

Chronic School Absenteeism and the Role of Adverse Childhood Experiences

Hilary Stempel, MD, MPH; Matthew Cox-Martin, PhD; Michael Bronsert, PhD, MS; L. Miriam Dickinson, PhD; Mandy A. Allison, MD, MSPH

From the University of Colorado at Denver–Anschutz Medical Campus, Adult and Child Consortium for Health Outcomes Research and Delivery Science (Drs Stempel, Cox-Martin, Bronsert, Dickinson, and Allison), Department of Pediatrics, Children’s Hospital Colorado (Drs Stempel and Allison), and Department of Family Medicine, University of Colorado Denver (Dr Dickinson), Aurora, Colo

The authors have no conflicts of interest to disclose.

Address correspondence to Hilary Stempel, MD, MPH, General Academic Pediatrics, Mail Stop F443, 13199 E Montview Blvd, Suite 300, Aurora, CO 80045 (e-mail: hilary.stempel@ucdenver.edu).

Received for publication February 19, 2017; accepted September 15, 2017.

ABSTRACT

OBJECTIVE: To examine the association between chronic school absenteeism and adverse childhood experiences (ACEs) among school-age children.

METHODS: We conducted a secondary analysis of data from the 2011–2012 National Survey of Children’s Health including children 6 to 17 years old. The primary outcome variable was chronic school absenteeism (≥ 15 days absent in the past year). We examined the association between chronic school absenteeism and ACEs by logistic regression with weighting for individual ACEs, summed ACE score, and latent class analysis of ACEs.

RESULTS: Among the 58,765 school-age children in the study sample, 2416 (4.1%) experienced chronic school absenteeism. Witnessing or experiencing neighborhood violence was the only individual ACE significantly associated with chronic absenteeism (adjusted odds ratio [aOR] 1.55, 95% confidence interval [CI] 1.20–2.01). Having 1 or more ACE was signifi-

cantly associated with chronic absenteeism: 1 ACE (aOR 1.35, 95% CI 1.02–1.79), 2 to 3 ACEs (aOR 1.81, 95% CI 1.39–2.36), and ≥ 4 ACEs (aOR 1.79, 95% CI 1.32–2.43). Three of the latent classes were also associated with chronic absenteeism, and children in these classes had a high probability of endorsing neighborhood violence, family substance use, or having multiple ACEs.

CONCLUSIONS: ACE exposure was associated with chronic school absenteeism in school-age children. To improve school attendance, along with future graduation rates and long-term health, these findings highlight the need for an interdisciplinary approach to address child adversity that involves pediatricians, mental health providers, schools, and public health partners.

KEYWORDS: adverse childhood experiences; child development; school absenteeism

ACADEMIC PEDIATRICS 2017;17:837–843

WHAT’S NEW

Chronic school absenteeism is common among school-age children who witness neighborhood violence, live with family members using substances, or have multiple adverse childhood experiences (ACEs). Pediatricians have a role to ask and address concerning attendance patterns and ACEs.

IN THE UNITED States, nearly 14% of school-age children are chronically absent from school each year.¹ Chronic absenteeism is defined as missing 15 or more days, either excused or unexcused, during a single school year.¹ Students who are chronically absent miss critical learning opportunities,^{2–4} and chronic absenteeism is a better predictor of school dropout than low grades or poor standardized test scores.² Literature shows that youth who drop out from school experience higher levels of chronic diseases, substance abuse, mental health concerns, and early death.^{5,6} Pediatricians routinely discuss school performance at well-child checks and are uniquely

positioned to identify children with concerning attendance patterns and provide timely anticipatory guidance to support learning and healthy development across the life span.

Pediatricians consider children’s development in the context of their individual health as well as home, school, and greater community environment. The ecological framework provides a context for this comprehensive approach to assess and identify challenges to children’s school attendance. The ecological framework places the individual at the center and sets to explain how an individual’s behavior is in response to interactions at distal levels.⁷ Starting at the individual level, it is known that children with special health care needs⁸ and poorer health³ often have difficulty attending school regularly. Children with mental health difficulties, such as depression or anxiety, are known to avoid school.⁶ Moving outward from the child to the home environment, it is known that children living with parental substance use, family conflict, and in poverty³ struggle with school attendance.⁶ Extending further to the community level, poorly rated school climate and unsafe neighborhoods also negatively affect school attendance.^{3,9}

The American Academy of Pediatrics has called for pediatric practices to screen for social determinants and toxic stress, such as adverse childhood experiences (ACEs), which can negatively affect children's development.^{10,11} ACEs, defined as traumatic events in childhood related to abuse, neglect, and household dysfunction, are common, with 48% of children experiencing at least one ACE.¹² Children experiencing ACEs are more likely to have poor school performance,^{13,14} be less engaged in school, and repeat a grade in school.¹² Chronic absenteeism may be a mechanism by which ACEs affect success in school. For example, parental substance use and neighborhood violence are known risk factors for school absenteeism.^{6,15} Because pediatricians are beginning to screen for some ACEs,¹⁶ we aimed to further explore the relationship between ACEs and school attendance. Understanding this relationship in the context of an ecological framework could guide pediatricians' anticipatory guidance regarding school performance.

Several factors known to influence absenteeism are asked about in the ACE questions, yet little research has explored to assess whether ACEs affect children's school attendance. Therefore, we conducted a study using the National Survey of Children's Health (NSCH)¹⁷ to determine if an association between ACEs and chronic absenteeism exists, and if such an association persists after controlling for known sociodemographic and health status predictors of absenteeism.

METHODS

STUDY POPULATION AND DESIGN

We used the 2011–2012 NSCH, a nationally representative telephone survey, for our analysis.¹⁷ The survey was conducted by the National Center for Health Statistics and is sponsored by the Maternal and Child Health Bureau. Detailed information on methodology and survey design has been published elsewhere.¹⁸ Parents or caregivers provide child-level data by responding to questions in relation to one of their children (aged 0–17 years).

PRIMARY OUTCOME VARIABLE

School absenteeism was measured by asking parents, "During the past 12 months, about how many days of school did your child miss because of illness or injury?" This question was used in the 2003 and 2007 versions of

the NSCH.¹⁹ We dichotomized school absenteeism into 2 categories: missing <15 days per year, or missing \geq 15 days per year. We chose to dichotomize the variable, and we use the cutoff of 15 days of missed school to be consistent with the US Department of Education Office of Civil Rights definition of chronic absenteeism.¹

PREDICTOR VARIABLE

Because there is not yet consensus in the literature as to the best way to measure ACEs,^{20–22} we used 3 methods to analyze ACEs: 1) individual ACEs, 2) summed ACE score (0, 1, 2–3, \geq 4), and 3) ACEs classes from a latent class analysis. In the NSCH, parents answered 9 questions about psychosocial risk factors affecting their child (Table 1). These questions were decided on by a technical expert panel and included 5 questions from the original Centers for Disease Control and Prevention ACEs study and 4 additional childhood stressors questions querying about death of parent, neighborhood violence, racial/ethnic discrimination, and socioeconomic hardships. The first ACE question was considered positive if answered "somewhat often" or "very often." All other questions were binary yes/no questions.¹⁹

SOCIODEMOGRAPHIC COVARIATES

We included sociodemographic characteristics as covariates that demonstrated an association with school attendance in the published literature.^{3,6,23,24} Child-level variables included the child's age, race/ethnicity, household income based on federal poverty level, parent's perception of child's overall health, maternal education level, and children with special health care needs (CSHCN) health designation. Age was categorized to align with grade level: 6 to 10 years for elementary school, 11 to 14 years for middle school, and 15 to 17 years for high school. Race/ethnicity was grouped into 4 categories: white, non-Hispanic; black, Non-Hispanic; Hispanic; and multiracial/other, non-Hispanic. Household income groups were grouped on the basis of percentage of the federal poverty level: \leq 200%, 201% to \leq 399%, and \geq 400% federal poverty level. Parent's perception of child's overall health was classified as excellent/very good, good, and fair/poor. Maternal education level was categorized as less than high school education, high school graduate, or more than high school. A standardized 5-question CSHCN screener, developed and validated by Bethell et al,²⁵ was used for CSHCN designation. All questions queried that the condition or

Table 1. Adverse Childhood Experiences Questions From National Survey of Children's Health

1. How often has it been hard to get by on your family's income—hard to cover basics like food or housing?
2. Did [SC] ever live with a parent or guardian who got divorced or separated after [SC] was born?
3. Did [SC] ever live with a parent or guardian who died?
4. Did [SC] ever live with a parent or guardian who served time in jail or prison after [SC] was born?
5. Did [SC] ever see or hear any parents, guardians, or any other adults in [his/her] home slap, hit, kick, punch, or beat each other up?
6. Was [SC] ever the victim of violence or witnessed any violence in [his/her] neighborhood?
7. Did [SC] ever live with anyone who was mentally ill or suicidal, or severely depressed for more than a couple of weeks?
8. Did [SC] ever live with anyone who had a problem with alcohol or drugs?
9. Was [SC] ever treated or judged unfairly because of [his/her] race or ethnic group?

SC indicates sample child.

need for services lasted or was expected to last at least 12 months.

STATISTICAL ANALYSIS

Complex survey design was used in all analyses by applying sample weights and strata to reflect nationally representative totals of noninstitutionalized children in the United States.²⁶ First, descriptive statistics were used to summarize relevant sociodemographic characteristics and individual ACEs. Next, we performed multivariable logistic regression for the 3 methods of analyzing ACEs: 1) individual ACEs, 2) ACE score (0, 1, 2–3, ≥ 4), and 3) ACEs classes from a latent class analysis (described below). All logistic regression analyses were performed using the same primary outcome variable: missing 15 or more days of school during the prior school year.

LATENT CLASS ANALYSIS

Latent class analysis is a modeling technique to examine how participants' responses group together based on their statistical relationships. Using Mplus v7.4 (<https://www.statmodel.com/>), we analyzed the probability that a survey respondent answers yes to each of the 9 ACE questions.¹⁹ This method uses a missing at random technique to account for missing values when a respondent answered some, but not all, of the ACE questions. We tested 5 models that grouped the probabilities for survey respondents to answer yes to certain ACE questions into 2 to 6 classes. To select the final model, we tested and examined each model using methods outlined by Collins and Lanza.²⁷ The final number of latent classes was selected using theory and 5 fit indices measurements (Online Appendix Table). The fit indices included adjusted the Bayesian information criterion and Akaike information criterion, where lower values represent better fit; entropy, where values closer to 1 represent a better fit; and 2 likelihood ratio tests, where significant *P* values represent better fit.

We used Mplus to conduct the latent class analysis. R with R Studio (R Foundation for Statistical Computing, Vienna, Austria; <http://www.r-project.org/>) was used for all other analyses. The packages “qwraps2” v0.2.1 and “survey” v3.31 were used to analyze and output the data. The Colorado Multiple Institution Review Board determined this study to be exempt from human subject review.

RESULTS

DESCRIPTION OF STUDY SAMPLE

The student sample of 58,765 subjects included all school-age children between ages 6 and 17 years who were enrolled in school and whose parents answered at least 1 of the 9 ACE questions. Children were excluded for the following reasons: missing school status (*n* = 400, 0.4%), being homeschooled (*n* = 128, 0.3%), and not responding to any ACE questions (*n* = 801, 1.2%). For the outcome variable, school absenteeism, only 76 data points (0.12%) were missing. Among all variables included in the analysis, 10% were missing.

Descriptive statistics for demographic variables and ACEs classes are presented in Table 2. More students were in elementary school (39.3%) compared to middle school (32.7%) or high school (28.0%). Chronic absenteeism, missing 15 or more days of school, was noted in 4.1% of the sample. A large percentage of students experienced ACEs. Only 56% had no ACEs, whereas 24% had 1 ACE, 15% had 2 to 3 ACEs, and 6% had 4 or more ACEs. The 5 most common individual ACEs reported were financial hardship (20.2%), parental divorce (19.2%), familial substance use (11.0%), familial mental illness (9.7%), and witnessing or experiencing neighborhood violence (9.0%). Most parents, 87.7%, perceived their child's health as being “excellent/very good” and the majority of children, 75.7%, did not qualify as CSHCN.

INDIVIDUAL ACES AND CHRONIC ABSENTEEISM

When we performed a multivariable logistic regression with the individual ACE questions, we found that only one ACE variable predicted being chronically absent when adjusting for demographic and health indicators of absenteeism (Table 3). This ACE was witnessing or experiencing neighborhood violence (adjusted odds ratio [aOR] 1.55, 95% confidence interval [CI] 1.20–2.01). No other individual ACEs predicted chronic absenteeism.

ASSOCIATIONS BETWEEN ACE SCORE AND CHRONIC ABSENTEEISM

Using a summed ACE score, having 1 or more ACEs was associated with chronic absenteeism compared to children with no ACEs (Table 3). Compared to children with no ACEs, experiencing 1 ACE was associated with chronic absenteeism (aOR 1.35, 95% CI 1.02–1.79), and this association was stronger for children experiencing 2 or more ACEs (2–3 ACEs: aOR 1.81, 95% CI 1.39–2.36; ≥ 4 ACEs: aOR 1.79, 95% CI 1.32–2.43).

LATENT CLASS ANALYSIS FOR ACES

Using latent class analysis, we created a final model of 5 ACE classes based on children's unique exposure to ACEs and the probabilities of endorsing each of these groupings of ACE exposure. The Figure depicts the latent class analysis with the 9 ACE questions on the *x*-axis and the probability of individuals in each class answering “yes” to the specific ACE question on the *y*-axis. The classes are labeled 1 to 5. The percentage of the sample in each class is as follows: class 1 (78.2%), class 2 (8.3%), class 3 (3.5%), class 4 (5.7%), and class 5 (4.3%). The majority of respondents were in class 1, which was characterized by a low probability of endorsing any ACEs. In greatest contrast to class 1 was class 3, where over 50% of the sample endorsed experiencing 7 ACEs: financial hardship, divorce, parental incarceration, domestic violence, neighborhood violence, familial mental illness, and familial substance abuse. In class 2, none of the ACEs was endorsed by more than 50% of the sample, but class 2 differs from class 1 because in class 2 nearly 40% of participants endorsed experiencing financial hardship and

Table 2. Demographic Characteristics of Student Sample by School Attendance Pattern

| Characteristic | All Students, n (%) (n = 58,765) | <15 School Days Missed, n (%) (n = 56,349, 95.9%) | ≥15 School Days Missed, n (%) (n = 2416, 4.1%) |
|---|-------------------------------------|--|---|
| Gender | | | |
| Male | 30,299 (51.6) | 29,096 (51.6) | 1203 (49.8) |
| Female | 28,466 (48.4) | 27,253 (48.4) | 1213 (50.2) |
| School category | | | |
| Elementary school | 23,115 (39.3) | 22,413 (39.8) | 702 (29.1) |
| Middle school | 19,192 (32.7) | 18,413 (32.7) | 779 (32.2) |
| High school | 16,458 (28.0) | 15,523 (27.5) | 935 (38.7) |
| Individual ACEs* | | | |
| Financial hardship | 11,801 (20.2) | 10,851 (19.4) | 950 (39.5) |
| Parental divorce | 11,237 (19.2) | 10,495 (18.7) | 742 (30.8) |
| Death of parent | 1802 (3.1) | 1658 (2.9) | 144 (6.0) |
| Parental incarceration | 3115 (5.3) | 2838 (5.1) | 277 (11.5) |
| Domestic violence | 3643 (6.2) | 3287 (5.9) | 356 (14.8) |
| Neighborhood violence | 5254 (9.0) | 4736 (8.2) | 518 (21.6) |
| Familial mental illness | 5674 (9.7) | 5107 (9.1) | 567 (23.6) |
| Familial substance use | 6441 (11.0) | 5926 (10.6) | 515 (21.4) |
| Racial discrimination | 2763 (4.7) | 2579 (4.6) | 184 (7.7) |
| Race/ethnicity | | | |
| Hispanic | 7305 (12.4) | 7019 (12.5) | 286 (11.8) |
| White, non-Hispanic | 39,927 (67.9) | 38,259 (67.9) | 1668 (69.0) |
| Black, non-Hispanic | 5181 (8.8) | 5031 (8.9) | 150 (6.2) |
| Multiracial/other, non-Hispanic | 6352 (10.8) | 6040 (10.7) | 312 (12.9) |
| Federal poverty level | | | |
| ≤200% | 17,360 (29.5) | 16,230 (28.8) | 1130 (46.8) |
| 201–≤399% | 18,379 (31.3) | 17,685 (31.4) | 694 (28.7) |
| ≥400% | 23,026 (39.2) | 22,434 (39.8) | 592 (24.5) |
| Parent's perception of child's overall health | | | |
| Excellent/very good | 51,513 (87.7) | 50,139 (89.0) | 1374 (56.9) |
| Good | 5745 (9.8) | 5124 (9.1) | 621 (25.7) |
| Fair/poor | 1507 (2.6) | 1086 (1.9) | 421 (17.4) |
| CSHCN | | | |
| Non-CSHCN | 44,481 (75.7) | 43,555 (77.3) | 926 (38.3) |
| CSHCN | 14,284 (24.3) | 12,794 (22.7) | 417 (61.7) |
| Mother's education | | | |
| High school education or less | 4268 (7.3) | 4023 (7.1) | 245 (10.1) |
| High school graduate | 10,846 (18.5) | 10,269 (18.2) | 577 (23.9) |
| More than high school | 43,651 (74.3) | 42,057 (74.6) | 1594 (66.0) |

ACE indicates adverse childhood experience; CSHCN, children with special health care needs.

*Values do not sum to 100% because of missing values.

divorce. Class 4 is distinct in that 50% or more answered yes to only 2 of the ACEs: 54% of the group endorsed parental divorce and 100% of the sample endorsed living with familial substance use. Finally, in class 5, the only ACE to be endorsed by more than 50% of individuals was witnessing or experiencing neighborhood violence. Divorce was commonly reported in classes 2 to 5, and parental death was rarely reported among any of the classes.

ASSOCIATIONS BETWEEN ACE CLASS AND CHRONIC ABSENTEEISM

For the multivariable analysis with the 5 ACEs classes, there was an association between 3 ACEs classes and chronic absenteeism relative to class 1, the class with the fewest ACEs endorsed (Table 3). Class 5 had the greatest association with chronic absenteeism (aOR 2.63, 95% CI 1.87–3.70). Class 5 is characterized by 69% of the sample endorsing neighborhood violence and a less than 50% probability of all other ACEs being reported. In comparison, those in classes 3 and 4 had similar, but slightly lower,

odds of chronic absenteeism (aOR 1.86, 95% CI 1.36–2.55 and aOR 1.80, 95% CI 1.29–2.51, respectively). Class 3 was notable as being the class with the most endorsed ACEs, and class 4 was distinct in that family substance use had the highest probability of being reported.

DISCUSSION

Our nationally representative study of school-age children shows an association between children's ACEs and chronic school absenteeism. While experiencing multiple ACEs does increase the risk of chronic absenteeism, certain ACEs, such as neighborhood violence and family substance use, appear to have a greater effect on the odds of chronic absenteeism. Our findings persisted when controlling for other health factors and social determinants known to cause absenteeism, such as having special health care needs⁸ or living in poverty.³ These findings contribute to the growing literature connecting ACEs to negative childhood developmental and educational outcomes.^{12–14}

Table 3. Logistic Regression of Associations of 3 Separate ACE Analysis Methods and Outcome of Chronic Absenteeism, Missing ≥ 15 Days of School in 1 School Year*

| Characteristic | aOR | 95% CI |
|---------------------------------------|------|-----------|
| Individual ACEs | | |
| Financial hardship | 1.19 | 0.96–1.48 |
| Divorce | 1.04 | 0.82–1.32 |
| Death of parent | 1.21 | 0.84–1.72 |
| Parent incarceration | 0.83 | 0.59–1.16 |
| Domestic violence | 1.04 | 0.76–1.43 |
| Neighborhood violence | 1.55 | 1.20–2.01 |
| Familial mental illness | 1.24 | 0.96–1.62 |
| Familial substance use | 0.97 | 0.76–1.26 |
| Racial discrimination | 1.38 | 0.98–1.95 |
| Summed ACE score | | |
| 0 | 1.00 | Reference |
| 1 | 1.35 | 1.02–1.79 |
| 2–3 | 1.81 | 1.39–2.36 |
| ≥ 4 | 1.79 | 1.32–2.43 |
| ACEs class from latent class analysis | | |
| 1 | 1.00 | Reference |
| 2 | 1.33 | 0.96–1.83 |
| 3 | 1.86 | 1.36–2.55 |
| 4 | 1.80 | 1.29–2.51 |
| 5 | 2.63 | 1.87–3.70 |

ACE indicates adverse childhood experience; aOR, adjusted odds ratio; and CI, confidence interval.

*Adjusted for gender, school category, race/ethnicity, federal poverty level, children with special health care needs, maternal education level, and parental perception of child’s health.

Chronic school absenteeism and ACEs are common experiences shared by many US children. The rate of chronic absenteeism among our entire study sample, 4.1%, is lower than national rates, 14%, as presented by the Department of Education.¹ This can likely be explained by the NSCH data being parent reported and Department of Education data being school reported. Parents are known to underestimate and subsequently underreport children’s absences when

asked to recount their child’s total number of absences during an entire school year.^{28,29} Our ACE findings are similar to published literature on ACEs in childhood. We found that 44% of the sample experienced 1 or more ACEs compared to other studies, where 47%,¹² 55%,¹⁴ and 67%¹³ of children experienced 1 or more ACEs. The variation in children’s total ACEs likely represents different sampling strategies. The NSCH is a nationally representative survey, whereas the latter 2 studies sampled a specifically higher-risk population. Despite this, the most commonly reported ACEs in our study and others are similar: parental divorce, familial substance use, and financial hardship.^{12–14}

In the ACEs literature, there is not yet consensus about the best way to analyze ACEs. Currently there are different approaches for how ACEs are screened^{20–22} and how those ACEs are summed and reported.^{12–14} Therefore, we chose to look for consistent patterns of association between ACEs and chronic absenteeism by examining individual ACEs, summed ACE score, and latent classes of ACEs. Exploring individual ACEs aligns with clinical practice where pediatricians are most experienced asking about individual adversities with known interventions (ie, maternal depression).^{16,22} The total ACE score aligns with current research demonstrating the cumulative effect of multiple ACEs and lower overall health.^{12,30} An emerging literature base uses latent class analysis to examine how multiple ACEs group together.^{31–33} Our latent class analysis provides information about specific combinations of ACEs and their effect on absenteeism but cannot explain the reasons that certain ACEs group together.

While the 3 different analyses had some varying results, we were able to draw some general conclusions considering all 3 analyses together. In general, considering the summed ACE score and latent class analyses, children with 2 or more ACEs had a higher odds of experiencing

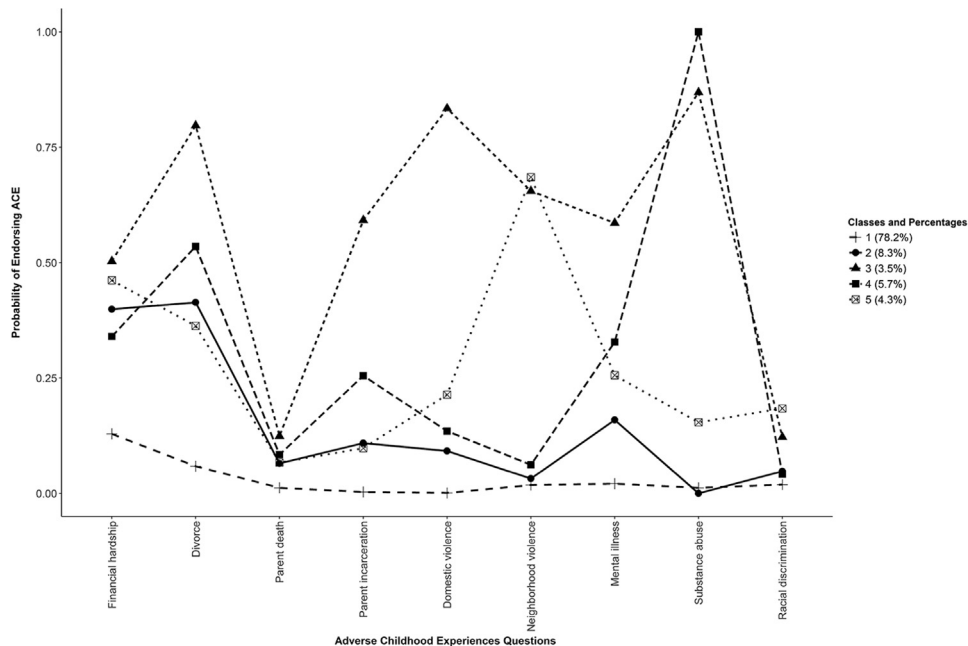


Figure. Plot of 5 latent classes of adverse childhood experiences.

chronic absenteeism. This finding is novel, as prior literature has only found a relationship between higher ACE score and grade repetition or poor school performance.^{12,13} Examining individual ACEs and latent classes indicates that some ACEs are likely to have a greater effect on school attendance than others. Witnessing neighborhood violence had a clear relationship to chronic absenteeism in both analyses, and living with a family member with substance-use issues was related to chronic absenteeism only in the latent class analysis. There is a known relationship between children's exposure to community violence and negative academic outcomes.^{15,34,35} However, the literature on the effect of exposure to community violence and attendance problems has been less clearly defined, likely based on different analytic methods.^{34,35} Similarly, parental mood disorders and substance use have been found to negatively affect children's learning and attendance, but there is a paucity of research examining this related to overall childhood ACEs.^{6,35}

Our findings suggest that pediatricians could consider asking about both ACEs and school attendance when providing care for youth. If they find that children have 2 or more ACEs, this might prompt them to inquire further about school attendance. Conversely, if they find that a child has poor school attendance, they might consider asking about ACEs, and specifically about neighborhood violence or family substance abuse. Asking parents, "How many days in the past month did your child miss school?" identifies children—those who miss more than 4 days a month—at risk for chronic absenteeism. Following an ecological framework, pediatricians can collaborate with families, schools, and community partners to address the child's barriers to school attendance. This may include working within the medical home model to connect caregivers experiencing mental health challenges with appropriate psychosocial supports¹⁰ or partnering with the school to address children's chronic health condition.³

Schools can play a critical role to educate families about the importance of attendance and intervene when attendance difficulties arise.³ This begins with notifying parents of children's school absences in a timely manner and engaging families when the number of absences becomes concerning but not yet chronic. This querying process can identify modifiable reasons for children's absenteeism. The school could then involve school nurses, primary care pediatricians, mental health providers, and social services in a collaborative approach to address these reasons for absenteeism.³ Schools can adopt a trauma-sensitive approach to respond to neighborhood violence or safety concerns. This approach begins with training school personnel and teachers to understand the role of trauma on learning, and it builds on this foundation to create a safe and nurturing environment for student learning.³⁶ Schools can also implement policies that encourage continued school attendance and limit punitive policies that involve the juvenile justice system.^{2,37} Primary care pediatricians who have been asking their patients about attendance and ACEs would be well placed to offer insight and assist schools in ensuring that families are receiving the services they need to support children's

school attendance for ultimately better school performance and long-term health outcomes.

Our study has some limitations. First, the NSCH data are cross sectional, so we are unable to draw conclusions regarding causality. Second, 10% of the data were missing. Yet when we performed the multivariable regression analysis of ACEs using 3 methods, we found general patterns in our results. Third, parents may feel compelled to report socially desirable answers and may report fewer ACEs than their children experience. Further, the ACE questions asked do not address chronicity, timing, or severity of the exposure, all of which may affect children's attendance. Despite these limitations, notable strengths include a large cross-sectional data set, controlling for known factors associated with absenteeism, and using 3 methods to explore the relationship between childhood ACEs and absenteeism.

CONCLUSIONS

Chronic absenteeism is a public health problem that places children at risk for school dropout and negative health outcomes.²⁻⁴ Results from this nationally representative study demonstrate that experiencing multiple childhood ACEs, especially neighborhood violence or family substance abuse, is associated with chronic absenteeism. Pediatricians are well placed to ask about both school attendance and ACEs to then provide tailored anticipatory guidance to limit absenteeism. Addressing chronic absenteeism will require coordinated efforts by pediatric primary care and community partners in schools, mental health, and juvenile justice.

ACKNOWLEDGMENT

Supported in part by National Research Service Award T32 HP10006-19-01.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.acap.2017.09.013>.

REFERENCES

1. US Department of Education. *Chronic absenteeism in the nation's schools: an unprecedented look at a hidden educational crisis. 2013–2014 Civil Rights Data Collection*; 2016. Available at: <https://www2.ed.gov/datastory/chronicabsenteeism.html>. Accessed September 16, 2017.
2. Balfanz R, Byrne V. The Importance of Being in School: A Report on Absenteeism in the Nation's Public Schools. Johns Hopkins University Center for Social Organization of Schools; 2012. Available at: http://www.new.every1graduates.org/wp-content/uploads/2012/05/FINALChronicAbsenteeismReport_May16.pdf. Accessed September 16, 2017.
3. Attendance Works; Healthy Schools Campaign. Mapping the Early Attendance Gap: Charting a Course for School Success; 2015. Available at: <http://www.attendanceworks.org/wordpress/wp-content/uploads/2015/07/Mapping-the-Early-Attendance-Gap-Final-4.pdf>. Accessed September 16, 2017.
4. Ginsburg A, Jordan P, Chang H. Absences Add Up: How School Attendance Influences Student Success; 2014. Available at: http://www.attendanceworks.org/wordpress/wp-content/uploads/2014/09/Absences-Add-Up_090114-1-1.pdf. Accessed September 16, 2017.

5. Olshansky SJ, Antonucci T, Berkman L, et al. Differences in life expectancy due to race and educational differences are widening, and many may not catch up. *Health Aff (Millwood)*. 2012;31:1803–1813.
6. Kearney CA. School absenteeism and school refusal behavior in youth: a contemporary review. *Clin Psychol Rev*. 2008;28:451–471.
7. Glanz K, Rimer BK, Viswanath K. *Health Behavior and Health Education: Theory, Research, and Practice*. New York, NY: Wiley; 2008.
8. Bethell C, Forrest CB, Stumbo S, et al. Factors promoting or potentially impeding school success: disparities and state variations for children with special health care needs. *Matern Child Health J*. 2012;16(suppl 1):S35–S43.
9. Robert Wood Johnson Foundation. The Relationship Between School Attendance and Health; 2016. Available at: <http://www.rwjf.org/en/library/research/2016/09/the-relationship-between-school-attendance-and-health.html>. Accessed August 30, 2017.
10. AAP Council on Community Pediatrics. Poverty and child health in the United States. *Pediatrics*. 2016;137(4).
11. Garner AS, Shonkoff JP. Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health. *Pediatrics*. 2012;129:e224–e231.
12. Bethell CD, Newacheck P, Hawes E, et al. Adverse childhood experiences: assessing the impact on health and school engagement and the mitigating role of resilience. *Health Aff (Millwood)*. 2014;33:2106–2115.
13. Burke NJ, Hellman JL, Scott BG, et al. The impact of adverse childhood experiences on an urban pediatric population. *Child Abuse Negl*. 2011;35:408–413.
14. Jimenez ME, Wade R Jr, Lin Y, et al. Adverse experiences in early childhood and kindergarten outcomes. *Pediatrics*. 2016;137:1–9.
15. Porche MV, Fortuna LR, Lin J, et al. Childhood trauma and psychiatric disorders as correlates of school dropout in a national sample of young adults. *Child Dev*. 2011;82:982–998.
16. Kerker BD, Storfes-Isser A, Szilagyi M, et al. Do pediatricians ask about adverse childhood experiences in pediatric primary care? *Acad Pediatr*. 2016;16:154–160.
17. Maternal and Child Health Bureau; National Center for Health Statistics. 2011/12 National Survey of Children's Health. 2011/12 NSCH SAS indicator data set prepared by the Data Resource Center for Child and Adolescent Health, Child and Adolescent Health Measurement Initiative. Available at: <http://www.childhealthdata.org/>. Accessed August 30, 2017.
18. Blumberg SJ, Foster EB, Frasier AM, et al. Design and operation of the National Survey of Children's Health, 2007. *Vital Health Stat 1*. 2012;55:1–149.
19. Data Resource Center for Child and Adolescent Health. NSCH guide to topics and questions. Available at: http://childhealthdata.org/learn/NSCH/topics_questions. Accessed September 16, 2016.
20. Wade R Jr, Shea JA, Rubin D, et al. Adverse childhood experiences of low-income urban youth. *Pediatrics*. 2014;134:e13–e20.
21. Finkelhor D, Shattuck A, Turner H, et al. A revised inventory of Adverse Childhood Experiences. *Child Abuse Negl*. 2015;48:13–21.
22. Bair-Merritt MH, Zuckerman B. Exploring parents' adversities in pediatric primary care. *JAMA Pediatr*. 2016;170:313–314.
23. Romero M, Young-Sun L. The influence of maternal and family risk on chronic absenteeism in early schooling. National Center for Children in Poverty; 2008. Available at: http://www.nccp.org/publications/pub_792.html. Accessed September 16, 2017.
24. Ready DD. Socioeconomic disadvantage, school attendance, and early cognitive development: the differential effects of school exposure. *Sociol Educ*. 2010;83:271–286.
25. Bethell CD, Blumberg SJ, Stein RE, et al. Taking stock of the CSHCN screener: a review of common questions and current reflections. *Acad Pediatr*. 2015;15:165–176.
26. Carle AC. Fitting multilevel models in complex survey data with design weights: recommendations. *BMC Med Res Methodol*. 2009;9:49.
27. Collins L, Lanza S. *Latent Class and Latent Transition Analysis: With Applications in the Social, Behavioral, and Health Sciences*. New York, NY: Wiley; 2009.
28. Rogers T, Feller A. Intervening through influential third parties: reducing student absences at scale via parents [working paper]. Updated March 9, 2017. Available at: https://scholar.harvard.edu/todd_rogers/publications/reducing-student-absences-scale. Accessed September 7, 2017.
29. California Attendance Parent Survey Results; 2015. Available at: <https://oag.ca.gov/sites/all/files/agweb/pdfs/tr/toolkit/QuantitativeResearchReport.pdf>. Accessed September 7, 2017.
30. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14:245–258.
31. Bjorkenstam E, Burstrom B, Brannstrom L, et al. Cumulative exposure to childhood stressors and subsequent psychological distress. An analysis of US panel data. *Soc Sci Med*. 2015;142:109–117.
32. Ballard ED, Van Eck K, Musci RJ, et al. Latent classes of childhood trauma exposure predict the development of behavioral health outcomes in adolescence and young adulthood. *Psychol Med*. 2015;45:3305–3316.
33. Grasso DJ, Dierkhising CB, Branson CE, et al. Developmental patterns of adverse childhood experiences and current symptoms and impairment in youth referred for trauma-specific services. *J Abnorm Child Psychol*. 2016;44:871–886.
34. Mathews T, Dempsey M, Overstreet S. Effects of exposure to community violence on school functioning: the mediating role of posttraumatic stress symptoms. *Behav Res Ther*. 2009;47:586–591.
35. Cooley-Strickland M, Quille TJ, Griffin RS, et al. Community violence and youth: affect, behavior, substance use, and academics. *Clin Child Fam Psychol Rev*. 2009;12:127–156.
36. National Association of School Psychologists. Trauma-sensitive schools. Brief tips and policy recommendations. Available at: <https://www.nasponline.org/resources-and-publications/resources/mental-health/trauma-sensitive-schools>. Accessed September 26, 2017.
37. Dembo R, Gullede LM. Truancy intervention programs: challenges and innovations to implementation. *Crim Justice Policy Rev*. 2009;20:437–456.