020} + \beta_3 \text{ Screen Time/ Overuse} * \text{Pandemic 2020}$ $+ \beta_4 \text{ Elementary School} + \beta_5 \text{ Junior School} + \beta_6 \text{ Sex-male} + \beta_7 \text{ Race-Black}$ $+ \beta_8 \text{ Race-American Indian or Alaska Native} + \beta_9 \text{ Race-Asian}$ $+ \beta_{10} \text{ Race-Hawaiian or Pacific Islander} + \beta_{11} \text{ Race-Other} + \beta_{12} \text{ Race-Two or More Races}$ $+ \beta_{13} \text{ Ethnicity-Hispanic or Latino} + \beta_{14} \text{ Poverty Ratio} + \mathcal{E}$

**Table S3: Description of the GLS and logistic regression models constructed.**