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## Chronic School Absenteeism Among Children With Selected Developmental Disabilities: National Health Interview Survey, 2014–2016

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### Abstract

**Objectives**—This report describes associations between chronic school absenteeism and selected developmental disabilities (DDs) among school-aged children.

**Methods**—Using the 2014–2016 National Health Interview Survey, multivariate logistic regression models were fit to estimate the association between DDs (attention-deficit/hyperactivity disorder [ADHD], autism spectrum disorder, intellectual disability, or other developmental delay) and chronic school absenteeism controlling for demographics and co-occurring physical health conditions among children aged 5–17 years.

**Results**—During 2014–2016, the overall prevalence of ADHD was 10.6%, autism spectrum disorder was 2.5%, intellectual disability was 1.3%, and other developmental delay was 3.8% among children aged 5–17 years. Children with some types of DDs examined had significantly higher odds of chronic absenteeism compared with children who did not have a DD. Specifically, children with ADHD (adjusted odds ratio [AOR]: 1.84; 95% confidence interval [CI]: 1.16–2.91), autism spectrum disorder (AOR: 2.89; 95% CI: 1.59–5.27), and intellectual disability (AOR: 1.57; 95% CI: 1.03–2.39) were more likely to have had chronic school absenteeism than children without these conditions.

**Conclusions**—Children with DDs had higher chronic school absenteeism. Associations remained after controlling for demographics and co-occurring physical health conditions. Similarly as the number of DDs increased, the odds of chronic school absenteeism increased. These findings show that both the type and number of DDs are associated with school attendance.

**Keywords:** children • developmental delay • missed school days • ADHD

### Introduction

In the United States, 14% of all public school students are chronically absent from school, missing 15 or more days per year (1). Chronic school absenteeism has been associated with poor academic performance, poor school engagement, and greater school dropout (2,3). Previous research has also found that children with chronic health conditions are more likely to have suboptimal school achievement, such as an inability to complete high school or obtain a GED, when compared with youth who did not have a chronic health condition (4). Past research has explored associations between school attendance and health conditions; however, studies have been limited in size and were not nationally representative (5,6). Further, many studies focused on chronic physical health conditions and few explored relationships for individual developmental disabilities (DDs) (7). This report examines the association between selected DDs and chronic school absenteeism among children aged 5–17 years using the National Health Interview Survey (NHIS).



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## Methods

Data are from the 2014–2016 NHIS, conducted by the National Center for Health Statistics (NCHS). NHIS is a nationally representative survey of the civilian noninstitutionalized population ([https://www.cdc.gov/nchs/nhis/about\\_nhis.htm](https://www.cdc.gov/nchs/nhis/about_nhis.htm)). Households are sampled and selected to be interviewed in person by trained U.S. Census Bureau interviewers. Within each household, families are identified and complete a brief questionnaire to collect selected demographics and broad health measures. Additionally, one adult and one child are randomly selected to receive a more detailed health questionnaire. A parent or guardian answers the sample child questionnaire on behalf of the child. Between 2014 and 2016, the response rate for the sample child component ranged from 63.4% to 67.1%, and in 91.0% of cases, the respondent for the child was the child's parent.

Children aged 5–17 years were included in this study. Children who did not attend school or had missing values for the survey variables of interest (2.0%) were excluded from analysis. DDs were categorized based on responses to a series of survey questions that asked whether the parent had ever been told by a doctor or health professional that the child had attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder, intellectual disability, or other developmental delay. School absenteeism was categorized based on the survey question, “During the past 12 months, about how many days did (sample child) miss school because of illness or injury?” Responses of 15 or more days were categorized as chronic school absenteeism based on the U.S. Department of Education definition (8).

The weighted percentage of children who had chronic school absenteeism as calculated among each of the selected DD groups. Separate unadjusted logistic regressions for each of the selected DDs as the dependent variable (and chronic absenteeism was the outcome) as calculated. Multivariate logistic regressions were also used to assess the association between children with selected DDs and chronic school absenteeism, adjusted by

co-occurring physical health conditions, which included asthma, allergies, and headaches, and demographics including age, sex, race and ethnicity, poverty status, family structure (categorized as two parent, single parent, or other), and geographical region of residence (Northeast, Midwest, South, and West). Because many children diagnosed with one DD are typically diagnosed with one or more additional DDs (9), models were adjusted for all other selected DDs. Further, a separate multivariate logistic regression was used to examine the association of the number of co-occurring DDs (categorized as 0, 1, 2, 3, or more) and chronic school absenteeism, adjusted by previously examined demographics and other physical health conditions. All analyses used complex sample design variables and weights, which allowed for the calculation of nationally representative estimates. Analyses were conducted using SUDAAN version 11.0 to account for the complex sample design.

## Results

Using data from the 2014–2016 NHIS, 26,458 children aged 5–17 years were eligible for study inclusion; among these, 3,795 (unweighted) children had a DD. **Table 1** describes the sample and shows the prevalence of ADHD, autism spectrum disorder, intellectual disability, and other developmental delay by selected characteristics. The prevalence of ADHD was 10.6%, autism spectrum disorder was 2.5%, intellectual disability was 1.3%, and other developmental delay was 3.8% (**Table 1**). Children with an intellectual disability had the highest prevalence of chronic school absenteeism (14.0%) followed by children with autism spectrum disorder (9.0%), other developmental delay (7.2%), and ADHD (5.2%) (**Table 2**). The unadjusted odds ratios show that children with each of the DDs examined, including intellectual disability (unadjusted odds ratio [OR]: 6.22; 95% confidence interval [CI]: 3.82–10.14), autism spectrum disorder (OR: 3.77; 95% CI: 2.55–5.58), other developmental delay (OR: 3.00; 95% CI: 2.15–4.17), and ADHD (OR: 2.25; 95% CI: 1.75–2.88) were more likely to have had chronic school absenteeism when

compared with children without these conditions. In multivariable analysis, the adjusted odds were attenuated but most remained significant. Children with an intellectual disability (adjusted odds ratio [AOR]: 1.57; 95% CI: 1.03–2.39), autism spectrum disorder (AOR: 2.89; 95% CI: 1.59–5.27), and ADHD (AOR: 1.84; 95% CI: 1.16–2.91) remained more likely to have had chronic school absenteeism than children without these conditions, after controlling for selected demographics and other physical health conditions (**Table 2**). AORs for children with other developmental delay (AOR: 1.24; 95% CI: 0.93–1.65) did not reach statistical significance, but the direction of the results was consistent with the other DDs. Additional analyses indicated that as the number of DDs a child had increased, the odds for chronic absenteeism increased. Children with only one DD (AOR: 1.96; 95% CI: 1.53–2.52), children with two DDs (AOR: 2.26; 95% CI: 1.33–3.84), and children with three or more DDs (AOR: 6.08; 95% CI: 2.92–12.66) were more likely to have had chronic school absenteeism compared with children without a DD (**Table 3**).

## Conclusions

In this nationally representative sample of children aged 5–17 years, children with ADHD, autism spectrum disorder, and intellectual disability were more likely to have had chronic school absenteeism compared with children who did not have these conditions even after controlling for demographic and selected physical health conditions. Similarly, as the number of DDs increased, the odds of chronic school absenteeism increased. These findings show that both the type and number of DDs are associated with school attendance.

This study is not without limitations. First, data are based on a parent or guardian report. Measures of school absenteeism may be an underestimate due to social desirability bias, and determination of DDs and physical health conditions are dependent on parents' understanding and willingness to report them. Further, school enrollment was not directly assessed, and therefore responses of “did not go to school” could include both children with extreme sickness who

were unable to attend school as well as children who were not enrolled in school. Additionally, selected DDs were based on a lifetime diagnosis, and therefore children whose condition may have changed over time may be misclassified. Data are cross-sectional, and so it is not possible to infer temporality. Lastly, it is possible that the associations observed may be due to other confounding factors that could not be measured in NHIS.

Chronic school absenteeism may be increased among children with DDs compared with children without DDs. In general, chronic school absenteeism may negatively impact long-term educational achievement (5), and this effect could be increased among children with DDs. Moreover, children with DDs may also have co-occurring physical or behavioral health conditions, leading to a higher need for services rendered under an Individualized Education Program (10,11), particularly mental health services (12). These findings may inform other research on the potential relationship with, and impact of, DDs among children and school absenteeism.

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**Table 1. Weighted prevalence of selected developmental disabilities among U.S. children aged 5–17 years, by selected characteristics, 2014–2016**

Selected characteristic	ADHD		Autism spectrum disorder		Intellectual disability		Other developmental delay	
	Sample size	Percent	Sample size	Percent	Sample size	Percent	Sample size	Percent
Total	2,833	10.6	637	2.5	347	1.3	1,042	3.8
Age group								
5–10	956	8.2	274	2.5	108	0.9	514	4.4
11–13	727	12.1	163	2.8	109	1.7	232	3.5
14–17	1,150	13.0	200	2.3	130	1.4	296	3.1
Sex								
Male	1,962	14.6	487	3.8	198	1.6	650	4.7
Female	871	6.5	150	1.2	149	0.9	392	2.9
Race and Hispanic origin								
Non-Hispanic white	1,708	12.6	373	2.9	171	1.2	622	4.5
Non-Hispanic black	438	12.6	75	2.3	54	1.5	108	3.2
Hispanic	455	6.2	120	1.7	95	1.4	199	2.9
Non-Hispanic other	232	7.8	69	2.5	27	1.0	113	3.5
Family income								
Less than 100% FPL	647	13.0	127	2.6	97	2.0	247	4.7
100% to less than 200% FPL	699	11.0	172	3.0	93	1.4	253	3.9
200% to less than 400% FPL	760	9.6	178	2.3	72	0.8	287	3.7
400% or more FPL	727	9.5	160	2.2	85	1.1	255	3.2
Family structure								
Two parent	1,481	8.9	368	2.3	182	1.0	596	3.5
Single parent	1,133	13.5	232	2.7	143	1.7	388	4.5
Other	219	20.0	37	4.3	22	2.4	58	5.0
Region								
Northeast	506	10.9	128	3.0	59	1.3	223	4.8
Midwest	634	12.3	133	2.5	69	1.3	223	4.6
South	1,144	11.8	212	2.4	124	1.3	329	3.5
West	549	6.8	164	2.3	95	1.1	267	2.8
Other physical health conditions in the past 12 months								
Allergy <sup>1</sup>	1,026	14.2	268	3.7	153	1.9	465	5.8
Asthma <sup>2</sup>	486	17.0	447	4.6	58	2.2	179	6.0
Frequent headaches or migraines	355	20.2	77	4.9	41	2.6	131	6.9

<sup>1</sup>Based on the questions, "During the past 12 months, has (child's name) had any of the following conditions? Hay fever? Any kind of respiratory allergy? Any kind of food or digestive allergy? Eczema or any kind of skin allergy?" A child may be counted in more than one category.

<sup>2</sup>Based on affirmative responses to both questions, "Has a doctor or other health professional ever told you that (child's name) had asthma?" and "Does (child's name) still have asthma?"

NOTES: Developmental disability conditions are not mutually exclusive; children can have more than one of the selected developmental disabilities. ADHD is attention-deficit/hyperactivity disorder. FPL is federal poverty level.

SOURCE: NCHS, National Health Interview Survey, 2014–2016.

**Table 2. Weighted prevalence and odds ratio of chronic school absenteeism among U.S. children aged 5–17 years, by selected developmental disability, 2014–2016**

Developmental disability	Prevalence of chronic absenteeism (95% CI)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio <sup>1</sup> (95% CI)
ADHD . . . . .	5.2 (4.2–6.5)	2.25 (1.75–2.88)	1.84 (1.16–2.91)
Autism spectrum disorder . . . . .	9.0 (6.1–12.6)	3.77 (2.55–5.58)	2.89 (1.59–5.27)
Intellectual disability . . . . .	14.0 (8.8–20.9)	6.22 (3.82–10.14)	1.57 (1.03–2.39)
Other developmental delay . . . . .	7.2 (5.2–9.6)	3.00 (2.15–4.17)	1.24 (0.93–1.65)

<sup>1</sup>Controls for other developmental disabilities of either ADHD, autism spectrum disorder, intellectual disability, other developmental delay, other physical health conditions in the past 12 months (allergy, asthma, frequent headaches, or migraines), age group, sex, race and Hispanic origin, family income, family structure, and region of residence.

NOTES: Survey sample size was 26,458. CI is confidence interval. ADHD is attention-deficit/hyperactivity disorder.

SOURCE: NCHS, National Health Interview Survey, 2014–2016.

**Table 3. Weighted prevalence and odds ratio of chronic school absenteeism among U.S. children aged 5–17 years, by number of selected developmental disabilities**

Number of developmental disability conditions, lifetime	Prevalence of chronic absenteeism (95% CI)	Adjusted odds ratio <sup>1</sup> (95% CI)
No developmental disability . . . . .	2.1 (1.9–2.4)	1.00 (reference)
One developmental disability . . . . .	5.2 (4.3–6.2)	1.96 (1.53–2.52)
Two developmental disability . . . . .	7.4 (4.6–11.6)	2.26 (1.33–3.84)
Three or more developmental disability . . . . .	16.7 (9.7–27.3)	6.08 (2.92–12.66)

<sup>1</sup>Controls for other physical health conditions in the past 12 months (allergy, asthma, frequent headaches, or migraines), age group, sex, race and Hispanic origin, family income, family structure, and region of residence.

NOTE: CI is confidence interval.

SOURCE: NCHS, National Health Interview Survey, 2014–2016.

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