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Attention-Deficit/Hyperactivity Disorder and Teen Self-Report on Health Behaviors and Social-Emotional Wellbeing: United States, July 2021–December 2022

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Abstract

Objective: Promoting health during adolescence can support long-term well-being, especially for teens diagnosed with attention-deficit/hyperactivity disorder (ADHD), who face increased risks due to the disorder's impact on development and health behaviors. ADHD is often associated with difficulties in social interactions, a higher likelihood of bullying involvement, and co-occurring mental health conditions. These factors may also be influenced by health factors such as physical activity, sleep quality, and screen time usage. Nationally representative teen self-reports provide a novel perspective on ADHD-related health outcomes compared with relying on parent reports.

Method: We used nationally representative data from the National Health Interview Survey (NHIS) and NHIS-Teen from July 2021 to December 2022, to examine teen-reported health and well-being factors, stratified by parent-reported ADHD diagnoses among teens aged 12 to 17 years. Weighted prevalence estimates and adjusted prevalence ratios (aPR) adjusting for teen age, sex, and family income, all with 95% confidence intervals (CIs), were calculated.

Results: Just over 10% of teens had ADHD and they reported higher prevalence of bullying victimization (aPR = 1.64, CI = 1.27–2.11), difficulties making friends (aPR = 1.83, CI = 1.15–2.90), difficulty getting out of bed (aPR = 1.29, CI = 1.02–1.64), irregular wake times (aPR = 2.17, CI = 1.45–3.25), and .4 hours daily screen time (aPR = 1.26, CI = 1.05–1.52) than teens without ADHD; teens with ADHD reported a lower prevalence of lacking peer support (aPR = 0.70, CI = 0.51–0.96).

Conclusion: Teens with ADHD face distinct challenges related to social-emotional well-being and health behaviors that support overall wellness. Findings may inform opportunities for health promotion among teens with ADHD.

Index terms:

ADHD; interpersonal relations; health risk behaviors; adolescent; mental health

Promoting health during the teenage years can lay the foundation for long-term mental and physical well-being.¹ Teens with attention-deficit/hyperactivity disorder (ADHD) are at higher risk for poor health outcomes than their peers without ADHD.² This may be due to ADHD negatively affecting adolescent development and affecting health behaviors that support long-term physical and mental health.² Compared with their peers, children and teenagers with ADHD often experience challenges in relationships with parents or caregivers and social interactions with peers and are more likely to have co-occurring mental health problems.^{2,3} In addition, they exhibit more bullying behaviors and are more likely to be victims of bullying than their peers.⁴

Variation in social and cognitive well-being among teens with ADHD is associated with variation in health behaviors, such as physical activity, sleep, and screen time.⁵ Compared with their peers, children with ADHD may be more likely to have unhealthy lifestyles, such as having high daily screen time, insufficient sleep and poor sleep quality,^{5,6} lower levels of physical activity,⁷ and increased risk for body dissatisfaction.⁸

Studies of teen health factors such as well-being, social relationships, and health behaviors often use parent report.^{5,7} For example, child self-report on internalized symptoms (e.g., depression and anxiety) may have limited agreement with parent report or clinical observations among children with ADHD.^{9,10} Teens also differ from their parents when reporting on their own social relationships and health behaviors.¹¹ In addition, teens with ADHD may also provide different reports compared with their parents about their own symptoms and treatment needs.^{10,12,13} Directly asking teens about their experiences may yield unique information, particularly when examining patterns of health and well-being factors.

This report expands on what is known about health behaviors and social-emotional well-being in teens with and without ADHD by describing a range of teen-reported factors. These factors include social and emotional well-being (difficulty making friends, lack of social and emotional support, bullying, mood disorder symptoms, low life satisfaction, mental health treatment needs), and health behaviors (sleep problems, lack of physical activity, high daily screen time, unhealthy weight), among a nationally representative sample of US teens, adjusting for individual covariates (age, sex, and family income). We examined the association of ADHD with prevalence of risk across the health and well-being factors.

METHODS

Data were from the National Health Interview Survey (NHIS) and the National Health Interview Survey-Teen (NHIS-Teen) collected between July 2021 and December 2022 (N = 1176). The NHIS is an annual cross-sectional household survey of the civilian noninstitutionalized population. For each selected household, NHIS first collects a roster containing basic demographic information of all household members and then randomly

selects 1 adult aged 18 years or older (“Sample Adult”) and 1 child (“Sample Child”) from each household to respond to a more detailed health interview. A knowledgeable adult, usually a parent, responsible for the child’s health responds on behalf of the Sample Child. Interviews are typically conducted in respondents’ homes by trained US Census Bureau personnel, but follow-ups to complete interviews may be conducted over the telephone. The response rate for the Sample Child interview was 49.9% in 2021 ([ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2021/srvydesc-508.pdf](ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2021/srvydesc-508.pdf)) and 45.8% in 2022 ([ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/srvydesc-508.pdf](ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/srvydesc-508.pdf)). The design of NHIS aims to yield nationally representative estimates ([ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2021/srvydesc-508.pdf](ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2021/srvydesc-508.pdf) and [ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/srvydesc-508.pdf](ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/srvydesc-508.pdf)).

NHIS-Teen is a pilot project conducted by the National Center for Health Statistics in which Sample Children between the ages of 12 and 17 years whose parents completed the NHIS Sample Child interview are invited to participate in a self-administered web-based survey, available in English, with options to request assistance if needed. Teens reported on items related to their own health and experiences, such as use of health care, sleep, physical activity, injuries, mental health, social and emotional supports, and experiences with bullying and discrimination. NHIS-Teen was also designed to yield nationally representative estimates of teen self-reported health. The NHIS–Teen completion rate from July 2021 to December 2022 among teenagers was 45.9%.¹¹ Detailed information about NHIS-Teen, including methodology and recruitment, can be found elsewhere.¹¹ The NCHS Ethics Review Board reviewed and approved NHIS-Teen protocols before survey implementation and data collection.

Measures

All demographic characteristics were based on parent report as collected in the NHIS Sample Child interview and included the child’s sex, age group, race/ethnicity (dichotomized as non-Hispanic white vs all other races and ethnicities combined due to limited sample size for more detailed subgroups), family income relative to federal poverty level, and highest parental education attainment among residential parents. ADHD diagnosis was also collected in the NHIS Sample Child interview and was based on affirmative report to a set of survey questions about whether the child ever received an ADHD diagnosis from a health care provider, and if yes, a follow-up question asked whether the child currently has ADHD.

We based our examination of health behavior and social-emotional well-being entirely from teen report in NHIS-Teen, and descriptions of measures included in analyses are outlined in Table 1. Briefly, indicators of difficulties making friends, lack of social and emotional support, peer support, parent support, or community support, bullying (as a victim or perpetrator), mood disorder symptoms for depression and anxiety, low life satisfaction, unmet mental health treatment needs, sleep behaviors, weekday screen time use (excluding schoolwork), physical activity, and weight concerns were included in analyses. Our study represents a secondary analysis of a previously collected, de-identified dataset.

Analyses

We stratified the sample's demographic characteristics by parent-reported current ADHD diagnoses. Next, we stratified and examined health behavior and well-being factors by current ADHD diagnoses. In addition, we examined associations between health behavior and well-being factors and current ADHD after adjusting for all demographic characteristics. Wald χ^2 tests with an α of 0.05 were used to define statistically significant differences across sociodemographic factors. Prevalence estimates with Korn-Gruabard 95% confidence intervals (CIs) and prevalence ratios (aPR) with 95% CI adjusting for teen age, sex, and family income were calculated. All estimates shown meet NCHS data presentation standards for proportions (www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf).

Analyses were conducted using SAS-callable SUDAAN version 11.0.1 (RTI International; Cary, NC). We used NHIS-Teen sampling weights in all analyses. Sample weights account for parent permission, teen non-response, and were post-stratified to population totals obtained from the NHIS allowing us to calculate nationally representative estimates (www.cdc.gov/nchs/data/nhis/teen/nhis-teen-weighting-18m-report.pdf). Item-level missingness was low within the analytic sample; 0.6% of responses were missing for ADHD diagnosis, and missing responses for health behavior and well-being factors ranged from 0% to 4.6%. Less than 1% of responses were missing for sex, and 3.2% were missing for highest parental educational attainment. NHIS imputed income files ([ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/NHIS2022-imputation-techdoc-508.pdf](ftp://cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2022/NHIS2022-imputation-techdoc-508.pdf)) were used, which use multiple imputation methodology to account for when family income was missing (10.8%). The analytic sample size was $n = 1169$; respondents with missing data for ADHD diagnosis ($n = 7$) were excluded from analyses, and those with missing data for health behavior and well-being factors were excluded from respective item-level analyses for associations with ADHD.

RESULTS

Demographic Characteristics

Among teens ages 12 to 17 years, 10.4% had an ADHD diagnosis. Teens with ADHD significantly differed from teens without ADHD by sex, age group, and race and Hispanic origin; teens with ADHD were more likely to be male (64.4%), aged 15 to 17 years (61.5%), and non-Hispanic White (66.8%; Table 2). Family income and highest parental education attained were not statistically different between those with and without ADHD.

ADHD and Social-Emotional Well-Being

Teens with ADHD more often reported having difficulties making friends compared with those without ADHD (23.6% vs 13.3%, aPR = 1.83, CI = 1.15–2.90; Table 3). By contrast, fewer teens with ADHD reported a lack of peer support (35.7%) compared with those without ADHD (51.5%) (aPR = 0.70, CI = 0.51–0.96). Lack of parental support was higher among teens with ADHD and those without ADHD (43.4% vs 35.1%) but not statistically significant (aPR = 1.29, CI = 0.97–1.71). Lack of social and emotional support did not differ significantly between teens with ADHD and those without ADHD (43.5% vs 41.3%) nor

did community support (15.9% vs 19.8%). Compared with those without ADHD, teens with ADHD more often experienced bullying victimization (49.1% vs 31.6%; aPR = 1.64, CI = 1.27–2.11); rather than bullying perpetration, which was similar among teens with and without ADHD. No significant differences were observed between those with ADHD and those without, respectively, for any depression or anxiety symptoms within the past 2 weeks (30.4% vs 26.7%) or unmet mental health needs (12.7% vs 21.1%). The prevalence of low life satisfaction was almost twice as high for teens with ADHD compared with those without (10.4% vs 5.9%), although the difference was only borderline significant (aPR = 1.93, CI = 1.00–3.74).

ADHD and Health Behaviors

Significantly more teens with ADHD reported having sleep problems than those without ADHD (79.9% vs 69.1%, aPR = 1.17, CI = 1.05–1.31). There were also significant differences for specific sleep problem indicators; difficulty getting up was more common among teens with ADHD (50.2%) compared with those without (40.2%; aPR = 1.29, CI = 1.02–1.64). Not having a regular waketime was twice as prevalent among teens with ADHD than those without (29.0% vs 14.0%; aPR = 2.17, CI = 1.45–3.25). Having 4 or more hours of screen time was more prevalent among teens with ADHD compared with teens without ADHD (63.6% vs 50.0%, aPR = 1.26, CI = 1.05–1.52). Teens with ADHD did not differ from those without ADHD for several measures including having less than 60 minutes of daily physical activity (75.5% vs 74.3%) and having a concern about their weight (29.4% vs 33.2%). As there were no meaningful differences seen between crude and adjusted prevalence ratios, only adjusted prevalence ratios are presented in Table 3. For crude prevalence ratios, see Supplemental Table 1, <http://links.lww.com/JDBP/A488>.

DISCUSSION

This study investigated self-reported health behaviors and social-emotional well-being among teenagers with and without diagnosed ADHD using a nationally representative sample. Several of the factors related to a lack of social and emotional well-being and health behaviors that can negatively affect well-being were associated with ADHD. Teens with ADHD more often reported bullying victimization and difficulty making friends than their peers without ADHD, although at the same time they less often reported a lack of peer support. Teens with ADHD were also more likely than those without ADHD to report any sleep problems, difficulties getting out of bed, lack of a regular wake time, and 4 or more hours of daily screen time. Understanding patterns of health and well-being factors that negatively affect physical and mental health among teens with ADHD have been shown to be an important step toward developing public health interventions to promote the health of teens in the United States with ADHD and reduce morbidity and mortality associated with the disorder.^{2,14}

Challenges with social relationships in adolescence place teens at risk for poor short-term academic and behavioral outcomes, as well as challenges in adult relationships.¹⁵ Adolescence is a critical period for developing social relationship skills with peers (i.e., empathy, morality, active listening, and interpretation of complex non-verbal cues) that serve

as building blocks for healthy relationships in adulthood.¹⁵ Our findings that teens with ADHD were more likely than their peers without ADHD to report bullying victimization and difficulty making friends is supported by existing research.^{4,16} Possible contributors to challenges with social relationships for children with ADHD include difficulties with social skills, social cognition, and emotional regulation associated with the core symptoms of ADHD (i.e., inattentiveness, impulsivity, and executive functioning problems).¹⁶

In several previous studies, teens with diagnosed ADHD reported lower levels of peer social support compared with their peers without ADHD.^{16,17} This was not evident in our study. We found that 1 in 3 teens with ADHD reported a lack of peer support compared with 1 in 2 among their peers without ADHD. Several factors could be influencing our findings. It is possible that a single mutual friendship is sufficient for teens with ADHD to report peer social support.¹⁸ It is also possible that when using a brief survey of peer support compared with more in depth assessments, teens with ADHD perceive greater social support than they are receiving. Normand, Mikami, Savalei, and Guet¹⁹ assessed friendship quality and reciprocated friendship using self-, parent-, and teacher-report and found that children with ADHD were more likely to underestimate negative and overestimate positive peer relationships compared with ratings by parents.

Teens with ADHD did not differ from teens without ADHD on some other factors related to social or emotional well-being, such as having depression or anxiety symptoms in the past 2 weeks. Based on U.S. population-based data from the 2022 National Survey of Children's Health, 43.3% of U.S. teenagers with ADHD currently had an anxiety diagnosis based on parent report of health care provider diagnosis,²⁰ higher than the 20.7% of teens with ADHD who reported anxiety symptoms within the past 2 weeks in our analysis. While parents play a crucial role in recognizing symptoms and seeking health care treatment and support for their teens, teens may have their own subjective experiences.²¹ In addition, the literature has found poor agreement between a child's perceived mental health and a parent's report of diagnosis,²¹ and differences between parents and teens on reports of factors related to teen mental health may be more pronounced among teens with ADHD.^{10,12} Future studies could explore the association between parent-reported ADHD diagnosis and teen-reported anxiety symptoms, to understand whether anxiety symptoms manifest differently in teens with ADHD and may be captured by different survey items. Furthermore, there is considerable heterogeneity among teens with ADHD regarding their self-perception; future studies could examine factors related to risk versus resilience among teens with ADHD.²²

When examining health behaviors such as sleep and screen time that support well-being, we noted that many teens, regardless of ADHD status, reported behavior that is associated with poor health outcomes. Among teens without ADHD, just over 3 in 5 teens reported at least 1 sleep problem, while significantly more teens with ADHD reported sleep problems, especially difficulty getting up and having a regular wake time. The association of sleep difficulties among teens with ADHD may be bidirectional, given that sleep problems may exacerbate attention difficulties and difficulties with self-regulation may affect sleep. However, ADHD may also be associated with neurological differences that increase the likelihood of difficulties with sleep regulation²³ and medication treatment for ADHD is associated with increased sleep problems.² While ADHD and sleep behaviors have noted

associations in the literature,⁶ our study found that the percentages of teens with ADHD reporting not being well rested, being tired, and taking naps/falling asleep were 3 to 8 percentage points higher than teens without ADHD. However, the prevalence ratios did not reach statistical significance.

Furthermore, a higher prevalence of teens with diagnosed ADHD also reported 4 or more hours of weekday screen time, not counting schoolwork, compared with their peers without ADHD. High daily screen time is a health concern for all children, with potential impact on long-term health and well-being,²⁴ and the COVID-19 pandemic has resulted in increased screen media use.²⁵ The amount of screen time has changed over time, with the increased use of smart phones and screen-based games in addition to TV, video, and computer use.²⁶ In the past, excess screen time was often defined by 2 or more hours of noneducational screen use, which would include 92% of teens in the 2021–22 NHIS-Teen.^{24,27} Given the widespread prevalence of 2 or more hours of screen time, we looked at a cutoff of 4 or more hours of screentime. Our data showed that among teens without ADHD, half reported spending 4 or more hours daily using screen media, and among teens with ADHD, almost 2 in 3 exceeded 4 or more hours, which is likely to affect overall health activities.⁵ Screen time has multiple functions, such as entertainment, social interaction, exploration, and learning; however, screen time is generally sedentary, can affect other positive activities such as sleep or physical activity and thus can affect physical health negatively.²⁴ Screen use and ADHD symptoms are interrelated; excess screen time may exacerbate ADHD symptoms, but teens with ADHD may also engage more with screens.²⁶ We did not find differences in physical activity, which has been noted as lower among children with ADHD⁷ but can vary depending on how physical activity is assessed.²⁸

Limitations

This study has several limitations. First, the study design was cross-sectional; therefore, the associations between ADHD, social-emotional well-being, and health behaviors examined in the study cannot be used to draw causal inferences. Second, ADHD diagnoses were based on parent report of a health care provider diagnosis and have not been validated against medical records, which may have resulted in misclassification. Third, health behavior and well-being measures were reported by the teenagers; they may not reflect the same measures that would be reported by parents or directly observed. Fourth, while the NHIS-Teen includes questions on a variety of factors related to health behaviors and social-emotional well-being, it does not include questions on items such as sleep duration and size of friend group that may influence the association between having an ADHD diagnosis and the health behaviors and social-emotional well-being outcomes of interest. Fifth, due to limitations in sample size and statistical power, we were unable to detect significant differences for some findings. Sixth, there is a small yet significant bias after weighting adjustments, including an underrepresentation of teens with ADHD in the NHIS-Teen sample.²⁹

In addition, we were not able to examine the prevalence and differences for co-occurring disorders (e.g., mental, emotional, or behavioral conditions) that may play a role in the social-emotional well-being and health-related factors we considered. It was not possible to determine whether the reported associations with ADHD overall were consistent for

individuals with ADHD alone and those with co-occurring disorders. Related, we were unable to examine differences in prevalence and examine the use of ADHD medications or behavioral therapies to assess their role in impacting the overall pattern of findings due to lack of ADHD treatment questions on the surveys.

Furthermore, our sample size did not provide enough power to examine demographic differences, such as age, sex, or race and ethnicity by individual health behavior and well-being factors. Both ADHD prevalence and experience and self-report of social and emotional factors can be influenced by sex, for example.^{2,17} Finally, as expected from other studies, our sample of teens with ADHD diagnosis was significantly more often male, older, and more often White non-Hispanic than teens without ADHD.²⁰ Demographic differences including gender, age, and race or ethnicity can influence whether a child receives an ADHD diagnosis; therefore, our findings represent teens with diagnosed ADHD but may not be generalizable to teens with undiagnosed ADHD.

Implications and Future Directions

This study's findings have several implications for public health. In our study, many teens with and without ADHD reported sleep problems, high levels of screen time use, and mental health difficulties. As discussed, teens with ADHD were more likely to have difficulties across several health behavior and well-being domains compared with teens without ADHD, including having difficulty making friends, experiencing bullying victimization, reporting sleep problems, and engaging in high daily screen time. Future public health research could explore the interrelation among these factors. Parent-reported healthy lifestyle factors of teens with ADHD (e.g., screen time limits, adequate sleep, and daily physical activity) have been found to be protective against peer difficulties and bullying among teenagers,⁵ but research is limited on teen self-report of healthy lifestyle factors regarding their peer relationships and social-emotional well-being. By using data drawn from a teen perspective, this study sheds light on important concerns for teens with ADHD, including different measures of social and emotional well-being and health behaviors. Future work could continue looking at these factors and how teens' access to care, medications, and therapies affect these outcomes.

It has been recommended that health care providers such as pediatricians and schools can support teens with and without ADHD to have healthy and active lifestyles, including media and screen use.²⁴ CDC's Whole School, Whole Community, Whole Child approach³⁰ describes the importance of integrating a range of health factors including social and emotional climate, physical health, mental and physical health services, among others, as well as having families and communities work together with schools to support teen development and health.³⁰ Health care providers have an opportunity to assess teens for engagement in health-related behaviors and address those if warranted.³¹ Behavioral interventions to support healthy sleep, for example, have been shown to be effectively delivered to children with ADHD by health care providers.³² Our results represent a step toward informing opportunities for public health interventions to decrease the negative health effects of ADHD and encourage healthy habits among teenagers with ADHD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Description of Teen-Reported Lifestyle Factor Variables Included in the Analyses, National Health Interview Survey-Teen, July 2021–December 2022

Lifestyle Factors	Description
Social-emotional well-being	
Friendship	
Difficulty making friends	Response of a lot of difficulty or cannot do at all to how much difficulty they have making friends
Lack of support	
Lack of social and emotional support	Response of sometimes, rarely, or never getting the social and emotional support they need
Lack of peer support	Response of some, a little, or not at all to how much they can rely on friends for help if they have a serious problem and how much they can open up to friends if they need to talk about their worries
Lack of parent support	Response of some, a little, or not at all to how much they can rely on parents or guardians for help if they have a serious problem and how much they can open up to a parent or guardian if they need to talk about their worries
Lack of community support	Response of no to if there is at least 1 adult, other than parents or adults living in their home, that makes a positive and meaningful difference in their life
Bullying	
Bullying victimization	Response of 1–2 times in the past 12 mo, 1–2 times per month, 1–2 times per week, or almost every day during the past 12 mo to how often they have been bullied, picked on, or excluded by other children or teenagers
Bullying perpetration	Response of 1–2 times in the past 12 mo, 1–2 times per month, 1–2 times per week, or almost every day during the past 12 mo to how often they bully, pick on, or exclude others
Mood disorder symptoms	
Depression symptoms	Defined by a combined score of 3 or more based on answers to the 2 question items known as the Patient Health Questionnaire-2 (PHQ-2). PHQ-2 questions, “Over the last two weeks, how often have you been bothered by having little interest or pleasure in doing things?” and “Over the last two weeks, how often have you been bothered by feeling down, depressed or hopeless?”. Response options were “Not at all; Several days; More than half the days; Nearly every day” with scores assigned 0, 1, 2, or 3, respectively
Anxiety symptoms	Defined by a combined score of 3 or more based on answers to the 2 question items known as the Generalized Anxiety Disorder (GAD-2). GAD-2 questions, “Over the last two weeks, how often have you been bothered by feeling nervous, anxious, or on edge?” and “Over the last two weeks, how often have you been bothered by not being able to stop or control worrying?”. Response options were “Not at all; Several days; More than half the days; Nearly every day” with scores assigned 0, 1, 2, or 3, respectively
Any depression/anxiety symptoms	Composite of “depression symptoms” or “anxiety symptoms”
Life satisfaction	
Low life satisfaction	Response of 4 or lower to how satisfied they feel about their life as a whole these days, on an 11-point (0–10) scale
Mental health treatment needs	
Any unmet mental health treatment needs (<i>Cost, stigma, access</i>)	Composite based on answers to 3 measures: any time when they needed counseling or therapy from a mental health professional, but did not get it because of cost, they were afraid of what others would think of them, or they didn’t know where to go or how to get help in the past 12 mo
Health behaviors	
Sleep	
Not well rested	Response of some days or never for how often they wake up well rested

Lifestyle Factors	Description
Difficulty getting up	Response of most days or every day for how often they have difficulty getting out of bed
Tired	Response of most days or every day for how often they feel tired during the day
Naps and falls asleep	Response of most days or every day for how often they nap or fall asleep during the day
Any sleep quality concerns	Composite based on being “not well rested,” “difficulty getting up,” “tired,” or “naps and falls asleep”
No regular bedtime	Response of some days or never to how often they go to bed at the same time
No regular waketime	Response of some days or never to how often they wake up at the same time
Any sleep regularity concerns	Composite based on “not having a regular bedtime” or “not having a regular waketime”
Any sleep problems	Composite based on “any sleep quality concerns” composite and “any sleep regularity concerns” composite
Screen time	
Weekday screen time > 4 hr, not counting schoolwork	Response of 4 or more hours of time on most weekdays in front of a TV, computer, cellphone, or other electronic device watching programs, playing games, accessing the Internet, or using social media (Do not include time spent doing schoolwork)
Physical activity	
Daily exercise < 60 min daily	Response of most days, some days or never for how often they participate in exercise, play a sport, or participate in physical activity for at least 60 min a day
Concern about weight	
Weight perceived as too high or too low	Response of too high or too low for concerned about their weight

Table 2.

Weighted Percentages of Teens (Ages 12–17 Years) With and Without Current ADHD, by Demographic Characteristics, National Health Interview Survey–Teen, July 2021–December 2022

Demographic Characteristics	Teens With ADHD ^a (n = 120) % (95% CI)	Teens Without ADHD (n = 1049) % (95% CI)	<i>p</i> ^b
Overall	10.4 (8.2–12.9)	89.6 (87.1–91.8)	
Sex			
Male	64.4 (53.2–74.5)	49.7 (45.7–53.6)	6.63 ^c (<i>p</i> = 0.01)
Female	35.6 (25.5–46.8)	50.3 (46.4–54.3)	
Age group			
12–14 yr	38.5 (27.7–50.2)	51.3 (47.4–55.1)	4.59 ^c (<i>p</i> = 0.03)
15–17 yr	61.5 (49.8–72.3)	48.7 (44.9–52.6)	
Race and Hispanic origin			
Non-Hispanic white	66.8 (55.4–76.9)	50.1 (46.2–53.9)	8.01 ^c (<i>p</i> = 0.005)
Hispanic and all other races ^d	33.2 (23.1–44.6)	49.9 (46.1–53.8)	
Highest parental education attainment			
High school or less	15.9 (7.9–27.3)	26.2 (22.6–30.1)	1.81 (<i>p</i> = 0.17)
Some college	31.5 (20.9–43.8)	25.8 (22.5–29.4)	
College degree or higher	52.6 (40.6–64.4)	48.0 (44.0–52.0)	
Family income relative to federal poverty level (FPL) ^e			
<200% FPL	34.0 (22.6–45.4)	36.2 (32.1–40.2)	0.06 (<i>p</i> = 0.94)
≥200% FPL <400%	28.9 (26.2–47.9)	28.1 (24.6–31.7)	
≥400% FPL	37.0 (26.2–47.9)	35.7 (32.1–39.3)	

^aBased on parent report of yes to whether a doctor or other health professional ever told them that the child has ADHD or attention deficit disorder (ADD), and if yes, whether the child currently has ADHD or ADD.

^b*p* value calculated by using the Wald χ^2 test.

^cSignificant at *p* < 0.05.

^dAll other races include teens who are Black/African American, American Indian, Alaska Native, Native Hawaiian, Other Pacific Islander, Asian, some other race, or multiple races.

^eMultiple imputation was used to estimate values for respondents with missing data on indicators used to calculate poverty status (data were imputed for 10.8% of respondents represented in this table, information on imputation available at https://www.cdc.gov/NHISDataQueryTool/NHIS_teen/index.html).

Table 3.

Prevalence of Lifestyle Factors by ADHD Diagnoses With Adjusted Prevalence Ratios^a, National Health Interview Survey-Teen, July 2021–December 2022

Lifestyle Factors	Teens With ADHD (n = 120) % (95% CI)	Teens Without ADHD (n = 1049) % (95% CI)	Adj. PR ^a (95% CI)
Social-emotional well-being			
Friendship			
Difficulty making friends	23.6 (14.0–35.6)	13.3 (10.7–16.3)	1.83 ^b (1.15–2.90)
Lack of support			
Lack social and emotional support	43.5 (31.9–55.6)	41.3 (37.6–45.1)	1.09 (0.83–1.44)
Lack peer support	35.7 (24.9–47.7)	51.5 (47.4–55.6)	0.70 ^b (0.51–0.96)
Lack parent support	43.4 (31.4–56.1)	35.1 (31.4–39.0)	1.29 (0.97–1.71)
Lack community support	15.9 (7.9–27.3)	19.8 (16.7–23.3)	0.82 (0.46–1.47)
Bullying			
Bullying victimization	49.1 (37.5–60.9)	31.6 (27.9–35.5)	1.64 ^b (1.27–2.11)
Bullying perpetration	14.4 (7.6–23.9)	15.8 (13.2–18.7)	0.93 (0.55–1.56)
Mood disorder symptoms			
Any depression or anxiety symptoms	30.4 (20.5–41.9)	26.7 (23.2–30.5)	1.21 (0.84–1.74)
Depression symptoms	21.2 (12.5–32.2)	17.0 (14.1–20.3)	1.32 (0.82–2.12)
Anxiety symptoms	20.7 (12.9–30.4)	21.2 (18.1–24.6)	1.05 (0.69–1.59)
Life satisfaction			
Low life satisfaction	10.4 (5.2–18.2)	5.9 (4.2–7.9)	1.93 (1.00–3.74)
Mental health treatment needs			
Any unmet mental health treatment needs (Cost, stigma, access)	12.7 (7.0–20.8)	21.1 (17.9–24.5)	0.69 (0.41–1.16)
Health behaviors			
Sleep			
Any sleep problems	79.9 (70.1–87.6)	69.1 (65.1–72.8)	1.17 ^b (1.05–1.31)
Any sleep quality concerns	69.8 (57.4–80.3)	64.3 (60.2–68.2)	1.11 (0.94–1.31)
Not well rested	57.7 (45.6–69.1)	48.5 (44.6–52.4)	1.20 (0.96–1.49)
Difficulty getting up	50.2 (38.6–61.8)	40.2 (36.4–44.1)	1.29 ^b (1.02–1.64)
Tired	42.6 (31.4–54.3)	38.7 (34.9–42.6)	1.17 (0.90–1.52)

Lifestyle Factors	Teens With ADHD (n = 120) % (95% CI)	Teens Without ADHD (n = 1049) % (95% CI)	Adj. PR ^a (95% CI)
Naps/falls asleep	20.2 (12.2–30.5)	16.4 (13.8–19.4)	1.28 (0.81–2.03)
Any sleep regularity concerns	45.5 (34.3–57.1)	36.2 (32.6–40.0)	1.28 (0.99–1.64)
No regular bedtime	29.8 (20.3–40.8)	32.4 (28.9–36.1)	0.93 (0.65–1.32)
No regular waketime	29.0 (18.5–41.3)	14.0 (11.3–17.1)	2.17 ^b (1.45–3.25)
Screen time			
Weekday screen time ≥ 4 hr, not including school work	63.6 (51.7–74.5)	50.0 (46.2–53.8)	1.26 ^b (1.05–1.52)
Physical activity			
Daily exercise < 60 min daily	75.5 (64.5–84.5)	74.3 (70.7–77.7)	1.02 (0.90–1.16)
Concern about weight			
Weight perceived as too high or too low	29.4 (19.5–40.9)	33.2 (29.6–37.0)	0.94 (0.67–1.33)

^aPrevalence ratios were adjusted by teen's age, sex, and family income (imputed income data files were used).

^bSignificant at $p < 0.05$.

ADHD, attention-deficit/hyperactivity disorder; CI, confidence interval; PR, prevalence ratio.