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Overview and Methods for the Youth Risk Behavior Surveillance System — United States, 2023

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Abstract

The Youth Risk Behavior Surveillance System (YRBSS) is a set of surveys that tracks a broad range of behaviors, experiences, and conditions that can lead to poor health among high school students. The system includes a nationally representative Youth Risk Behavior Survey (YRBS) and separate school-based YRBSs conducted by states, tribes, territories, and local school districts. For the 2023 national YRBS, CDC made changes to the sampling method, survey administration mode, and questionnaire. Specifically, the sampling design added an American Indian or Alaska Native (AI/AN) supplemental sample so that separate, precise estimates could be made for AI/AN high school students, in addition to the usual sample designed to provide nationally representative data for the population of students in grades 9–12. To decrease the time needed to collect and process data, CDC changed the survey administration mode from paper-and-pencil scannable booklets to a tablet-based electronic survey. To provide national data on topics of emerging interest, CDC added new questions to the questionnaire. These new questions assessed social media use, experiences of racism at school, adverse childhood experiences, transgender identity, consent for sexual contact, and unfair discipline at school. Public health practitioners and researchers can use YRBSS data to examine the prevalence of youth health behaviors, experiences, and conditions; monitor trends; and guide interventions. This overview report describes 2023 YRBSS survey methodology, including sampling, data collection, data processing, weighting, and data analyses. The 2023 YRBS participation map, survey response rates, and a detailed examination of student demographic characteristics are included in this report. During 2023, in addition to the national YRBS, 68 site-level surveys were administered to high school students in 39 states, three tribal governments, five territories, and 21 local school districts. These site-level surveys use site-specific questionnaires that are similar to the national YRBS questionnaire but are modified to meet sites' needs. This overview and methods report is one of 11 featured in this *MMWR* supplement, which reports results from the 2023 national YRBS but does not include data from the 68 site-level surveys. Each report is based on data collected using methods presented in this overview report. A full description of YRBSS results and downloadable data are available (https://www.cdc.gov/yrbs/index.html).

Introduction

The Youth Risk Behavior Surveillance System (YRBSS) was established in 1991 to monitor priority health-risk behaviors among high school students in the United States. To meet changing needs, YRBSS has evolved to also monitor experiences and conditions affecting the health outcomes of this population. The system includes a national school-based survey administered by CDC and separate school-based surveys administered by states, tribal governments, territories, and local school districts (hereafter site-level or site surveys). These site-level surveys use site-specific questionnaires that allow modifications to the standard Youth Risk Behavior Survey (YRBS) questionnaire to meet state, tribal, territorial, and local needs. The standard YRBS questionnaire included 87 questions and is available at https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2023/2023_YRBS_Standard_HS_Questionnaire.pdf. YRBS coordinators from participating states, tribes, territories, and local school districts voted for or against each proposed change, addition, and deletion. Final content of the standard YRBS questionnaire was decided based on the results of this voting process.

YRBSS offers a unique opportunity to monitor trends in risk behaviors, including some that have been monitored since 1991. As in previous cycles, the 2023 YRBSS measured student demographic characteristics (i.e., sex, sexual identity,

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race and ethnicity, age, and grade) and youth health behaviors, experiences, and conditions including those related to sexual activity, injury and violence, bullying, diet, physical activity, obesity, indicators of mental health, suicide-related behaviors, and substance use (i.e., electronic vapor product and tobacco product use, alcohol use, and other drug use).

For the 2023 YRBS, CDC made changes to the sampling method, survey administration mode, and questionnaire. The sampling design added an American Indian or Alaska Native (AI/AN) supplemental sample that maximized recruitment of AI/AN students. The purpose of this supplemental sample was to allow for separate, precise estimates to be made for AI/AN high school students; this was in addition to the usual sample designed to provide estimates for a nationally representative population of students in grades 9–12. To decrease the time needed to collect and process data, CDC changed the survey administration mode from paper-and-pencil scannable booklets to a tablet-based electronic survey. To provide national data on topics of emerging interest, CDC added new questions to the questionnaire. These new questions assessed social media use, experiences of racism at school, adverse childhood experiences, transgender identity, consent for sexual contact, and unfair discipline at school. Data from these new questions are highlighted in the reports in this *MMWR* supplement.

This report describes the 2023 YRBSS methodology, including sampling, data collection, data processing, weighting, and data analyses. This overview and methods report is one of 11 reports in the *MMWR* supplement featuring 2023 YRBS data. The other 10 reports provide the most recent national data on the following topics: 1) health behaviors and experiences among AI/AN students; 2) social media use; 3) experiences of racism at school; 4) adverse childhood experiences (ACEs); 5) mental health and suicidal thoughts and behaviors; 6) transgender identity; 7) asking for consent, verbally, at last sexual contact; 8) breakfast consumption; 9) physical activity; and 10) report of unfair discipline at school. In total, five individual questions and one set of eight questions (ACEs) were added to the 2023 YRBS questionnaire to examine urgent and emerging student health behaviors and experiences. Along with results from site-level surveys, public health practitioners and researchers can use YRBS data to examine the prevalence of youth health behaviors, experiences, and conditions; monitor trends; and guide interventions. This supplement does not include data from site-level surveys; however, those results can be found in CDC's web-based applications for YRBSS data, including YRBS Explorer (https://yrbs-explorer.services.cdc.gov), Youth Online (https://nccd.cdc.gov/youthonline/App/Default.aspx), and the YRBS Analysis Tool (https://yrbs-analysis.cdc.gov).

National YRBS Methodology

Overview

Historically, YRBS has been administered during the spring of odd-numbered years to students in grades 9–12 enrolled in U.S. public and private schools. Although the previous YRBS was not administered until fall 2021 because of the COVID-19 pandemic, the 2023 survey resumed the typical timing and was conducted during the spring semester (January–June) 2023. Biennial administration of the YRBS allows CDC to assess temporal changes in behaviors among the U.S. high school population. YRBS, conducted among a nationally representative sample of students in grades 9–12 enrolled in U.S. public and private schools, provides comparable data across survey years and allows for comparisons between national and site-level data.

Questionnaire

The YRBS questionnaire uses single-item measures to monitor and describe a wide variety of health behaviors and conditions. In 2023, the questionnaire consisted of 107 questions. Of those, 87 questions were included in the standard questionnaire all sites used as the basis for their site-level questionnaires. Twenty questions were added to the standard questionnaire that reflected areas of particular interest for CDC and other partners. As in all cycles, the previous year's standard questionnaire was revised to allow for the inclusion of questions assessing emerging issues and risk behaviors among high school students. Subject matter experts from CDC, academia, other Federal agencies, and nongovernmental organizations proposed changes, additions, and deletions to the questionnaire. CDC made further refinements to the questionnaire on the basis of feedback from cognitive testing with high school students. The YRBS questionnaire was offered in both English and Spanish.

All questions, except those assessing height, weight, and race, were multiple choice, with a maximum of eight mutually exclusive response options and only one possible answer per question. A recent test-retest study of most of the 2023 survey questions demonstrated substantial reliability among these questions (*1*). The wording of each question, including recall periods, response options, and operational definitions for each variable, are available in the 2023 YRBS questionnaire and data user's guide. (YRBSS data and documentation are available at https://www.cdc.gov/yrbs/data/index.html.)

The shift from paper-and-pencil to electronic survey administration allowed CDC to introduce new questionnaire features. First, for questions related to tobacco products, prescription opioid medicine, and contraceptives, the tablet

displayed images to enhance students' understanding of the question or response options. Second, the questionnaire included skip patterns, meaning that students who responded that they did not engage in a particular behavior (e.g., current cigarette smoking) were not shown subsequent questions regarding that behavior (e.g., number of cigarettes smoked per day). Questions that were skipped appropriately based on responses to a previous question were not coded as missing in the data set, but instead with a response option noting that the student did not engage in the behavior measured in the subsequent question. For example, a student who responded "no" to "Have you ever smoked a cigarette, even one or two puffs?" would not be shown the question, "During the past 30 days, on how many days did you smoke cigarettes?" but their response to that question in the data set would be coded as 0 days. Third, electronic data collection allowed for real-time logic checks, reducing the amount of editing required after data collection (i.e., the questionnaire was programmed so that if students entered an invalid response for items such as height and weight, they were prompted to correct it).

Sampling

The sample for the 2023 YRBS included two components. The main sample was designed to provide nationally representative data. The supplemental sample was designed to be used in combination with the main sample to increase the number of AI/AN participants.

Main Sample

For the main sample, the sampling frame consisted of all regular public schools (including charter schools), parochial schools, and other private schools with students in at least one of grades 9–12 in the 50 U.S. states and the District of Columbia. Alternative schools, special education schools, schools operated by the U.S. Department of Defense or the Bureau of Indian Education, and vocational schools serving students who also attended another school were excluded. Schools with ≤40 students enrolled in grades 9–12 (combined) also were excluded. The sampling frame was constructed from data files obtained from MDR (formerly Market Data Retrieval) and the National Center for Education Statistics (NCES). NCES data sources included the Common Core of Data (https://nces.ed.gov/ccd) for public schools and the Private School Survey (https://nces.ed.gov/surveys/pss) for private schools.

A three-stage cluster sampling design was used to produce a nationally representative sample of students in grades 9–12 who attend public and private schools. The first-stage sampling frame comprised 1,257 primary sampling units (PSUs), which consisted of entire counties, groups of smaller adjacent counties, or parts of larger counties. PSUs were categorized into 16 strata according to their metropolitan statistical area status (i.e., urban or nonurban) and the percentages of Black or African American (Black) and Hispanic or Latino (Hispanic) students in each PSU. Of the 1,257 PSUs, 60 were sampled with probability proportional to overall school enrollment size for that PSU. For the second-stage sampling, secondary sampling units (SSUs) were defined as a physical school with grades 9–12 or a school created by combining nearby schools to provide all four grades. From the 60 PSUs, 180 SSUs were sampled with probability proportional to school enrollment size. To provide adequate coverage of students in small schools, an additional 20 small SSUs were selected from a subsample of 20 of the 60 PSUs. These 200 SSUs corresponded to 204 physical schools. The third stage of sampling comprised random sampling of one or two classrooms in each of grades 9–12 from either a required subject (e.g., English or social studies) or a required period (e.g., homeroom or second period). All students in sampled classes who could independently complete the questionnaire were eligible to participate. Schools, classes, and students that refused to participate were not replaced.

Supplemental Sample

The sampling frame for the AI/AN supplemental sample was constructed using the same data sources and process used for the main sampling frame. As an additional step, the sampling frame was restricted to public schools with an estimated enrollment of ≥28 students in each grade to most efficiently reach AI/AN students. As with the main sample, Bureau of Indian Education schools were not included in the frame because of their unique nature and location on lands that often are tribally controlled (*2*). Although this more restricted frame limited the coverage when using the supplemental sample alone, sample representation of the AI/AN population was expanded when the supplemental sample was combined with the main sample, which represents all schools, including schools with <28 students in each grade as well as nonpublic schools.

As with the main sample, the supplemental sample used a three-stage cluster sampling design. The first-stage sampling frame comprised the same 1,257 PSUs, of which 55 SSUs were sampled with probability proportional to the aggregate AI/AN school enrollment size in grades 9–12. These 55 SSUs corresponded to 114 physical schools. The third stage of sampling followed the same process as for the main sample, except that two classrooms in each grade were selected to participate to maximize the number of AI/AN students.

Data Collection Procedures

Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.* Survey procedures were designed to protect students' privacy by allowing for anonymous participation. Participation was voluntary, and local parental permission procedures were followed before survey administration. During survey administration, students completed the self-administered questionnaire during one class period using tablets that had been programmed with the survey instrument. Trained data collectors visited each school to distribute the tablets to the students and collect them after survey completion. The tablets were not connected to the Internet. Instead, students' data were saved to the tablets, and data collectors synchronized all locally stored data to a central repository at the end of each day.

The shift from paper-and-pencil to electronic questionnaire administration provided several benefits. First, electronic data collection reduced the time needed for students to complete the survey. Whereas the paper-and-pencil version of the survey used in previous cycles took a full 45-minute class period to complete, the tablet version was typically completed in 25 minutes. This decrease is a result of the increased speed of touching a response on a tablet compared with filling a bubble on a scannable booklet using a pencil, as well as the use of skip patterns. Further, students have been found to prefer electronic surveys over paper-and-pencil surveys because of their familiarity with and comfort using electronic devices (*3*). Third, electronic administration eliminated the use of paper. Not only is this a more environmentally friendly approach, but it also increased the speed at which the data could be compiled. Rather than waiting for completed booklets to be shipped and scanned, data were available for processing as soon as the tablets were synchronized. This also allowed CDC to track data collection progress in nearly real-time. Finally, students who were absent on the day of data collection and could not complete the questionnaire on a tablet were able to complete a web-based version of the questionnaire in a setting similar to the tablet administration when they returned to school; 323 surveys were completed using this web-based platform rather than the tablet, which increased overall completion rates by eliminating the need for schools to mail questionnaires back to the survey contractor.

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Response Rates and Data Processing

The main sample and the AI/AN supplemental sample were combined to create a single sample file for the 2023 national survey. At the end of the data collection period, 20,386 questionnaires were completed in 155 schools. The national data set was cleaned and edited for inconsistencies. Missing data were not statistically imputed. A questionnaire failed quality control when <20 responses remained after editing or when it contained the same answer to ≥15 consecutive questions. Among the 20,386 completed questionnaires, 283 failed quality control and were excluded from analysis, resulting in 20,103 usable questionnaires. The school response rate was 49.8%, the student response rate was 71.0%, and the overall response rate (i.e., [student response rate] x [school response rate]) was 35.4%.

Race and ethnicity were ascertained from two questions: 1) "Are you Hispanic or Latino?" (yes or no) and 2) "What is your race?" (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], or White). For the second question, students could select more than one response option. (Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.) Except for the report in this *MMWR* supplement that focused on AI/AN students, students were classified as Hispanic or Latino and are referred to as Hispanic if they answered "yes" to the first question, regardless of how they answered the second question. For example, students who answered "no" to the first question and selected only Black or African American to the second question were classified as Black or African American and are referred to as Black. Likewise, students who answered "no" to the first question and selected only White to the second question were classified and are referred to as White. Race and ethnicity were classified as missing for students who did not answer the first question and for students who answered "no" to the first question and did not answer the second question. Students who selected more than one response option to "What is your race?" were classified as multiracial. This classification of race and ethnicity aligns with the Office of Management and Budget standards in place at the time of the survey (https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf). Although using uniform classifications facilitates trend interpretation and between-group comparisons, preferred terminology classification practices are evolving; the Office of Management and Budget released new standards after the 2023 YRBS cycle was completed (https://www.federalregister.gov/documents/2024/03/29/2024-06469/revisions-to-ombs-statistical-policy-directive-no-15-standards-for-maintaining-collecting-and). In addition, the unilateral classification of

race and ethnicity does not describe the heterogeneity and unique experiences of students within a particular racial or ethnic group (*4*).

To obtain a sufficient sample size for analyses of health behaviors, experiences, and conditions by sexual identity, students were categorized as heterosexual if they chose that response option, and students who responded as gay or lesbian, bisexual, "I describe my sexual identity some other way," or "I am not sure about my sexual identity/questioning" were usually grouped together as LGBQ+ (Table 1). Although this binary categorization often was necessary for statistical analysis, LGBQ+ populations are not a single homogeneous group, and this categorization might result in a loss of understanding the unique experiences of these sexual identity subgroups (*5*). Students also were categorized into those who had no sexual contact, those who had sexual contact with only the opposite sex, or those who had sexual contact with only the same sex or with both sexes on the basis of their responses to the question, "During your life, with whom have you had sexual contact?" Students who had no sexual contact were excluded from analyses related to sexual behaviors. Female students who had sexual contact with only females were excluded from analyses on condom use.

Weighting

Weights were applied to the final sample so that responses were generalizable to the U.S. student population in grades 9–12. For the 2023 YRBS, weights were calculated separately for the main sample and the AI/AN supplemental sample. The calculation of the weights followed the same process for both samples. First, a weight was applied based on student sex, race and ethnicity, and grade to each record to adjust for school and student nonresponse. Next, the two weighted data sets were concatenated and combined weights were calculated as final survey weights. Finally, the overall weights were scaled so that the weighted count of students equaled the total sample size, and the weighted proportions of students in each grade matched the national population proportions. Therefore, in the national data set, weighted estimates are nationally representative of all students in grades 9–12 attending U.S. public and nonpublic schools.

Analytic Methods

Findings presented in this *MMWR* supplement are derived from analytic procedures similar to what is described in this overview report. For more information about the detailed analyses presented in other reports in this supplement (e.g., variables analyzed, custom measures, and data years), see Methods in each individual report.

All statistical analyses used SAS-callable SUDAAN (version 11.0.3 or 11.0.4; RTI International) to account for the complex sampling design and weighting. In all reports, prevalence estimates and CIs were computed for variables used in those reports. Prevalence estimates where the denominator was <30 were considered statistically unreliable and therefore were suppressed. In certain reports, chi-square tests were used to examine associations between health behaviors, experiences, or conditions and demographic characteristics (e.g., sex, race and ethnicity, grade, sexual identity, and sex of sexual contacts). Pairwise differences between groups (e.g., male versus female students) were determined using *t*-tests. All analyses used a domain analysis approach to make certain the accurate calculation of standard errors, CIs, and p values despite missing data in certain variables. Prevalence differences and

TABLE 1. Questions, response options, and analytic coding for sexual identity and sexual contacts — Youth Risk Behavior Survey, United States, 2023

Question	Response option	Analytic coding
Sexual identity		
Which of the following best describes you? 1) Heterosexual (straight), 2) gay or lesbian, 3) bisexual, 4) I describe my sexual identity some other way, 5) I am not sure about my sexual identity/questioning, or 6) I do not know what this question is asking	Heterosexual (straight) (1), gay or lesbian (2) or bisexual (3), describe identity some other way (4), questioning (5), or did not understand (6)	Heterosexual students (1); lesbian, gay, or bisexual students (2 or 3); students who describe identity in some other way (4); questioning students (5); or students missing sexual identity variable (6)
Sex of sexual contacts		
During your life, with whom have you had sexual contact? 1) I have never had sexual contact, 2) females, 3) males, or 4) females and males What is your sex? 1) Female or 2) male	I have never had sexual contact*	Students who had no sexual contact
	Contact: Female, Male — **Student:** Male, Female	Students who had sexual contact with only the opposite sex
	Contact: Male, Females and males, Female, Females and males — **Student:** Male, Male, Female†, Female	Students who had sexual contact with only the same sex or with both sexes

* Excluded from analyses on sexual behaviors.
† Excluded from analyses on condom use.

ratios were calculated using logistic regression with predicted marginals. All prevalence estimates and measures of association used Taylor series linearization. All tests were considered statistically significant at the $p<0.05$ level. Prevalence ratios were considered statistically significant if 95% CIs did not cross the null value of 1.0.

For analyses of temporal trends reported in the YRBSS web applications and the Youth Risk Behavior Survey Data Summary & Trends Report: 2013–2023 (https://www.cdc.gov/yrbs/dstr/index.html), logistic regression analyses were used to examine linear and quadratic changes in estimates, controlling for sex, grade, and racial and ethnic changes over time. A p value of <0.05 associated with a regression coefficient was considered statistically significant. Linear and quadratic time variables were treated as continuous and were coded using orthogonal coefficients calculated with PROC IML in SAS (version 9.4; SAS Institute). A minimum of 3 survey years was required for calculating linear trends, and a minimum of 6 survey years was required to calculate quadratic trends. Separate regression models were used to assess linear and quadratic trends. When a significant quadratic trend was identified, Joinpoint (version 5.02; National Cancer Institute) was used to automate identification of the year when the trend changed. Then, regression models were used to identify linear trends occurring before and after the change in trend. A quadratic trend indicates a statistically significant but nonlinear change in prevalence over time. A long-term temporal change that includes a significant linear and quadratic trend demonstrates nonlinear variation (e.g., leveling off or change in direction) in addition to an overall increase or decrease over time. Cubic and higher-order trends were not assessed.

For analyses of 2-year changes in the YRBSS web applications, prevalence estimates from 2021 and 2023 were compared by using *t*-tests for behaviors, experiences, or conditions assessed with identically worded questions in both survey years. Prevalence estimates were considered statistically different if the *t*-test p value was <0.05.

Data Availability and Dissemination

National and site-level YRBS data (1991–2023) are available in a combined data set from the YRBSS data and documentation website (https://www.cdc.gov/yrbs/data/index.html), as are additional resources, including data documentation and analysis guides. Data are available in both Access and ASCII formats, and SAS and SPSS programs are provided for converting the ASCII data into SAS and SPSS data sets. Variables are standardized to facilitate trend analyses and for combining data. YRBSS data also are available online via three web-based data dissemination tools: Youth Online, YRBS Analysis Tool, and YRBS Explorer. Youth Online allows point-and-click data analysis and creation of customized tables, graphs, maps, and fact sheets (https://nccd.cdc.gov/Youthonline/App/Default.aspx). Youth Online also performs statistical tests by health topic and filters and sorts data by race and ethnicity, sex, grade, and sexual orientation. The YRBS Analysis Tool allows real-time data analysis of YRBS data that generates frequencies, cross-tabulations, and stratified results (https://yrbs-analysis.cdc.gov). YRBS Explorer is an application featuring options to view and compare national, state, and local data via tables and graphs (https://yrbs-explorer.services.cdc.gov).

State, Tribal, Territorial, and Local School District YRBS Methodology

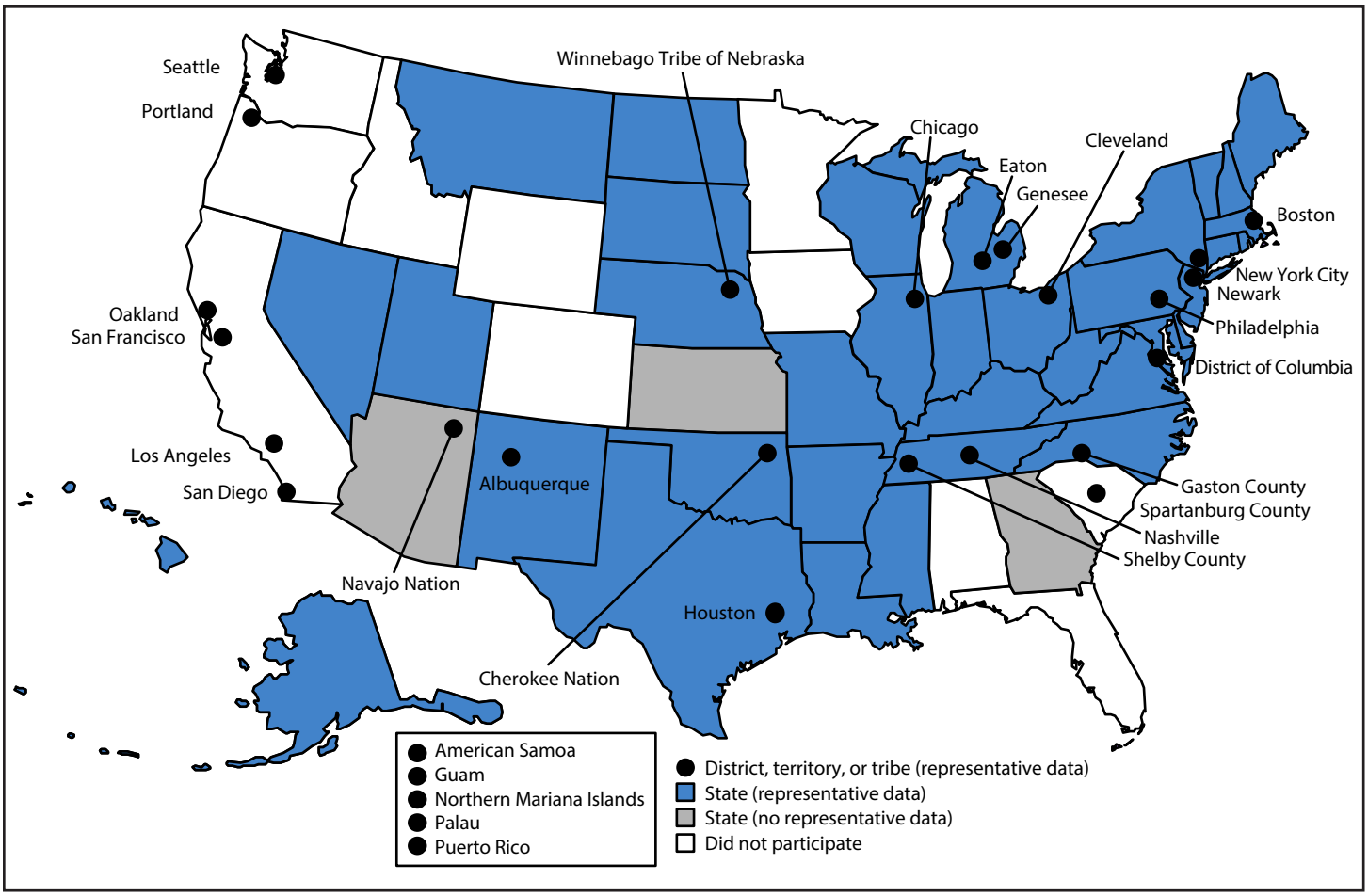
Overview

Biennial administration of site-level YRBSs allows state, tribal, territorial, and local education and health agencies to monitor health behaviors, experiences, and conditions among the high school populations in their respective jurisdictions. Site-level survey data provide comparable data across years within jurisdictions and allow for comparisons of data across jurisdictions (e.g., national to state). Site-level surveys are conducted among students in grades 9–12 attending public schools using samples representative of their jurisdiction. Sixty-eight sites conducted a YRBS in 2023 (39 states, three tribal governments, five territories, and 21 local school districts) (Figures 1 and 2). Four sites administered their surveys during fall 2022, 45 during spring 2023, and 19 during fall 2023. The survey is self-administered anonymously and takes one class period (approximately 45 minutes) or less to complete. Each jurisdiction followed requirements for institutional review board approval of the survey protocols for their respective YRBSs. Survey methodology for data collection, processing, and analytic methods were the same as those described for the national YRBS; however, 32 sites collected data electronically using computers, smartphones, or tablets, and 36 collected data using paper-and-pencil questionnaires and scannable answer sheets.

Questionnaires

The 2023 YRBS standard questionnaire contained 87 questions and was used as the starting point for site-level YRBS questionnaires. Sites could add or delete questions but were required to use at least 58 of the questions on the standard questionnaire, including all demographic questions. This flexibility allowed YRBS coordinators and other state and local partners the opportunity to include topics of interest by customizing their survey.

FIGURE 1. State, tribal government, territorial, and local school district Youth Risk Behavior Surveys — selected U.S. sites, 2023



Sampling

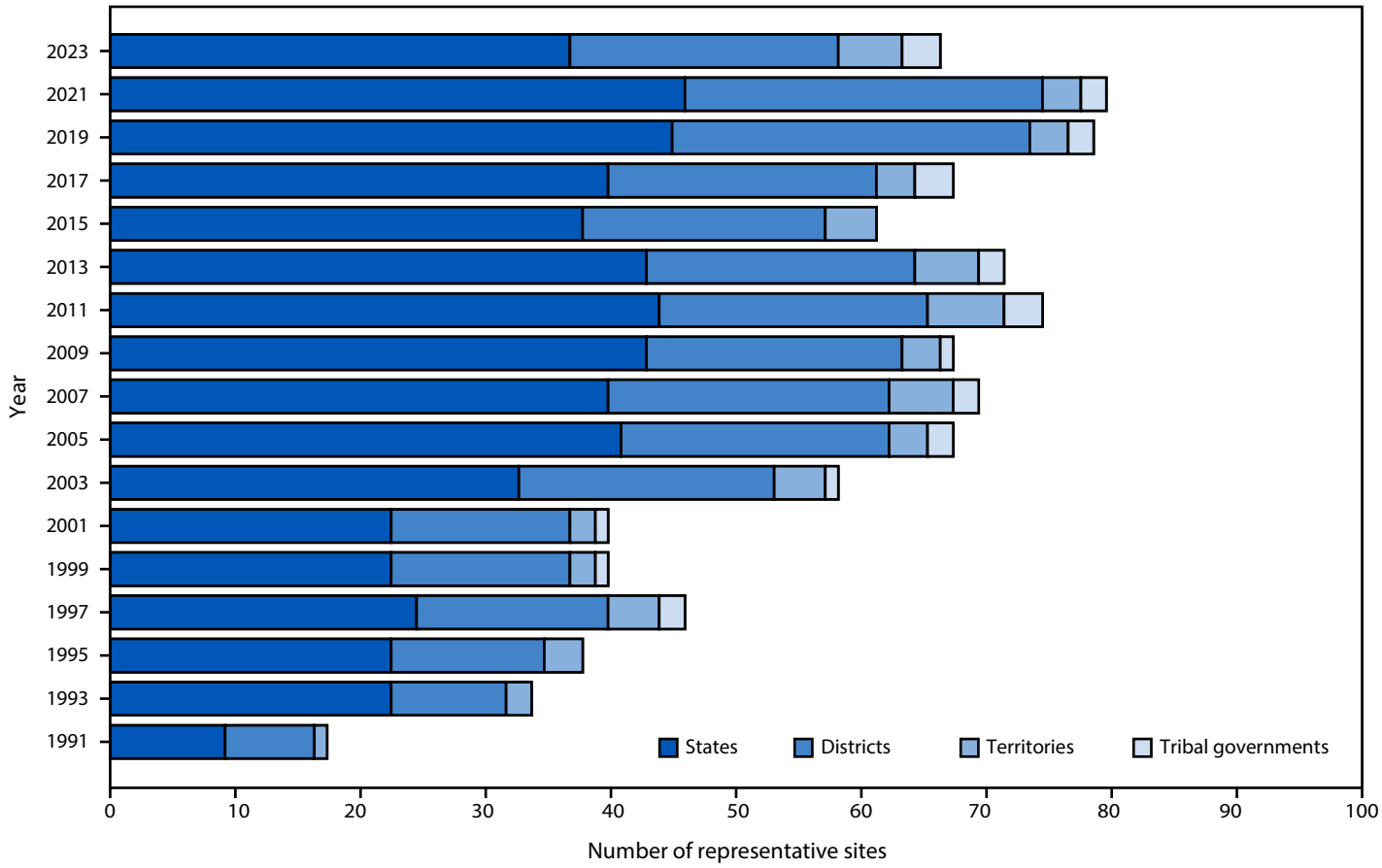
Sites used a two-stage cluster sampling design to produce a representative sample of students in grades 9–12 in their jurisdictions. In 37 states, one tribe, one territory, and four local school districts, in the first sampling stage, public schools with any of grades 9–12 were sampled with probability proportional to school enrollment size. In two states, two tribes, four territories, and 17 local school districts, all schools in the jurisdiction were selected to participate (i.e., a census of schools). In the second sampling stage, classes from either a required subject (e.g., English or social studies) or a required period (e.g., homeroom or second period) were sampled randomly. In seven sites (Vermont, District of Columbia, Navajo Nation, Winnebago Tribe of Nebraska, American Samoa, Northern Mariana Islands, and Palau), a census of students was selected to participate. All students in selected classes who could independently complete the survey were eligible to participate.

Students in schools that were in both the national sample and a site-level sample were asked to participate in only one YRBS. Either the national questionnaire or the site's questionnaire was administered to the students in these schools, and data from questions included on both questionnaires were shared between sites. Because the site questionnaires differ from the national questionnaire, students in these schools were not asked all national YRBS questions. Therefore, for national data, the total number of students answering each question varied.

Response Rates, Nonresponse Bias Analyses, and Weighting

Site-level data sets were cleaned and edited for inconsistencies. Missing data were not statistically imputed. A questionnaire failed quality control when <20 responses remained after editing or when it contained the same answer to ≥15 consecutive questions. CDC conducted nonresponse bias analyses for all sites to determine whether data for each site could be weighted to be representative of its jurisdiction. These analyses compared responding and nonresponding schools on school enrollment size (small, medium, or large), a measure of

FIGURE 2. Number of states, local school districts, territories, and tribal governments with representative Youth Risk Behavior Survey data, by year of survey — selected U.S. sites, Youth Risk Behavior Survey, 1991–2023



the school's poverty level (usually the percentage of students eligible for free or reduced-price lunch), and locale type (city, suburban, town, or rural). Analyses also compared responding and nonresponding students by grade and weighted sample and population percentages by grade, sex, and race and ethnicity. If limited statistically significant differences between comparison groups were found, data were weighted to be representative of their respective populations.

A weight calculated as the product of school base weight, student base weight, school nonresponse adjustment factor, student nonresponse adjustment factor, and poststratification adjustment factor was based on student sex, grade, and race and ethnicity and attached to each record to adjust for school and student nonresponse in each jurisdiction. The weighted count of students equals the student population in each jurisdiction. A total of 36 states, three tribal governments, five territories, and 21 local school districts had representative (weighted) data in 2023 (Figures 1 and 2). In 15 states and 13 local school districts, weighted estimates were representative of all students in grades 9–12 attending regular public schools, and in 21 states and eight local school districts, weighted estimates were representative of regular public-school students plus students in grades 9–12 in other types of public schools (e.g., alternative or vocational schools).

Data Availability and Dissemination

A combined data set including national, state, and local school district YRBS data (1991–2023) is available from the YRBSS data and documentation website (https://www.cdc.gov/yrbs/data/index.html). Availability of site data depends on survey participation, data quality, and data-sharing policies. Information about YRBSS data is available on the participation maps and history website (https://www.cdc.gov/yrbs/data/yrbs-participation.html). Site-level YRBS data collected during 1991–2023 are available through Youth Online (https://nccd.cdc.gov/Youthonline/App/Default.aspx), the YRBS Analysis Tool (https://yrbs-analysis.cdc.gov), and YRBS Explorer (https://yrbs-explorer.services.cdc.gov).

Response Rates and Nonresponse Bias Analyses

The 2023 YRBS overall response rate of 35.4% was the lowest in the history of the survey. Although the student response rate of 71.0% was only slightly lower than in previous cycles (Figure 3), the school response rate of 49.8% was substantially lower. Overall response rates in YRBS have decreased steadily since 2011; these rates have been in the low 60% range since the 2015 cycle and <60% post-COVID in 2021. However, research indicates that a high survey response rate does not necessarily result in an unbiased sample, and that nonresponse bias is not necessarily lower in samples with a higher response rate compared with those with a lower response rate (*6*). For the YRBS, nonresponse bias analyses included bivariate and multivariate analyses of school and student-level characteristics associated with nonresponse. Bivariate analyses revealed significant differences between participating and nonparticipating schools in school type, locale, percentage of Asian students, current per-pupil expenditures, and whether the school offers career and technical education. In a multivariate logistic regression model that included all these variables, only per-pupil expenditure remained a significant predictor of school participation; schools with lower per-pupil expenditure were less likely to participate. Weighting adjustments accounted for nonresponding schools and minimized nonresponse bias (ICF, unpublished data, 2024).

Demographic Characteristics

The 2023 YRBS data were weighted to match national population proportions. After weighting, approximately half of students were male (51.9%), and percentages of students by grade were as follows: grade 9 (26.4%), grade 10 (25.8%), grade 11 (24.2%), and grade 12 (23.3%) (Table 2). In addition, 48.1% of students were White, followed by Hispanic (27.4%), Black (13.3%), multiracial (6.1%), Asian (4.3%), NH/OPI (0.4%), and AI/AN (0.3%).

In 2023, 73.3% of students self-identified as heterosexual, 4.0% as gay or lesbian, 11.4% as bisexual, and 4.4% as questioning; 4.3% responded with "I describe my sexual identity some other way," and 2.5% responded with "I do not know what this question is asking" (Table 2). In 2023, a total of 53.7% of students reported no sexual contact during their lives. An estimated 38.1% of students had sexual contact with the opposite sex only, 5.1% with both sexes, and 3.0% with the same sex only.

Discussion

The 2023 YRBS implemented multiple features that improved the quality and usability of the data. Specifically, the transition from paper-and-pencil to electronic administration helps align YRBS to CDC's Data Modernization Initiative, and decreases the time needed for data collection and processing. Importantly, previous studies demonstrated that electronic administration did not affect prevalence estimates (*7*,*8*). The addition of the AI/AN supplemental sample provides improved

FIGURE 3. Overall, school, and student response rates for the Youth Risk Behavior Survey — United States, 2013–2023

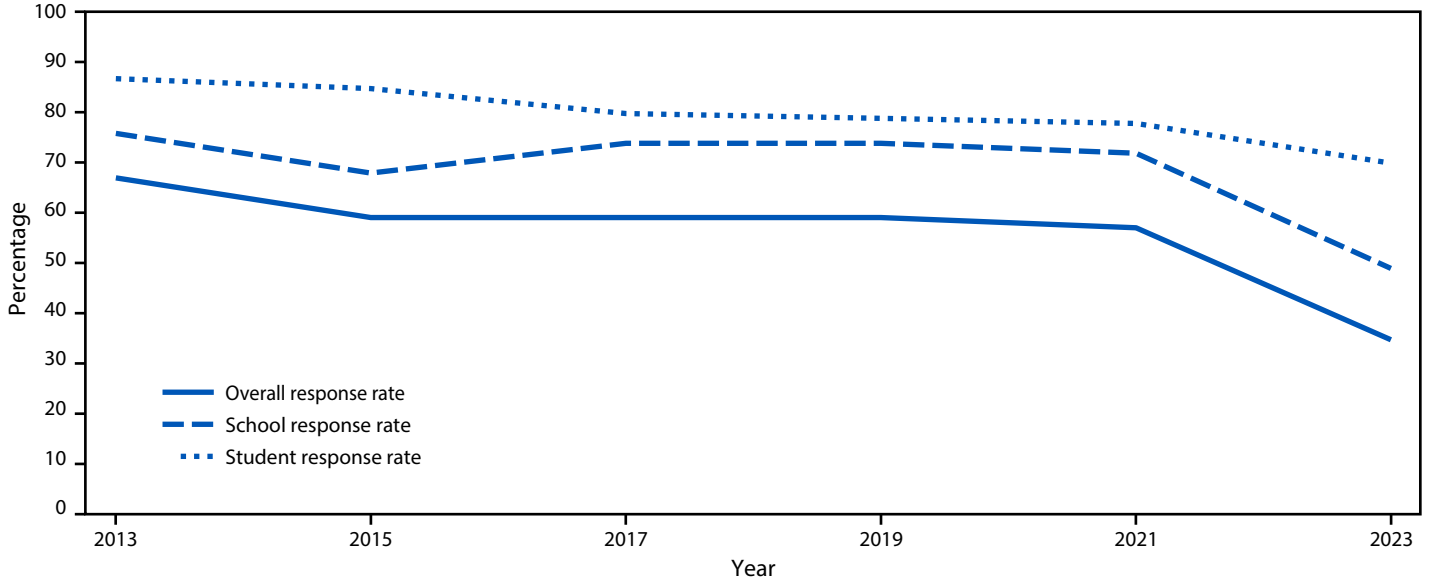


TABLE 2. Student demographic characteristics — Youth Risk Behavior Survey, United States, 2023

Characteristic	No. (%)
Student sample size*	**20,103 (100)**
Sex†	
Female	9,884 (48.1)
Male	10,061 (51.9)
Race and ethnicity§,¶	
American Indian or Alaska Native	1,334 (0.3)
Asian	995 (4.3)
Black or African American	1,791 (13.3)
Native Hawaiian or other Pacific Islander	105 (0.4)
White	9,700 (48.1)
Hispanic or Latino	3,994 (27.4)
Multiracial	1,814 (6.1)
Grade**	
9	5,680 (26.4)
10	5,410 (25.8)
11	4,811 (24.2)
12	3,961 (23.3)
Sexual identity††	
Heterosexual (straight)	13,289 (73.3)
Gay or lesbian	683 (4.0)
Bisexual	2,053 (11.4)
Describe sexual identity in some other way	760 (4.3)
Not sure about sexual identity/questioning	850 (4.4)

* Among the 20,386 completed questionnaires, 283 failed quality control and were excluded from analysis, resulting in 20,103 usable questionnaires.
† Does not include 158 students who did not indicate sex.
§ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all other racial groups are non-Hispanic.
¶ Does not include 370 students who did not indicate race, ethnicity, or both.
** Does not include 48 students who responded, "ungraded or other grade" and 193 students who did not indicate a grade.
†† Does not include 465 students who responded, "I do not know what this question is asking" and 2,003 students with missing data.

precision of nationwide estimates of AI/AN students' health behaviors, experiences, and conditions for the first time in the history of YRBSS. Such data are critical to developing interventions that address the unique needs of AI/AN students. The addition of ACEs questions provides the first nationally representative adolescent data on these experiences, which can also guide interventions developed to prevent and mitigate the effects of ACEs (*9*).

In 2023, overall response rates for the YRBS fell below 40%, continuing a previously reported decline (*10*). These numbers reflect the challenges of obtaining approvals for survey participation at both the school district and school levels. Disinformation campaigns targeting YRBSs across the country also contribute to declining YRBS response rates (*11*). Such campaigns misrepresent survey content, data collection procedures, and data utility. YRBSS continues to collect high quality data via working with state and local partners, using a rigorous complex sample design to ensure that sampled schools are representative of high schools in the United States, oversampling Black and Hispanic students so that estimates derived from their responses are precise, and using weights to adjust for and minimize nonresponse bias and conducting thorough nonresponse bias analyses.

New questions featured in the 2023 YRBS expand on the reach of youth health data and address important issues affecting youths. For example, the report focused on AI/AN students used an inclusive approach to coding race and ethnicity such that all AI/AN students, even those who also identified as another race or as Hispanic, were included as AI/AN. Among AI/AN students, the protective factors of household adult caretaking, parental monitoring, and school connectedness were associated with lower prevalence of substance use, mental health problems and suicide risk, and experiences with violence (*12*). Findings from the report on social media use indicate that approximately three fourths of students reported using social media at least several times a day. This level of social media use was associated with a higher prevalence of bullying victimization at school and electronically, persistent feelings of sadness or hopelessness, seriously considering attempting suicide, and making a suicide plan (*13*). The report about racism found that approximately one in three students had ever experienced racism at school, with higher estimates for Asian, multiracial, and Black students. Students who experienced racism had a higher prevalence of health risk behaviors and experiences. These findings demonstrate that racism is experienced by students within the school setting and continues to disproportionately affect adolescents in racial and ethnic groups that have been marginalized (*14*). The report on ACEs found that ACEs were common, with 76.1% of adolescents reporting ≥1 ACE and 18.5% experiencing ≥4 ACEs. Adolescents who experienced ≥4 ACEs were more likely to identify as female, AI/AN, multiracial, gay or lesbian, bisexual, or to describe their sexual identity in some other way (*9*). The report on transgender identity established that, nationally, 3.3% of adolescents identify as transgender and an additional 2.2% are questioning whether they identify as transgender. Transgender and questioning adolescents have a higher prevalence of experiencing violence, poor mental health, suicidal thoughts and behaviors, and unstable housing and a lower prevalence of school connectedness compared with their cisgender peers (*15*). The report about sexual consent found that 79.8% of high school students asked for consent verbally at last sexual contact. In addition, students who asked for sexual consent verbally were less likely to report first sexual intercourse before age 13 and were more likely to use condoms (*16*). Findings for the report about unfair discipline at school indicated that 19.1% of students reported experiencing unfair discipline during the past year. Black students (23.1%) had

a higher prevalence of reporting unfair discipline compared with White students (18.1%). Furthermore, students who reported receiving unfair discipline were more likely to engage in various health risk behaviors (e.g., skipping school because of feeling unsafe, carrying a weapon on school property, and attempting suicide). These findings highlight the significance of addressing school discipline as a public health issue and intervening on the underlying social drivers of inequity in disciplinary action (*17*). Taken together, these findings from the new questions in the 2023 YRBS document important challenges that adolescents face and, in uncovering these realities, public health practitioners, schools, and families can use these data to take action.

In addition to new questions, prevalences and patterns in health behaviors identified in other reports on longstanding YRBS topics also reinforced the need for specific, tailored public health interventions and resources to improve student health. For example, adolescent mental health and suicide risk remain substantial public health concerns. Identifying protective factors that could foster positive mental health is a critical need. One report found that 39.7% of students experienced persistent sadness and hopelessness, 28.5% experienced poor mental health, 20.4% seriously considered attempting suicide, and 9.5% had attempted suicide. Findings indicate that protective factors (e.g., physical activity, having a household adult that always tried to meet a student's basic needs, and school connectedness) are associated with lower prevalence of poor mental health and suicide risk (*18*). In another area of interest, school administrators are looking to recover learning losses and narrow academic disparities that widened during the COVID-19 pandemic. Students' regular breakfast consumption might help reinforce these efforts. Nationally, 17.9% of students skipped breakfast every day. Skipping breakfast was positively associated with feeling persistently sad or hopeless and negatively associated with school connectedness and getting mostly As and Bs in school (*19*). Findings from the report on physical activity indicated that having a negative safety experience at school often was associated with a higher prevalence of meeting a physical activity guideline. For example, among female students, those who were threatened or injured with a weapon at school were more likely to meet the aerobic guideline of exercising ≥60 minutes/day 7 days a week. Conversely, negative safety experiences at school were associated with a lower prevalence of attending a physical education class. Understanding physical activity behaviors in the context of negative safety experiences is important because only 50% of students meet physical activity guidelines and attend a physical education class on all 5 school days (*20*).

Limitations

Each report in this supplement includes a limitations section pertaining to that specific report. In general, YRBSS findings are subject to at least six limitations. First, YRBSS data apply only to students in grades 9–12 who attend public and private schools in the United States. Homeschooled students are not included nor are persons who do not attend school; therefore, data are not representative of all persons in this age group. In 2022, approximately 5% of youths aged 14–17 years were not enrolled in school (https://nces.ed.gov/programs/digest/d23/tables/dt23_103.20.asp). Second, although the national sample is designed to provide nationally representative estimates, and weighting and nonresponse bias analyses yielded a sample generalizable to U.S. high school students, schools with lower per-pupil expenditure were less likely to participate (ICF, unpublished data, 2024). Third, the extent of underreporting or overreporting of health behaviors, experiences, and conditions cannot be determined, although most questions demonstrate substantial test-retest reliability (*1*). Fourth, students in schools in both the national sample and a site-specific sample were only surveyed once, often using the site-specific questionnaire rather than the national questionnaire. Consequently, not all students in the national sample were asked all questions; therefore, the total number of students answering each question varied. From the data, it is not possible to determine whether a response is missing because the question did not appear in that student's questionnaire, the student did not answer the question, or the response was set to missing because of an out-of-range response or logical inconsistency. Fifth, YRBS data analyses are based on cross-sectional surveys and can only indicate association between variables, not causality. Finally, the survey is descriptive and not designed to explain the reasons behind any observed results.

Conclusion

Despite its limitations, YRBSS remains the best source for quality data at the national, state, tribal, territorial, and local school district levels for monitoring health behaviors, experiences, and conditions that contribute to the leading causes of mortality and morbidity among U.S. high school students and that can lead to health problems as adults. Since its inception in 1991, YRBSS has collected data from approximately 5 million high school students in approximately 2,300 separate surveys. In 2023, in addition to the national data, 36 states, three tribal governments, five territories, and 21 local school districts received data representative of their high school student populations (Figure 1).

This overview report describes YRBSS methods for guiding the analyses presented in this *MMWR* supplement. A full description of 2023 YRBS results and downloadable data from the national and site-specific surveys are available (https://www.cdc.gov/yrbs/index.html).

Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Jonetta Mpofu reported being a board member of the American School Health Association. Lindsay Trujillo reported receiving a grant from Social & Scientific Systems, Inc. No other potential conflicts of interest were disclosed.

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Adult Caretaker Engagement and School Connectedness and Association with Substance Use, Indicators of Emotional Well-Being and Suicide Risk, and Experiences with Violence Among American Indian or Alaska Native High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

The strength of American Indian and Alaska Native (AI/AN) communities comes from generations of Indigenous traditions, language, culture, and knowledge. These strengths have been challenged by a complex set of systemic, structural, and social factors related to historical and intergenerational trauma that affects the health of AI/AN communities. Furthermore, AI/AN population health data often are inaccurate because of analytic coding practices that do not account for multiracial and ethnic AI/AN identification and inadequate because of statistical suppression. The 2023 national Youth Risk Behavior Survey included a supplemental sample of AI/AN high school students. Coding of race and ethnicity was inclusive of all AI/AN students, even if they also identified as another race or as Hispanic or Latino, providing comprehensive data on health behaviors and experiences among AI/AN high school students nationwide. Adult caretaker engagement and school connectedness and their association with 13 health behaviors and experiences were examined, including five types of current substance use, four indicators of emotional well-being and suicide risk, and four types of violence. Pairwise *t*-tests and adjusted prevalence ratios from logistic regression models identified significant associations between exposure and outcome variables. Among AI/AN students, having an adult who always tried to meet their basic needs, high parental monitoring, and high school connectedness were associated with lower prevalence of certain measures of substance use, poor emotional well-being and suicide risk, and violence. Compared with non-AI/AN students, the prevalence of current electronic vapor product use, current marijuana use, attempted suicide, and experience of sexual violence was higher among AI/AN students.

This report presents the most comprehensive, up-to-date data on substance use, indicators of emotional well-being and suicide risk, and experiences with violence among AI/AN high school students nationwide. The findings suggest the importance of engaged household adults and school connectedness in promoting emotional well-being and preventing substance use, suicide-related behavior, and experiences of violence among AI/AN students. Understanding the historical context and incorporating Indigenous knowledge when developing interventions focused on AI/AN youths are critical to ensure such interventions are successful in improving AI/AN health and well-being.

Introduction

The strength of American Indian and Alaska Native (AI/AN) communities comes from generations of Indigenous traditions, language, culture, and knowledge (*1*–*4*). These strengths have, at times, been lost or challenged by a complex set of systemic, structural, and social factors tied to historical and intergenerational trauma (*5*) resulting from the U.S. government's ethnocidal (e.g., Federal assimilation, termination, and relocation) and genocidal policies (e.g., military actions and forced relocation) (*4*). Health disparities that emerge because of these factors are best addressed with interventions that leverage the strengths of AI/AN communities (*1*). Growing up in a safe and stable environment, including one with nurturing relationships with caretakers (i.e., parents,

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other family members, or other adults in the community) who make sure basic needs are met, can reduce or prevent childhood and adolescent risk behaviors and trauma (*6*,*7*). Such nurturing relationships include boundary setting and monitoring children's activities, location, and companions (*8*). Similarly, school connectedness (i.e., students feel close to persons at their school and believe that adults and peers at school care about them, their well-being, and their success) as well as parent or other caretaker engagement have been demonstrated to be particularly protective against behaviors and experiences related to mental health, substance use, sexual activity, and violence among students overall (*8*,*9*). The findings in this report address the need for more research that examines the association between such protective factors and substance use, emotional well-being and suicide risk, and experiences with violence among AI/AN youths.

Data are critical to public health decision-making and priority setting; however, for AI/AN persons, population-based health data are often low quality or inaccurate because of analytic coding practices that do not account for multiracial and ethnic AI/AN identification, lack of inclusion in study samples, and small sample sizes that result in low precision or statistical suppression (*2*,*10*,*11*). For example, one study found that typical analytic strategies used to code race and ethnicity (i.e., counting respondents as AI/AN only if they identified as single race AI/AN) represented only 18% of all AI/AN high school students (*11*). Most (82%) of those who identify as AI/AN also identify as Hispanic or Latino (Hispanic), or as having more than one racial identity (*11*). Using both a supplemental sample of AI/AN students and an inclusive method for coding AI/AN race, this report represents the most comprehensive, up-to-date data on health behaviors and experiences among AI/AN high school students in grades 9–12 nationwide.

The findings provided in this report will be useful for public health and education practitioners working with tribal and urban Indian communities for at least two reasons. First, these data provide the most comprehensive, up-to-date data on substance use, emotional well-being and suicide risk, and experiences with violence among AI/AN high school students nationwide. Second, these data underscore the importance of adult caretaking, parental monitoring, and school connectedness for AI/AN youths' health and well-being. Understanding the historical context and incorporating Indigenous knowledge when developing interventions focused on AI/AN youths are critical to ensure such interventions are successful in improving AI/AN health and well-being.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*12*). The prevalence estimates for adult caretaker engagement and school connectedness for the study population overall and stratified by sex, race and ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

The main exposure variables of interest were household adult caretaking, parental monitoring, and school connectedness (Table 1). One question asked how often during the student's lifetime there had been an adult in the student's household who tried to make sure their basic needs were met. Another asked how often the student's parents or other adults in the family knew where the student was going and with whom they would be (i.e., parental monitoring). The last question asked how close they felt to persons at school (i.e., school connectedness). Thirteen health behaviors and experiences were used as outcome variables, including five types of current substance use, four indicators of emotional well-being and suicide risk, and four types of violence.

Demographic characteristics used in this study included sex (female or male), grade (9, 10, 11, or 12) and race and ethnicity. Students were asked their race and ethnicity using two questions. First, students were asked, "Are you Hispanic or Latino?" (yes or no). Second, students were asked, "What is your race? (Select one or more responses)" (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], or White). Consistent with recommendations for coding race and ethnicity when analyzing surveillance data with a focus on the AI/AN population (*11*), AI/AN race and ethnicity were

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 1. Questions, response options, and analytic coding for adult caretaking, school connectedness, substance use, indicators of emotional well-being and suicide risk, and experiences with violence among American Indian or Alaska Native high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Adult caretaking			
Household adult tried to meet their basic needs	During your life, how often has there been an adult in your household who tried hard to make sure your basic needs were met, such as looking after your safety and making sure you had clean clothes and enough to eat?	Never, rarely, sometimes, most of the time, or always	Always versus not always (never, rarely, sometimes, or most of the time)
Parental monitoring	How often do your parents or other adults in your family know where you are going or with whom you will be?	Never, rarely, sometimes, most of the time, or always	High (most of the time, always) versus low (never, rarely, or sometimes)
School connectedness			
School connectedness	Do you agree or disagree that you feel close to people at your school?	Strongly agree, agree, not sure, disagree, or strongly disagree	High (strongly agree or agree) versus low (not sure, disagree, or strongly disagree)
Substance use			
Current cigarette use	During the past 30 days, on how many days did you smoke cigarettes? [note: the question did not distinguish between commercial and ceremonial use of tobacco]	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes (≥1 day) versus no (0 days)
Current electronic vapor product use	During the past 30 days, on how many days did you use an electronic vapor product? [note: the question did not distinguish between commercial and ceremonial use of tobacco]	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes (≥1 day) versus no (0 days)
Current marijuana use	During the past 30 days, how many times did you use marijuana?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes (≥1 time) versus no (0 times)
Current alcohol use	During the past 30 days, on how many days did you have at least one drink of alcohol?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes (≥1 day) versus no (0 days)
Current prescription opioid misuse	During the past 30 days, how many times did you take prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes (≥1 time) versus no (0 times)
Indicator of emotional well-being and suicide risk			
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Poor mental health	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Never, rarely, sometimes, most of the time, or always	Yes (most of the time or always) versus no (never, rarely, or sometimes)
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes (≥1 time) versus no (0 times)
Experience with violence			
Ever physically forced to have sexual intercourse	Have you ever been physically forced to have sexual intercourse when you did not want to?	Yes or no	Yes versus no
Sexual violence victimization by anyone	During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes (≥1 time) versus no (0 times)
Bullied on school property	During the past 12 months, have you ever been bullied on school property?	Yes or no	Yes versus no
Electronically bullied	During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes or no	Yes versus no

coded to be inclusive of students with any mention of AI/AN (i.e., single race, multiracial, and Hispanic or Latino [Hispanic] AI/AN), with two exceptions. First, students who chose all five race categories were not included in the analytic sample because of concerns of interpretation and data quality, and second, students must have responded to both the race and ethnicity questions. All non-AI/AN students served as the comparison group.

Analysis

For each behavior and experience, weighted prevalence estimates and 95% CIs were calculated overall (i.e., the national sample with all races and ethnicities combined) (N = 20,103) and then among AI/AN (N = 2,770) and non-AI/AN (N = 15,699) students. This study compared differences in

the prevalence of behaviors and experiences between AI/AN and non-AI/AN students using pairwise *t*-tests. All prevalence estimates and measures of association used Taylor series linearization. Tests were considered statistically significant at the $p<0.05$ level. Among AI/AN students, adjusted prevalence ratios were calculated using logistic regression with predicted marginals, which controlled for sex and grade, to examine the association between household adult caretaking, parental monitoring, and school connectedness and the 13 outcome variables. Adjusted prevalence ratios (aPR) were considered statistically significant if the 95% CIs did not include 1.0. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Household Adult Caretaking, Parental Monitoring, and School Connectedness

Overall, 74.7% of students had an adult in the household who always tried to meet their basic needs of safety, clothing, and food; 84.0% of students had a parent or other adult in the family who most of the time or always knew where they were going and with whom they will be (i.e., parental monitoring); and 55.3% felt close to persons at school (i.e., school connectedness) (Table 2). The prevalence of having a household adult who always tried to meet their basic needs was lower among AI/AN students (67.7%) compared with non-AI/AN students (75.3%).

Substance Use

Overall, the prevalence of current cigarette use was 3.5%, current electronic vapor product use was 16.8%, current alcohol use was 22.1%, current marijuana use was 17.0%, and current prescription opioid misuse was 4.4%. The prevalence of current electronic vapor product use and current marijuana use was higher among AI/AN students (22.1% and 23.0%, respectively) compared with non-AI/AN students (17.0% and 17.3%, respectively).

Among AI/AN students, having an adult in the household who always tried to meet their basic needs, compared with not always, was associated with lower prevalence of current electronic vapor product use (16.8% versus 27.8%; aPR = 0.58) (Tables 3 and 4) (Figure). High parental monitoring, compared with low parental monitoring, was associated with lower prevalence of current cigarette use (0.9% versus 11.4%; aPR = 0.07), current electronic vapor product use (15.5% versus 34.8%; aPR = 0.44), and current prescription opioid misuse (3.1% versus 11.6%; aPR = 0.28). High school connectedness, compared with low school connectedness, was associated with lower prevalence of current electronic vapor product use (15.9% versus 27.2%; aPR = 0.53).

Indicators of Emotional Well-Being and Suicide Risk

Overall, 39.7% of students experienced persistent feelings of sadness or hopelessness, 28.5% had poor mental health, 20.4% had seriously considered attempting suicide, and 9.5% had attempted suicide. The prevalence of attempted suicide was higher among AI/AN students (14.4%) compared with non-AI/AN students (9.4%).

Among AI/AN students, having an adult in the household who always tried to meet their basic needs, compared with not always, was associated with lower prevalence of persistent feelings of sadness or hopelessness (40.7% versus 54.2%; aPR = 0.77), having seriously considered attempting suicide (17.0% versus 26.5%; aPR = 0.64), and attempted suicide (7.8% versus 23.9%; aPR = 0.30). High parental monitoring, compared with low parental monitoring, was associated with lower prevalence of attempted suicide (8.4% versus 21.8%; aPR = 0.36). High school connectedness, compared with low school connectedness, was associated with lower prevalence of persistent feelings of sadness or hopelessness (36.0% versus 57.1%; aPR = 0.67), poor mental health (23.0% versus 38.9%; aPR = 0.61), and having seriously considered suicide (12.5% versus 28.6%; aPR = 0.47).

Experiences with Violence

Overall, 8.6% of students had ever been physically forced to have sexual intercourse, 11.4% had experienced sexual violence victimization by anyone, 19.2% had been bullied on school property, and 16.3% had been electronically bullied. Having ever been physically forced to have sexual intercourse was higher among AI/AN students (13.4%) compared with non-AI/AN students (8.6%).

Among AI/AN students, having an adult in the household who always tried to meet their basic needs, compared with not always, was associated with lower prevalence of ever having been physically forced to have sexual intercourse (11.1% versus 18.6%; aPR = 0.54), sexual violence victimization by anyone (9.3% versus 18.9%; aPR = 0.46), and being electronically bullied (13.5% versus 32.3%; aPR = 0.45). High parental monitoring, compared with low parental monitoring, was associated with lower prevalence of sexual violence victimization by anyone (12.5% versus 21.5%; aPR = 0.51). High school connectedness, compared with low school connectedness, was associated with lower prevalence of being electronically bullied (13.0% versus 24.9%; aPR = 0.59).

TABLE 2. Prevalences of adult caretaking, school connectedness, substance use, indicators of emotional well-being and suicide risk, and experiences with violence* among high school students, overall† and by American Indian or Alaska Native identity§ — Youth Risk Behavior Survey, United States, 2023

Variable	Students overall % (95% CI)	AI/AN students % (95% CI)	Non-AI/AN students % (95% CI)
Adult caretaking			
Household adult tried to meet their basic needs (always)	74.7 (72.1–77.1)	67.7 (60.5–74.1)	75.3 (72.8–77.6)¶
Parental monitoring (high)	84.0 (81.2–86.5)	74.7 (61.9–84.4)	84.6 (82.5–86.6)
School connectedness			
School connectedness (high)	55.3 (52.8–57.8)	51.5 (46.4–56.5)	56.1 (53.4–58.9)
Substance use			
Current cigarette use	3.5 (2.9–4.2)	3.9 (2.0–7.4)	3.6 (3.0–4.4)
Current electronic vapor product use	16.8 (15.4–18.2)	22.1 (17.5–27.4)	17.0 (15.6–18.6)¶
Current alcohol use	22.1 (20.5–23.8)	26.1 (20.6–32.5)	22.5 (20.9–24.3)
Current marijuana use	17.0 (15.4–18.7)	23.0 (18.4–28.4)	17.3 (15.7–19.0)¶
Current prescription opioid misuse	4.4 (3.9–5.0)	4.5 (3.0–6.8)	4.3 (3.7–5.0)
Indicator of emotional well-being and suicide risk			
Persistent feelings of sadness or hopelessness	39.7 (37.7–41.7)	45.1 (37.6–52.9)	39.5 (37.4–41.5)
Poor mental health	28.5 (26.7–30.4)	30.4 (23.7–38.1)	29.2 (27.5–31.0)
Seriously considered attempting suicide	20.4 (18.7–22.3)	20.9 (15.6–27.3)	20.8 (19.0–22.7)
Attempted suicide	9.5 (8.4–10.7)	14.4 (9.9–20.6)	9.4 (8.3–10.5)¶
Experience with violence			
Ever physically forced to have sexual intercourse	8.6 (7.7–9.6)	13.4 (9.8–18.0)	8.6 (7.6–9.7)¶
Sexual violence victimization by anyone	11.4 (10.4–12.4)	14.1 (9.8–19.9)	11.4 (10.4–12.6)
Bullied on school property	19.2 (17.3–21.4)	20.3 (14.9–27.0)	19.8 (17.8–21.9)
Electronically bullied	16.3 (14.2–18.5)	19.1 (14.8–24.2)	16.9 (14.8–19.1)

Abbreviation: AI/AN = American Indian or Alaska Native.
* Refer to Table 1 for variable definitions.
† N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.
§ The coding of race and ethnicity was inclusive of all students who identified as AI/AN, even if they also identified as another race or as Hispanic or Latino (Hispanic). AI/AN: N = 2,770 respondents; non-AI/AN: N = 15,699 respondents.
¶ Significantly different from AI/AN based on *t*-test analysis with Taylor series linearization ($p<0.05$).

Discussion

Using a supplemental sample and an inclusive coding strategy to identify AI/AN students, 2023 YRBS data indicated that the prevalence of current electronic vapor product use, current marijuana use, attempted suicide, and ever having been physically forced to have sexual intercourse was higher among AI/AN students compared with non-AI/AN students. Among AI/AN students, the protective factors of household adult caretaking, parental monitoring, and school connectedness were associated with lower prevalence of certain measures of substance use, poor emotional well-being and suicide risk, and violence. The findings in this report are consistent with other findings that family engagement (*7*), parental monitoring (*9*), and school connectedness (*8*) were protective against risk behaviors among high school students.

This report's findings can be used to guide interventions that address the unique needs of AI/AN communities. Traditional Indigenous knowledge has been embraced by the Federal government as a "valid form of evidence for inclusion in Federal policy, research and decision making" (*1*), and any interventions designed for tribal and urban Indian communities must "acknowledge historical context and past injustice" (*1*). Historical instances of systemic physical and intellectual separation of AI/AN populations from land, water, and social systems perpetuated the intentional loss of the AI/AN way of life, resulting in well-documented adverse health outcomes (*1*,*3*,*4*,*13*). However, AI/AN communities have long recognized the importance of Indigenous traditions, language, culture, and knowledge as protective factors that affect health and well-being of Indigenous youths, sometimes referred to as cultural, social, or collective resilience (*13*).

Findings from the 2019 National Indian Education Study (NIES), which considered AI/AN cultures and languages, demonstrated that Native language and culture programs supported student academic achievement, motivation, self-esteem, and pride in grades 4 and 8 (*14*). NIES also found that families involved in volunteer programs or a parent-teacher organization were more likely to have students who were academically high performing (*14*). Such work could be expanded to study the impacts of family engagement, school connectedness, and cultural resilience–focused programs on AI/AN high school students' health behaviors and experiences. Findings from the 2023 YRBS indicated that two in three AI/AN students had a household adult who always tried to

TABLE 3. Prevalence of substance use, indicators of emotional well-being and suicide risk, and experiences with violence among American Indian or Alaska Native high school students,* by household adult tried to meet their basic needs, parental monitoring, and school connectedness†— Youth Risk Behavior Survey, United States, 2023

	Household adult tried to meet their basic needs§		Parental monitoring¶		School connectedness**	
	Always	Not always	High	Low	High	Low
Variable	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Substance use						
Current cigarette use	2.1 (0.8–5.5)	5.1 (3.1–8.3)	0.9 (0.5–1.6)	11.4 (6.3–19.8)	3.4 (1.0–11.3)	3.9 (2.0–7.5)
Current electronic vapor product use	16.8 (12.3–22.6)	27.8 (19.6–37.8)	15.5 (12.0–19.8)	34.8 (23.5–48.0)	15.9 (9.2–26.3)	27.2 (21.7–33.5)
Current alcohol use	22.4 (17.0–28.8)	28.6 (18.7–41.1)	23.1 (17.9–29.4)	34.1 (20.8–50.5)	25.1 (18.1–33.8)	27.1 (18.9–37.3)
Current marijuana use	21.4 (16.1–27.9)	26.2 (17.2–37.6)	21.9 (17.1–27.6)	26.7 (17.3–38.7)	20.9 (15.0–28.3)	27.9 (20.8–36.3)
Current prescription opioid misuse	3.8 (1.9–7.4)	6.2 (3.5–10.9)	3.1 (1.6–5.9)	11.6 (6.1–20.8)	4.2 (1.7–9.9)	5.4 (3.3–8.8)
Indicator of emotional well-being and suicide risk						
Persistent feelings of sadness or hopelessness	40.7 (32.3–49.7)	54.2 (44.0–64.0)	41.7 (33.7–50.1)	52.3 (42.3–62.1)	36.0 (28.2–44.7)	57.1 (45.9–67.6)
Poor mental health	30.9 (24.2–38.4)	36.1 (23.1–51.6)	30.8 (24.0–38.6)	22.2 (11.7–38.0)	23.0 (15.3–33.1)	38.9 (30.3–48.2)
Seriously considered attempting suicide	17.0 (11.0–25.2)	26.5 (17.7–37.7)	17.7 (12.1–25.2)	23.8 (13.9–37.6)	12.5 (8.1–18.8)	28.6 (19.8–39.4)
Attempted suicide	7.8 (4.2–14.0)	23.9 (14.2–37.4)	8.4 (4.6–14.6)	21.8 (15.3–30.2)	10.4 (5.3–19.5)	17.7 (11.9–25.6)
Experience with violence						
Ever physically forced to have sexual intercourse	11.1 (7.0–16.9)	18.6 (11.2–29.2)	13.7 (9.1–20.2)	15.1 (7.7–27.6)	10.8 (6.9–16.7)	18.1 (12.6–25.4)
Sexual violence victimization by anyone	9.3 (6.3–13.5)	18.9 (13.2–26.3)	12.5 (7.9–19.4)	21.5 (14.5–30.6)	10.2 (5.4–18.4)	18.7 (13.0–26.2)
Bullied on school property	18.6 (12.0–27.7)	25.6 (17.4–35.9)	20.1 (12.8–30.0)	19.2 (15.0–24.1)	17.0 (10.6–26.1)	25.1 (18.0–33.9)
Electronically bullied	13.5 (9.2–19.5)	32.3 (21.1–45.9)	15.9 (10.9–22.5)	21.7 (17.2–27.0)	13.0 (8.4–19.7)	24.9 (18.0–33.5)

* N = 2,770. The coding of race and ethnicity was inclusive of all students who identified as American Indian or Alaska Native, even if they also identified as another race or as Hispanic or Latino (Hispanic). The total number of American Indian or Alaska Native students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.
† Refer to Table 1 for variable definitions.
§ Always versus not always (never, rarely, sometimes, or most of the time).
¶ High (most of the time or always) versus low (never, rarely, or sometimes).
** High (strongly agree or agree) versus low (not sure, disagree, or strongly disagree).

meet their basic needs during their lifetime and three in four students reported high parental monitoring, both of which were protective for various behaviors related to substance use, emotional well-being and suicide risk, and violence. Thus, caretaker engagement emerges as a critical component of cultural resilience–focused programs (*6*,*14*) and appears promising in reducing risk behaviors and experiences among AI/AN high school students.

CDC provides various resources for action, including Preventing Adverse Childhood Experiences (https://www.cdc.gov/violenceprevention/pdf/ACEs-Prevention-Resource_508.pdf), Suicide Prevention Resource for Action (https://www.cdc.gov/suicide/resources/prevention.html), and Promoting Mental Health and Well-being in Schools (https://www.cdc.gov/healthyyouth/mental-health-action-guide/index.html?s_cid=hy-2023). These resources offer strategies that are based on the best evidence to support young persons, including those who have experienced trauma. CDC's What Works in Schools program (https://www.cdc.gov/healthyyouth/whatworks/index.htm) focuses on improving school connectedness and has been demonstrated to reduce behavioral risks and improve mental health and well-being. CDC is evaluating additional efforts to design culturally informed strategies that aim to serve the needs of AI/AN students.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*12*). The findings in this report are subject to at least five additional limitations. First, the data in this report are cross-sectional and causality and temporality cannot be inferred despite significant associations. Second, the protective factors examined in this report are all complex constructs that might not be fully captured using one question. For example, parental monitoring involves a combination of factors related to caretaker communication and inquiry as well as child disclosure about where and with whom they will be (*9*). The school connectedness question does not differentiate relationships across peer groups, teachers, and staff (*8*). The question addressing having an adult in the household who tried to meet their basic needs does not fully describe the adult-child relationship (i.e., parent versus another caring adult) or the extent to which that adult was a consistent presence during childhood and into the teenage years. Third, Bureau of Indian Education–funded schools, because of their unique nature and location, often on tribally controlled lands, were not included in the sampling frame. The findings in this report are generalizable to AI/AN students attending public

TABLE 4. Adjusted prevalence ratios* for substance use, indicators of emotional well-being and suicide risk, and experiences with violence among American Indian or Alaska Native high school students,† by household adult tried to meet their basic needs, parental monitoring, and school connectedness§ — Youth Risk Behavior Survey, United States, 2023

	Household adult tried to meet their basic needs¶		Parental monitoring**		School connectedness††	
	Always		High		High	
Variable	aPR (95% CI)	Not always	aPR (95% CI)	Low	aPR (95% CI)	Low
Substance use						
Current cigarette use	0.43 (0.14–1.35)	Ref	0.07 (0.04–0.14)§§	Ref	0.73 (0.20–2.73)	Ref
Current electronic vapor product use	0.58 (0.37–0.92)§§	Ref	0.44 (0.30–0.66)§§	Ref	0.53 (0.29–0.97)§§	Ref
Current alcohol use	0.77 (0.47–1.26)	Ref	0.71 (0.42–1.21)	Ref	0.94 (0.65–1.37)	Ref
Current marijuana use	0.79 (0.52–1.21)	Ref	0.85 (0.56–1.28)	Ref	0.77 (0.51–1.16)	Ref
Current prescription opioid misuse	0.49 (0.19–1.31)	Ref	0.28 (0.10–0.75)§§	Ref	0.56 (0.19–1.68)	Ref
Indicator of emotional well-being and suicide risk						
Persistent feelings of sadness or hopelessness	0.77 (0.61–0.98)§§	Ref	0.78 (0.59–1.03)	Ref	0.67 (0.56–0.80)§§	Ref
Poor mental health	0.86 (0.61–1.21)	Ref	1.40 (0.70–2.80)	Ref	0.61 (0.41–0.91)§§	Ref
Seriously considered attempting suicide	0.64 (0.41–1.00)§§	Ref	0.69 (0.42–1.12)	Ref	0.47 (0.32–0.70)§§	Ref
Attempted suicide	0.30 (0.14–0.61)§§	Ref	0.36 (0.20–0.66)§§	Ref	0.59 (0.33–1.07)	Ref
Experience with violence						
Ever physically forced to have sexual intercourse	0.54 (0.34–0.86)§§	Ref	0.85 (0.46–1.56)	Ref	0.68 (0.38–1.22)	Ref
Sexual violence victimization by anyone	0.46 (0.29–0.73)§§	Ref	0.51 (0.29–0.90)§§	Ref	0.59 (0.31–1.12)	Ref
Bullied on school property	0.79 (0.49–1.25)	Ref	1.02 (0.62–1.68)	Ref	0.71 (0.48–1.05)	Ref
Electronically bullied	0.45 (0.28–0.72)§§	Ref	0.69 (0.43–1.12)	Ref	0.59 (0.39–0.89)§§	Ref

Abbreviations: aPR = adjusted prevalence ratio; Ref = referent group.

* aPRs are based on logistic regression models adjusted for sex and grade.

† N = 2,770. The coding of race and ethnicity was inclusive of all students who identified as American Indian or Alaska Native, even if they also identified as another race or as Hispanic or Latino (Hispanic). The total number of American Indian or Alaska Native students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

§ Refer to Table 1 for variable definitions.

¶ Always versus not always (never, rarely, sometimes, or most of the time).

** High (most of the time or always) versus low (never, rarely, or sometimes).

†† High (strongly agree or agree) versus low (not sure, disagree, or strongly disagree).

§§ aPRs were considered statistically significant; 95% CIs did not include 1.0 ($p<0.05$). Certain statistically significant aPRs have 95% CIs that include 1.0 because of rounding.

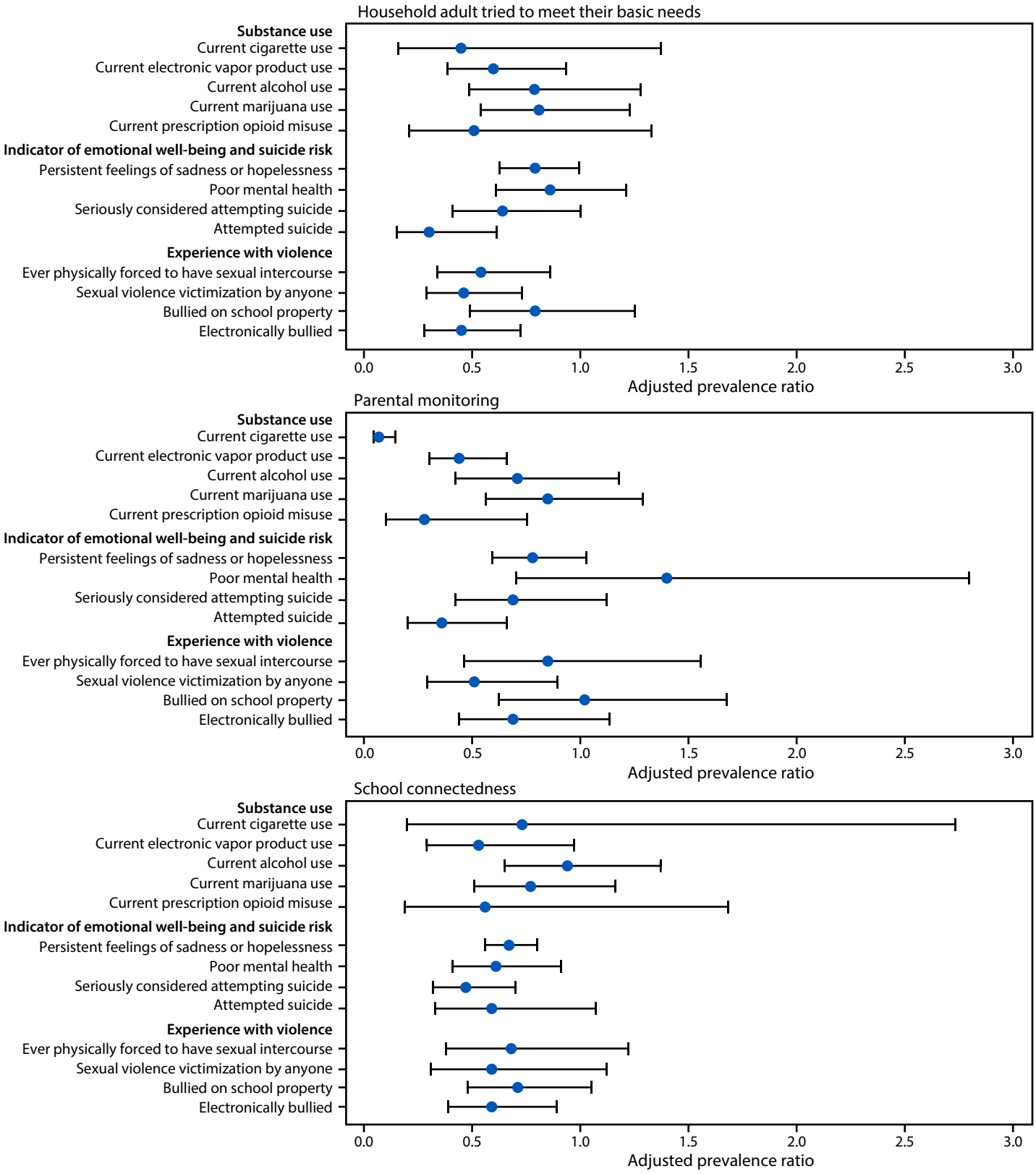
or private schools only. Fourth, YRBS data do not include information about any tribal affiliation, nor whether students lived on or off tribal lands. Residence in tribal lands (e.g., reservations or villages) could have implications for AI/AN youth health behaviors and experiences. Finally, although an advantage of this study is its inclusion of single race, multiracial, and Hispanic AI/AN students in the analysis, the findings should not be compared directly with those of other reports in which non-Hispanic single race AI/AN data are described.

Future Directions

Despite study limitations, the 2023 YRBS contributes important information about AI/AN health behaviors and experiences and points to two future directions for public health data collection with AI/AN youths. First, the 2023 YRBS included a supplemental sample of AI/AN youths, and students were included in the analytic sample if they identified as AI/AN, even if they also identified as another race or as Hispanic. Coding strategies that account for AI/AN youths who are Hispanic and multiracial are critical to appropriately identifying AI/AN youths in public health data systems (*2*,*10*,*11*). Surveillance data that limit AI/AN data to a single race category, especially in many areas in which AI/AN populations are smaller in size relative to other racial or ethnic groups, can lead to misclassification, suppression of data, or loss of important data in a nondescript "other" or multiracial category (*2*,*10*). Quality surveillance data that reflect the multiplicity of AI/AN identity is necessary for future public health policy work.

Second, although national YRBS data are critical to support policy decisions at the national, tribal, state, territorial, or local school district levels, tribal nations also benefit from local and tribally representative data to support tribal policy decisions (*2*,*3*,*10*). Each of the 574 federally recognized tribes has unique cultures, traditions, resources, and needs (*1*,*3*). The Youth Risk Behavior Surveillance System (https://www.cdc.gov/yrbs/index.html) is designed to support tribal nation YRBSs and allows for the collection of YRBS data to support tribal public health and education decision-making while supporting tribal data sovereignty. As with states, school districts, and territories that collect YRBS data representative of their jurisdictions, tribal nations could use such data to describe risk behaviors, experiences, and protective factors; support health-related

FIGURE. Adjusted prevalence ratios* for substance use, indicators of emotional well-being and suicide risk, and experiences with violence among American Indian or Alaska Native high school students, by household adult tried to meet their basic needs, parental monitoring, and school connectedness — Youth Risk Behavior Survey, United States, 2023



* Adjusted prevalence ratios are based on logistic regression models adjusted for sex and grade. Bars indicate 95% CIs.

policies and legislation within the tribe or in local or state governments implementing policies and legislation that affect tribal members; plan and monitor programs; guide professional development; and seek funding (*15*). Meanwhile, outside of tribally coordinated YRBSs, other population studies and analysis of state and school district data could be conducted using the more inclusive race and ethnicity coding strategies used in this report and supported by other research (*10*,*11*). Those data could be used to guide tribally driven public health prevention and wellness programs that address individual and family risk and protective factors associated with the health of AI/AN youths.

Conclusion

For the first time, the 2023 YRBS included a supplemental sample of AI/AN high school students. Furthermore, to best reflect AI/AN youths' own racial identity, race and ethnicity were coded to include single race, multiracial, and Hispanic AI/AN students. Thus, the findings in this report are the most comprehensive, up-to-date data on risk behaviors and experiences among AI/AN high school students nationwide. Among AI/AN youths, lifetime presence of an adult who always tried to meet their basic needs, high parental monitoring, and high school connectedness were associated with lower prevalence of certain measures of substance use, indicators of emotional well-being and suicide risk, and violence. These findings, as with findings from studies examining other racial and ethnic groups (*7*–*9*), suggest the importance of engaged household adults and school connectedness in addressing substance use, suicide-related behavior, and violence among AI/AN students. Understanding the historical context and incorporating Indigenous knowledge (*1*) when developing interventions focused on AI/AN youths are critical to ensure such interventions are successful in improving AI/AN health and well-being.

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Jonetta Mpofu reported being a board member of the American School Health Association. Lindsay Trujillo reported receiving a grant from Social & Scientific Systems, Inc. No other potential conflicts of interest were disclosed.

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Frequent Social Media Use and Experiences with Bullying Victimization, Persistent Feelings of Sadness or Hopelessness, and Suicide Risk Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Social media has become a pervasive presence in everyday life, including among youths. In 2023, for the first time, CDC's nationally representative Youth Risk Behavior Survey included an item assessing U.S. high school students' frequency of social media use. Data from this survey were used to estimate the prevalence of frequent social media use (i.e., used social media at least several times a day) among high school students and associations between frequent social media use and experiences with bullying victimization, persistent feelings of sadness or hopelessness, and suicide risk. All prevalence estimates and measures of association used Taylor series linearization. Prevalence ratios were calculated using logistic regression with predicted marginals. Overall, 77.0% of students reported frequent social media use, with observed differences by sex, sexual identity, and racial and ethnic identity. Frequent social media use was associated with a higher prevalence of bullying victimization at school and electronically, persistent feelings of sadness or hopelessness, and some suicide risk among students (considering attempting suicide and having made a suicide plan), both overall and in stratified models. This analysis characterizes the potential harms of frequent social media use for adolescent health among a nationally representative sample of U.S. high school students. Findings might support multisectoral efforts to create safer digital environments for youths, including decision-making about social media policies, practices, and protections.

Introduction

Social media, defined as "Internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others," has become a pervasive presence in everyday life, including among youths (*1*). Recent data indicate that approximately 95% of high school–aged youths use a social media platform, with approximately one fifth reporting "almost constant" social media use (*2*). Associations between frequent social media use and poor mental health outcomes among adolescents, including depression (*3*) and suicide risk (*4*), are being increasingly documented. Social media use might also increase risk for electronic victimization and perpetration (*5*), which can be antecedents of poor mental health. Evidence suggests that certain youth populations might be more vulnerable than others to potential harms of social media use, such as female and lesbian, gay, bisexual, transgender, and queer or questioning adolescents, who are more likely to experience electronic victimization than male or heterosexual peers (*5*–*7*). However, youths might also benefit from social support and connection found online (*4*,*8*). Understanding potential risks and benefits of social media use is critical for preparing youths to safely engage in an increasingly digitalized world.

This report uses 2023 Youth Risk Behavior Survey (YRBS) data to build on extant literature by examining associations between frequent social media use and U.S. high school students' experiences of bullying victimization, persistent feelings of sadness or hopelessness, and suicide risk. Understanding such patterns and relations might guide public health practitioners' efforts to prevent violence and injury and promote mental health, in line with Healthy People 2030 objectives (https://health.gov/healthypeople). Findings from this report might also support multilevel decision-making about social media use and cross-sectoral initiatives (e.g., education, technology, and policy) to create safer digital environments for youths.

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Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*9*). The prevalence estimates for frequent social media use for the study population overall and stratified by sex, race and ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional reviews boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

The primary exposure, frequency of social media use, was derived from the question, "How often do you use social media?" On the basis of response patterns, responses were dichotomized to reflect whether students used social media at least several times a day (frequent social media use [yes or no]) (Table 1). Six health behaviors or experiences were measured and dichotomized: bullying victimization (bullied at school or electronically bullied; past 12 months [yes or no]), mental health (persistent feelings of sadness or hopelessness; past 12 months [yes or no]), and suicide risk (seriously considered attempting suicide, made a suicide plan, or attempted suicide; past 12 months [yes or no]) (Table 2). The 2023 YRBS questionnaire defined bullying as "when one or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when two students of about the same strength or power argue or fight or tease each other in a friendly way."

Demographic variables included sex (female or male), race and ethnicity, age group (≤14, 15, 16, 17, or ≥18 years), and sexual identity (heterosexual [straight], lesbian or gay, bisexual, questioning [I am not sure about my sexual identity/questioning], or described identity in some other way [I describe my identity some other way]). In the 2023 YRBS, sexual identity and gender identity were measured separately; only sexual identity is included in this analysis.

TABLE 1. Unweighted percentages for social media use item by response options — Youth Risk Behavior Survey, United States, 2023*

Response option	No. (%)
How often do you use social media?	
Less frequent social media use	3,331 (23.0)
1. I do not use social media	1,082 (7.6)
2. A few times a month	406 (2.9)
3. About once a week	231 (1.6)
4. A few times a week	708 (4.8)
5. About once a day	904 (6.1)
Frequent social media use	11,872 (77.0)
6. Several times a day	5,888 (40.1)
7. About once an hour	1,181 (7.4)
8. More than once an hour	4,803 (29.5)
Missing	4,900 (—)

* N = 20,103 respondents.

Race and ethnicity were coded as American Indian or Alaska Native (AI/AN), Asian, Black or African American (Black), Native Hawaiian or other Pacific Islander (NH/OPI), White, Hispanic or Latino (Hispanic), or multiracial (selected more than one racial category). (Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic).

Analysis

Descriptive analyses examined point prevalence estimates and corresponding 95% CIs for frequent social media use in the overall sample and by demographic characteristics. Chi-square tests and pairwise *t*-tests were used to compare demographic group differences. Associations between frequent social media use and health behaviors and experiences (bullying victimization, persistent feelings of sadness or hopelessness, and suicide risk) were assessed in overall and separate logistic regression models stratified by sex or sexual identity, which generated prevalence ratios (PRs) and adjusted PRs (aPRs) for each health behavior and experience. All models were adjusted for demographic variables of race and ethnicity, age, sex, and sexual identity. If a model was stratified by a demographic characteristic, then the model was not adjusted for this characteristic. All prevalence estimates and measures of association used Taylor series linearization. Prevalence ratios were calculated using logistic regression with predicted marginals. Estimates were considered statistically significant if the aPR 95% CIs did not include 1.0 or p value was <0.05. All analyses were conducted in SAS-callable SUDAAN (version 11.0.3; RTI International) using sample weights to account for complex survey design and nonresponse.

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 2. Questions, response options, and analytic coding for frequency of social media use, bullying victimization, persistent feelings of sadness or hopelessness, and suicide risk among high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Frequency of social media use	How often do you use social media*?	I do not use social media, a few times a month, about once a week, about once a day, several times a day, about once an hour, or more than once an hour	≥several times a day (frequent social media use) versus <several times a day (less frequent social media use)
Bullied at school	During the past 12 months, have you ever been bullied on school property?	Yes or no	Yes versus no
Electronically bullied	During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes or no	Yes versus no
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no
Made a suicide plan	During the past 12 months, did you make a plan about how you would attempt suicide?	Yes or no	Yes versus no
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	≥1 time versus 0 times

* The 2023 National Youth Risk Behavior Survey questionnaire describes social media "such as Instagram, TikTok, Snapchat, and Twitter."

Results

Overall, 77.0% of U.S. high school students reported using social media at least several times a day (i.e., frequent social media use) (Table 3). Frequent social media use was more prevalent among female students compared with male students (81.8% versus 72.9%). Heterosexual students reported higher prevalence of frequent social media use than lesbian or gay students (79.2% versus 67.7%). Lesbian or gay students also reported lower prevalence of frequent social media use than students who identified as bisexual (82.2%), questioning (82.6%), or described their sexual identity in some other way (78.8%). AI/AN students had lower prevalence of frequent social media use (53.0%) than Asian, Black, White, Hispanic, or multiracial students.

Students who reported frequent social media use were more likely to be bullied at school and electronically bullied compared with less frequent social media users (Table 4). Frequent social media users also were more likely to report persistent feelings of sadness or hopelessness. Frequent social media use was associated with having seriously considered attempting suicide and having made a suicide plan.

In sex-stratified analysis, female students who reported frequent social media use were more likely to experience bullying victimization at school and electronically compared with less frequent female social media users (Table 5). Female students who reported frequent social media use were also more likely to report persistent feelings of sadness or hopelessness and having seriously considered attempting suicide. Among male students, frequent social media users were more likely to experience bullying victimization electronically. Male students who frequently used social media also were more likely to report persistent feelings of sadness or hopelessness and having seriously considered attempting suicide.

In sexual identity–stratified analyses, students who identified as lesbian or gay, bisexual, questioning, or described their identity in some other way (LGBQ+) and who reported frequent social media use were more likely to experience bullying victimization electronically and persistent feelings of sadness or hopelessness than less frequent LGBQ+ social media users (Table 6). Among heterosexual students, both unadjusted and adjusted analyses found that those who were frequent social media users were more likely than less frequent social media users to experience all observed health behaviors and experiences except for attempted suicide.

Discussion

This report provides the first national prevalence estimate of social media use from a representative sample of U.S. high school students. Findings suggest that most high school students use social media, and that a substantial majority (77.0%) use social media frequently (i.e., at least several times a day) (Table 1). Frequent social media use was largely consistent across demographic characteristics, highlighting the widespread presence of social media during adolescence. Therefore, it remains critical to strengthen collective understanding of potential risks and benefits of social media use for adolescent health and development, and in turn, understand how to create safe digital environments and help youths develop and maintain healthy digital practices that minimize harm (*1*).

TABLE 3. Prevalence of frequent social media use among high school students, overall and by selected demographic characteristics — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Frequent social media use (n = 11,872)† % (95% CI)§	Chi-square test p value¶
Overall	**77.0 (73.5–80.1)**	—
Sex**	—	0.0000
Female	81.8 (77.6–85.3)	—
Male	72.9 (69.8–75.8)	—
Race and ethnicity††	—	0.4503
American Indian or Alaska Native§§	53.0 (33.7–71.5)	—
Asian	75.8 (68.1–82.1)	—
Black or African American	78.7 (75.8–81.2)	—
Native Hawaiian or other Pacific Islander	75.8 (63.1–85.2)	—
White	76.7 (72.9–80.0)	—
Hispanic or Latino	78.0 (71.6–83.2)	—
Multiracial	76.3 (69.3–82.2)	—
Age, yrs	—	0.4937
≤14	74.5 (68.9–79.4)	—
15	76.1 (72.7–79.1)	—
16	77.0 (72.6–80.9)	—
17	79.1 (74.3–83.1)	—
≥18	77.1 (73.2–80.6)	—
Sexual identity	—	0.0587
Heterosexual (straight)¶¶	79.2 (77.2–81.1)	—
Lesbian or gay***	67.7 (57.8–76.3)	—
Bisexual	82.2 (79.3–84.9)	—
Questioning	82.6 (76.2–87.6)	—
Described identity in some other way	78.8 (70.7–85.2)	—

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data. A total of 15,203 students responded to the social media item.

† Unweighted.

§ Weighted.

¶ Chi-square tests were applied to examine the bivariate relations between demographic characteristics and frequency of social media use. Statistical significance is defined as p<0.05 for the chi-square test.

** Female students significantly differed from male students for prevalence of using of social media at least several times a day based on *t*-test with Taylor series linearization (p<0.05).

†† Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

§§ American Indian or Alaska Native students significantly differed from Asian, Black or African American, White, Hispanic or Latino, and multiracial students for prevalence of using social media at least several times a day based on *t*-test with Taylor series linearization (p<0.05).

¶¶ Heterosexual (straight) students significantly differed from lesbian or gay students for prevalence of using social media at least several times a day based on *t*-test with Taylor series linearization (p<0.05).

*** Lesbian or gay students significantly differed from bisexual and questioning students and students who described identity in some other way for prevalence of using social media at least several times a day based on *t*-test with Taylor series linearization (p<0.05).

Certain differences in students' social media use by sex, racial and ethnic identity, and sexual identity were observed. In alignment with previous literature, female students reported higher prevalence of frequent social media use than male students (*6*). AI/AN students reported less frequent social media use compared with those of other racial and ethnic identities, which might reflect differences in broadband Internet access between rural and tribal communities and other communities in the United States (*10*). Lesbian and gay students reported less frequent social media use compared with peers of other sexual identities. This finding contrasts with certain previous literature indicating that lesbian, gay, and bisexual youths might spend more time engaging with identity-affirming communities online, often through social media (*8*). Further research is needed to understand nuances of social media use among youths and the impact of social media on health and well-being for different youth populations.

Consistent with previous research, frequent social media users were more likely to experience bullying victimization (*5*). Previous research has demonstrated evidence of overlap between in-person and electronic bullying contexts, with perpetrators of in-person bullying more likely to perpetrate electronic bullying, and victims of in-person bullying more likely to experience electronic bullying victimization and engage in bullying perpetration (*11*). Such interplay between in-person and electronic bullying environments might explain the finding of higher prevalence of bullying at school among frequent versus less frequent social media users. However, additional research is needed to better understand this phenomenon and the compounding impact of bullying victimization across multiple contexts on adolescents' short- and long-term thriving (*11*).

Associations between frequent social media use and bullying victimization differed by sex and sexual identity. Female students who reported frequent social media use were more susceptible to bullying victimization compared with less frequent female social media users. This might reflect the types of victimization (e.g., relational and psychological) commonly experienced by adolescent girls (*12*), which are suited to digital environments that reduce barriers to conflict (e.g., anonymity and proximity). Among LGBQ+ students, frequent social media users were more likely to experience electronic bullying victimization than less frequent social media users yet demonstrated no significant differences in bullying victimization at school. In contrast, heterosexual students who used social media frequently were more likely to experience both types of bullying victimization compared with heterosexual students who used social media less often. One possible explanation is that LGBQ+ students who use social media frequently have greater exposure to online

TABLE 4. Prevalence estimates, unadjusted, and adjusted prevalence ratios for bullying victimization, mental health, and suicide risk among high school students, stratified by frequency of social media use — Youth Risk Behavior Survey, United States, 2023*

	Frequent social media use			
	Yes	No		
Health behavior and experience (past 12 months)	% (95%CI)	% (95%CI)	PR† (95% CI)	aPR§ (95% CI)
Bullying victimization				
Bullied at school	19.9 (18.3–21.4)	19.0 (12.9–27.1)	1.05 (0.72–1.52)	1.31 (1.12–1.53)¶
Electronically bullied	17.0 (15.7–18.4)	15.9 (8.1–28.7)	1.07 (0.57–2.02)	1.54 (1.26–1.88)¶
Mental health				
Persistent feelings of sadness or hopelessness	42.6 (40.4–44.8)	31.9 (25.3–39.3)	1.33 (1.07–1.65)¶	1.35 (1.23–1.47)¶
Suicide risk				
Seriously considered attempting suicide	20.2 (18.8–21.8)	18.7 (12.8–26.6)	1.08 (0.75–1.55)	1.21 (1.06–1.37)¶
Made a suicide plan	16.6 (15.1–18.2)	17.5 (10.3–27.9)	0.95 (0.58–1.55)	1.16 (1.00–1.35)¶
Attempted suicide	9.5 (8.4–10.8)	9.5 (6.6–13.5)	1.00 (0.70–1.43)	1.11 (0.89–1.39)

Abbreviations: aPR = adjusted prevalence ratio; PR = prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data. A total of 15,203 students responded to the social media item.

† Logistic regression models estimated health behaviors and experiences between those who did and did not use social media at least several times a day.

§ Adjusted for age, race and ethnicity, sex, and sexual identity estimated health behaviors and experiences behaviors between those who did and did not use social media at least several times a day.

¶ Estimates were considered statistically significant if the 95% CIs did not include 1.0. Certain statistically significant aPRs have 95% CIs that include 1.0 because of rounding.

TABLE 5. Prevalence estimates and unadjusted and adjusted prevalence ratios for bullying victimization, mental health, and suicide risk among high school students, by frequency of social media use and sex — Youth Risk Behavior Survey, United States, 2023*

	Frequent social media use							
	Female				Male			
	Yes	No			Yes	No		
Health behavior and experience (past 12 months)	% (95% CI)	% (95% CI)	PR† (95% CI)	aPR§ (95% CI)	% (95% CI)	% (95% CI)	PR¶ (95% CI)	aPR** (95% CI)
Bullying victimization								
Bullied at school	23.0 (21.0–25.2)	19.5 (12.3–29.4)	1.18 (0.76–1.84)	1.54 (1.19–1.98)††	16.6 (14.9–18.4)	18.3 (12.3–26.3)	0.90 (0.61–1.35)	1.17 (0.93–1.47)
Electronically bullied	21.5 (19.7–23.5)	20.0 (10.0–36.1)	1.08 (0.57–2.04)	1.66 (1.31–2.09)††	12.2 (10.7–13.8)	13.0 (6.6–24.0)	0.94 (0.48–1.85)	1.48 (1.09–2.00)††
Mental health								
Persistent feelings of sadness or hopelessness	55.1 (52.3–57.9)	44.4 (37.0–52.1)	1.24 (1.05–1.46)	1.32 (1.20–1.46)¶	29.5 (27.8–31.3)	24.0 (17.8–31.5)	1.23 (0.92–1.64)	1.41 (1.20–1.67)††
Suicide risk								
Seriously considered attempting suicide	26.4 (24.4–28.5)	26.8 (18.4–37.2)	0.98 (0.70–1.39)	1.18 (1.00–1.39)††	13.9 (12.2–15.8)	13.6 (9.10–19.8)	1.02 (0.69–1.52)	1.25 (1.04–1.49)††
Made a suicide plan	21.5 (19.5–23.7)	22.7 (13.4–35.8)	0.95 (0.58–1.54)	1.24 (0.96–1.59)	11.5 (10.3–12.8)	14.1 (8.3–23.0)	0.81 (0.49–1.34)	1.10 (0.90–1.33)
Attempted suicide	12.5 (11.0–14.2)	13.5 (9.0–19.8)	0.92 (0.63–1.36)	1.16 (0.85–1.57)	6.3 (5.1–7.7)	6.6 (4.6–9.2)	0.96 (0.68–1.35)	1.03 (0.77–1.39)

Abbreviations: PR = prevalence ratio; aPR = adjusted prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data. A total of 15,203 students responded to the social media question.

† Logistic regression models estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among female students.

§ Adjusted for age, race and ethnicity, and sexual identity estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among female students.

¶ Logistic regression models estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among male students.

** Adjusted for age, race and ethnicity, and sexual identity estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among male students.

†† Estimates were considered statistically significant if the 95% CIs did not include 1.0. Certain statistically significant aPRs have 95% CIs that include 1.0 because of rounding.

discrimination or stigma-based bullying victimization beyond school networks (*7*,*8*). Therefore, frequent and less frequent social media users could share similar experiences of bullying in at-school networks but different experiences electronically. Further research is needed to understand variations in at-school and electronic networks for youths of different identities and how overlap between at-school and electronic networks might influence bullying victimization.

In alignment with existing research, findings in this report support associations between adolescent social media use and mental health; specifically, frequent social media users were more likely to report persistent feelings of sadness or hopelessness (*3*). Adjusted stratified analyses demonstrated consistent associations across groups, conveying a shared risk for poor mental health among students who are frequent social media users. However, literature also suggests that certain

TABLE 6. Prevalence estimates and unadjusted and adjusted prevalence ratios for bullying victimization, mental health, and suicide risk among high school students, by frequency of social media use and sexual identity — Youth Risk Behavior Survey, United States, 2023*

Health behavior and experience (past 12 months)	Frequent social media use							
	LGBQ+				Heterosexual (straight)			
	Yes	No			Yes	No		
	% (95%CI)	% (95%CI)	PR† (95%CI)	aPR§ (95%CI)	% (95%CI)	% (95%CI)	PR¶ (95%CI)	aPR** (95%CI)
Bullying victimization								
Bullied at school	29.4 (25.5–33.5)	27.2 (21.8–33.5)	1.08 (0.86–1.35)	1.25 (0.96–1.63)	16.8 (15.4–18.4)	12.2 (10.3–14.5)	1.37 (1.15–1.65)††	1.33 (1.12–1.58)††
Electronically bullied	25.5 (21.9–29.4)	18.6 (14.3–23.7)	1.37 (1.03–1.82)††	1.50 (1.14–1.99)††	14.4 (13.2–15.7)	8.6 (6.8–10.8)	1.67 (1.32–2.12)††	1.55 (1.24–1.94)††
Mental health								
Persistent feelings of sadness or hopelessness	68.6 (65.5–71.6)	52.9 (45.5–60.3)	1.30 (1.13–1.49)††	1.23 (1.06–1.44)††	34.4 (32.4–36.4)	22.3 (19.3–25.5)	1.54 (1.36–1.76)††	1.42 (1.27–1.60)††
Suicide risk								
Seriously considered attempting suicide	40.4 (37.3–43.7)	35.3 (30.5–40.4)	1.15 (0.99–1.32)	1.09 (0.93–1.28)	13.9 (12.7–15.1)	10.0 (7.9–12.5)	1.39 (1.12–1.73)††	1.33 (1.08–1.64)††
Made a suicide plan	32.4 (29.3–35.6)	31.1 (25.6–37.2)	1.04 (0.86–1.25)	1.00 (0.81–1.22)	11.7 (10.6–13.0)	8.2 (6.4–10.4)	1.43 (1.12–1.83)††	1.37 (1.07–1.75)††
Attempted suicide	19.4 (16.7–22.4)	18.7 (14.6–23.7)	1.04 (0.77–1.40)	1.00 (0.71–1.41)	6.3 (5.5–7.2)	5.0 (3.2–7.8)	1.25 (0.79–1.96)	1.24 (0.88–1.76)

Abbreviations: aPR = adjusted prevalence ratio LGBQ+ = lesbian or gay, bisexual, questioning, or described identity in some other way; PR = prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data. A total of 15,203 students responded to the social media question.

† Logistic regression models estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among LGBQ+ students.

§ Adjusted for age, race and ethnicity, and sex estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among LGBQ+ students.

¶ Logistic models estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among heterosexual students.

** Adjusted for age, race and ethnicity, and sex estimated health behaviors and experiences between those who did and did not use social media at least several times a day, among heterosexual students.

†† Estimates were considered statistically significant if the 95% CIs did not include 1.0. Certain statistically significant aPRs have 95% CIs that include 1.0 because of rounding.

groups are more vulnerable to the potential negative mental health impacts of social media than others (e.g., adolescent girls) (*6*). In this study, approximately half of female students and one third of LGBQ+ students who frequently used social media reported persistent feelings of sadness or hopelessness, respectively. Findings warrant more rigorous analyses inclusive of multiple mental health indicators to better understand differential impact of frequent social media use by sex, sexual identity, and other key demographic characteristics.

Overall, frequent social media users were more likely to report having seriously considered attempting suicide and having made a suicide plan. No significant differences in reports of attempted suicide by frequency of social media use were observed, perhaps because of the rarity of this behavior in the sample. These findings mirror broader inconsistencies in the literature (*4,13*). Certain researchers posit that the relation between social media use and suicide risk is more complex and indirect than a dose-response phenomenon (*4,13*). For example, differences in how adolescents are exposed to suicide-related content have been demonstrated to influence suicide risk. More interactive and proximate exposures via online discussion forums or suicide clusters might increase risk compared with passive media consumption (*4,14*). In addition, analyses did not describe indirect pathways (e.g., through online victimization or reduced sleep quality) through which frequent social media use might influence mental health and suicide risk, or protective factors (e.g., connectedness to others) that might buffer the negative impacts of frequent social media use on mental health and suicide risk (*4*). Because of persistent concerns about the impact of social media on youth mental health (*1*), additional research is needed to better understand how such pathways might moderate the relation between frequent social media use and suicide risk.

In stratified analyses, associations between frequent social media use and suicide risk diminished, except for heterosexual students. This group might be a factor in the small, significant association between social media use and making a suicide plan observed in the overall sample. Findings suggest that heterosexual students might be more vulnerable to negative impacts of social media on suicide risk. This is surprising because of high prevalence of suicide risk among LGBQ+ students in the sample, but also suggests that social media might not be the most influential factor of suicide risk for LGBQ+ students. Emerging literature has found that social media can be protective for youths who identify as LGBTQ+ by connecting them with affirming communities, support networks, and resources online (*8*) and might even reduce suicide risk for certain youths (*4*). More research is needed to understand potential protective effects of positive connections made through safe and supportive social media environments and their associations with bullying victimization, suicide risk, and mental health.

Limitations

General limitations of the YRBS are available in the overview report of this supplement (*9*). Findings in this report are subject to at least six additional limitations. First, YRBS data are cross-sectional; causality and directionality of associations between frequent social media use and health behaviors and experiences cannot be established. Second, YRBS examples of social media were not exhaustive; students might engage in other online platforms that were not considered in responses to the social media item. Third, differences between social media nonusers and infrequent users might be masked. Responses to the social media item were dichotomized to ensure sufficient statistical power, and respondents who selected "I do not use social media" were grouped with less frequent social media users (Table 1). Fourth, to maintain consistency in recall period across health behaviors and experiences, analyses only included one mental health indicator; students reporting on other indicators of poor mental health might have been missed. Fifth, sexual identities were dichotomized into two broad categories in stratified analysis because of sample size limitations. Because of significantly lower prevalence of frequent social media use among lesbian and gay students, combining them with students of other sexual identities might have hidden possible stronger effects or differences for other identities. Finally, with the availability of social media, bullying victimization at school can occur in person or electronically; similarly, electronic bullying can happen at school or elsewhere. Therefore, the two bullying victimization measures (i.e., at school and electronically) might not be mutually exclusive because these two pathways of bullying might overlap.

Future Directions

Findings from this study highlight key areas for future research and practice regarding youth social media use and related health behaviors and experiences. This study identified important differences in frequent social media use and its impact on bullying victimization, persistent feelings of sadness and hopelessness, and suicide risk by sex and sexual identity; however, consensus is lacking about how best to measure social media use (*3*,*4*). Future research that identifies how different social media measures (e.g., frequency of use, passive versus active use, and addiction to use) might differentially describe social media and related health outcomes is important to further understanding of potential risks and benefits of youth social media use. In addition, these findings warrant additional exploration of the differential association of social media use with bullying, mental health, and suicide risk by racial and ethnic identity of youths along with more detailed analyses of differences by sexual identity and gender identity. Investigating such associations among frequent social media users might increase understanding about which students are more vulnerable to the negative impacts of frequent social media use. Future research exploring the pathways through which social media use might lead to poor mental health and suicide risk, including through cyberbullying and victimization, also is needed.

Improved understanding of youths' social media use and related health outcomes can strengthen cross-sectoral endeavors to create safer digital environments, such as consumer safety policies, media literacy education and standards, and platform-based protections for youths online (*1*). This understanding might also help empower youths and families to make informed decisions about social media use and online behaviors that reduce risk for negative health outcomes, including bullying victimization, poor mental health, and suicide (*1*). School-based interventions that address bullying and suicide prevention have been proven to be effective (*15*,*16*). Strengthening youths' health-enhancing skills, creating protective environments, and promoting connections to positive adults and peers through programs such as What Works in Schools (https://www.cdc.gov/healthyyouth/whatworks/index.htm) can help reduce risk for multiple forms of violence and suicide (*17*). CDC's Community Violence Prevention Resource for Action (https://www.cdc.gov/violence-prevention/media/pdf/resources-for-action/CV-Prevention-Resource-for-Action_508.pdf) and Suicide Prevention Resource for Action (https://www.cdc.gov/suicide/resources/prevention.html) contain strategies based on the best available evidence to reduce community violence, including youth violence and bullying, and suicide. StopBullying.gov (https://www.stopbullying.gov/prevention/how-to-prevent-bullying) provides steps that schools, youths, and their families can take to prevent bullying, including setting clear behavioral expectations and promoting empathy, self-awareness, and self-regulation skills. The U.S. Surgeon General's Advisory on Social Media and Youth Mental Health (https://www.hhs.gov/surgeongeneral/priorities/youth-mental-health/social-media/index.html#action) and American Academy of Pediatrics' Center of Excellence on Social Media and Youth Mental Health (https://www.aap.org/en/patient-care/media-and-children/center-of-excellence-on-social-media-and-youth-mental-health) provide recommendations on ways youths and families can reduce risk for harm from social media use (e.g., developing family media plans to promote healthy social media use). More research is needed to rigorously test and evaluate interventions that incorporate evidence-based prevention strategies among youths who use social media, particularly those at increased risk for harms associated with frequent social media use.

Conclusion

Overall, approximately three fourths of U.S. high school students reported using social media at least several times a day. Frequent social media use among students was associated with higher prevalence of bullying victimization at school and electronically, persistent feelings of sadness and hopelessness, having seriously considered attempting suicide, and having made a suicide plan. Associations between frequent social media use and these health behaviors and experiences differed by sex and sexual identity. Although additional research is needed to understand precisely how social media use differentially affects adolescent risk for bullying victimization, poor mental health, and suicide, existing evidence-based prevention strategies can be used by families, schools, and communities to promote adolescent mental health and prevent injury and violence.

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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Experiences of Racism in School and Associations with Mental Health, Suicide Risk, and Substance Use Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Racism is a fundamental determinant of health inequities among racial and ethnic groups and is understudied among adolescents. In 2023, the national Youth Risk Behavior Survey questionnaire included an item assessing experiences of racism in the school setting among students in grades 9–12 in the United States. This report estimates the prevalence of students who reported ever having experienced racism in school and compares prevalence by racial and ethnic groups. For each racial and ethnic group, prevalence differences and prevalence ratios were estimated comparing the prevalence of indicators of poor mental health, suicide risk, and substance use among students who reported that they have ever versus never experienced racism in school. In 2023, approximately one in three high school students (31.5%) said that they had ever experienced racism in school. Reported experiences of racism were most prevalent among Asian (56.9%), multiracial (48.8%), and Black or African American (Black) (45.9%) students and least prevalent among White students (17.3%). Black and Hispanic or Latino (Hispanic) students who reported experiencing racism had a higher prevalence of all health risk behaviors and experiences investigated, including indicators of poor mental health, suicide risk, and substance use compared with students of their racial and ethnic group who reported never experiencing racism. Many of these associations were also found among multiracial and White students. Student reports of racism were associated with indicators of mental health and suicide risk among American Indian or Alaska Native (AI/AN) and Asian students. Among students of color, including AI/AN, Asian, Black, Hispanic, and multiracial students, the prevalence of seriously considering and attempting suicide was more than two times higher among students who ever compared with never experienced racism. These findings demonstrate that racism in the school setting is experienced by high school students attending public and private schools and continues to disproportionately affect students of color. Students who reported experiencing racism had a higher prevalence of indicators of poor mental health, suicide risk, and substance use. Schools can incorporate policies and practices to prevent unfair treatment on the basis of race and ethnicity and offer resources to help students cope with these experiences.

Introduction

Racism, defined as "a system consisting of structures, policies, practices, and norms that assigns value and determines opportunity based on the way people look or the color of their skin," persists within U.S. society and "is the root cause of many health disparities" (*1*) (https://www.cdc.gov/minorityhealth/racism-disparities/index.html). Associations between self-reported experiences of racism and the social, emotional, mental, and physical health of racial and ethnic communities that have been marginalized are well-documented (*2*). Because experiences of racism can have cumulative effects on health throughout the life course, experiences of racism early in childhood and adolescence can be particularly detrimental (*3*). In 2021, the Adolescent Behaviors and Experiences Survey (ABES) demonstrated that up to one third of all high school students nationwide and more than 50% of Asian, Black or African American (Black), and multiracial high school students in the United States reported that they had ever experienced racism in school (*4*). Typically, high school students spend up to 6 hours per day and 180 days per year in school (*5*), making the school environment an important social structure for adolescents (*6*) where positive or negative experiences with administrators, teachers, and other students can have an impact on their health and well-being. Therefore, continuing to monitor, understand, and address experiences of racism

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among adolescents in schools and intervening to prevent these experiences and their acute and lasting effects on health is important.

In 2023, for the first time, the national Youth Risk Behavior Survey (YRBS) included a question assessing experiences of racism in school. This is the first report using YRBS data to examine experiences of racism in school and its association with health. The objectives of this report were to describe the prevalence of experiencing racism in school, overall and stratified by race and ethnicity, and to describe associations between experiencing racism in school and mental health, suicide risk, and substance use by racial and ethnic group. Findings from this report can assist public health practitioners, school leaders, teachers, parents, students, and policymakers in understanding the prevalence of racism experienced by students in schools and associations with health risk behaviors. Increased understanding of students' experience of racism in school and associated health outcomes can provide evidence and guidance for strategies that promote health and well-being for all students.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*7*). The prevalence estimates for experiences of racism in school for the study population overall and stratified by sex, race and ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional reviews boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

Experience of racism in school was measured by the question, "During your life, how often have you felt that you were treated badly or unfairly in school because of your race or ethnicity?" (never, rarely, sometimes, most of the time, or always). This measure, adapted from the Perceptions of Racism in Children and Youth (PRaCY) scale, has demonstrated validity and reliability among children and youths aged 8–18 years from diverse racial and ethnic backgrounds (*8*). This measure was dichotomized to ever (rarely, sometimes, most of the time, or always) versus never (never) in all analyses. A definition of racism was not given to students when responding to this question.

Health risk behaviors and experiences were investigated in association with experiences of racism (Table 1). Demographic measures included sex, race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], or multiracial [selected >1 racial category]) (persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic), grade (9, 10, 11, and 12), and sexual identity (heterosexual [straight]; lesbian, gay, bisexual, or questioning [I am not sure about my sexual identity/questioning]; or describe identity in some other way [I describe my identity some other way] [LGBQ+]).

Analysis

Prevalence of ever experiencing racism in school was estimated for all students and stratified by race and ethnicity. Within racial and ethnic groups, prevalence was further stratified by sex, grade, and sexual identity. Prevalence ratios (PRs) were estimated comparing the prevalence of experiencing racism by racial and ethnic groups and within them (by sex, grade, and sexual identity), with White students, male students, heterosexual students, and students in grade 9 as the referent group when applicable. Referent groups were those with the lowest prevalence of experiences of racism in school based on 2021 ABES data (White students and male students) (*4*) or referent groups based on common practice with survey data (heterosexual students and students in grade 9). The prevalence of health risk behaviors and experiences for students who reported having ever and never experienced racism in school was calculated for the overall sample and stratified by race and ethnicity. For the overall sample, *t*-tests compared the prevalence of health risk behaviors and experiences among students who ever versus never experienced racism in school. However, within each racial and ethnic group, prevalence differences (PDs) and PRs were estimated comparing the prevalence of health risk behaviors and experiences among students who ever versus never experienced racism in school. All prevalence estimates and measures of association used Taylor series linearization. PDs and PRs were calculated using logistic regression with predicted marginals. Differences detected by *t*-test analyses were considered statistically significant at the

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 1. Questions, response options, and analytic coding for experiences of racism in school, mental health, suicide risk, and substance use among high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Experiences of racism in school			
Experienced racism in school	During your life, how often have you felt that you were treated badly or unfairly in school because of your race or ethnicity?	Never, rarely, sometimes, most of the time, or always	Ever: Rarely, sometimes, most of the time, or always Never: Never
Mental health			
Current poor mental health	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Never, rarely, sometimes, most of the time, or always	Yes: Most of the time or always No: Never, rarely, or sometimes
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes: Yes No: No
Suicide risk			
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes: Yes No: No
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes: 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times No: 0 times
Substance use			
Current use of any tobacco product	During the past 30 days, on how many days did you A) smoke cigarettes? B) smoke cigars, cigarillos, or little cigars, such as Swisher Sweets, Middleton's (including Black and Mild), or Backwoods? C) use chewing tobacco, snuff, dip, snus, or dissolvable tobacco products, such as Copenhagen, Grizzly, Skoal, Camel Snus, or Velo Nicotine Lozenges? D) use an electronic vapor product	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days,3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days for any included substances No: 0 days for all included substances
Current alcohol use	During the past 30 days, on how many days did you have at least one drink of alcohol?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Current marijuana use	During the past 30 days, how many times did you use marijuana?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Current prescription opioid misuse	During the past 30 days, how many times did you take prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times

p<0.05 level. PRs were considered statistically significant if the 95% CIs did not include 1.0, and p values for PDs were considered statistically significant at the p<0.05 level. Prevalence estimates with denominators <30 were considered statistically unreliable and therefore were suppressed (*7*); thus, associations between racism and health risk behaviors and experiences could not be assessed among NH/OPI students. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Overall, 31.5% of high school students reported having ever experienced racism in school (Table 2). The prevalence of experiencing racism was 56.9% among Asian students, 48.8% among multiracial students, 45.9% among Black students, 39.4% among Hispanic students, 38.0% among AI/AN students, 37.6% among NH/OPI students, and 17.3% among White students. Reports of ever experiencing racism in school were two to three times higher among non-White compared with White students. Among Asian, Black, Hispanic, and multiracial students, the prevalence of ever experiencing racism in school was approximately 1.2 times higher among female students compared with male students (Supplementary Table, https://stacks.cdc.gov/view/cdc/160512). Among Black, Hispanic, and multiracial students, the prevalence of ever experiencing racism in school was approximately 1.2–1.5 times higher among LGBQ+ students compared with heterosexual students.

Among students overall, poor mental health, suicide risk, and substance use were consistently higher among students who reported having ever experienced racism in school compared with students who reported having never experienced racism (Table 3). In analyses stratified by racial and ethnic

TABLE 2. Prevalence of ever experiencing racism in school among high school students, overall and by race and ethnicity — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Ever experienced racism† %§ (95% CI)	PR¶ (95% CI)
Race and ethnicity**		
American Indian or Alaska Native	38.0 (27.2–50.1)	2.20†† (1.58–3.07)
Asian	56.9 (45.0–68.0)	3.30†† (2.57–4.22)
Black or African American	45.9 (37.6–54.4)	2.66†† (2.13–3.31)
Native Hawaiian or other Pacific Islander	37.6 (19.6–59.8)	2.18†† (1.21–3.94)
White	17.3 (15.1–19.7)	Ref
Hispanic or Latino	39.4 (35.8–43.1)	2.28†† (1.95–2.68)
Multiracial	48.8 (42.4–55.3)	2.83†† (2.34–3.42)
Total	**31.5 (29.0–34.2)**	—

Abbreviations: PR =prevalence ratio; Ref = referent group.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Experiencing racism was categorized as ever for those who responded "rarely," "sometimes," "most of the time," or "always," and never for those who responded "never."

§ Weighted prevalence estimate.

¶ PR comparing the prevalence of ever experienced racism by racial and ethnic group.

** Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

†† Statistically significant; 95% CIs did not include 1.0.

TABLE 3. Prevalence of selected health risk behaviors, by experiences of racism in school among high school students — Youth Risk Behavior Survey, United States, 2023*

Behavior	Ever experienced racism† Prevalence %§ (95% CI)	Never experienced racism† Prevalence %§ (95% CI)
Mental health		
Current poor mental health	34.8 (31.5–38.2)¶	25.9 (24.1–27.8)
Persistent feelings of sadness or hopelessness	54.3 (51.5–57.1)¶	33.8 (31.8–35.7)
Suicide risk		
Seriously considered attempting suicide	27.8 (25.2–30.6)¶	16.8 (15.3–18.4)
Attempted suicide	15.0 (12.9–17.3)¶	6.7 (5.8–7.8)
Substance use		
Current use of any tobacco product	22.2 (19.9–24.7)¶	15.9 (14.2–17.8)
Current alcohol use	26.4 (24.2–28.6)¶	20.0 (18.1–22.1)
Current marijuana use	21.8 (19.0–24.8)¶	14.5 (13.2–16.0)
Current prescription opioid misuse	8.5 (7.2–10.1)¶	2.6 (2.1–3.2)

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Experiencing racism was categorized as ever for those who responded "rarely," "sometimes," "most of the time," or "always," and never for those who responded "never."

§ Weighted prevalence estimate.

¶ Significantly different from students who report never experiencing racism based on *t*-test analysis with Taylor series linearization ($p<0.05$).

groups, experiencing racism was associated with health risk behaviors and experiences on both the absolute and relative scale, although patterns and strength of associations varied (Tables 4 and 5).

AI/AN, Asian, Black, Hispanic, and multiracial students who reported having ever (versus never) experienced racism in school had a higher prevalence of current poor mental health and persistent feelings of sadness or hopelessness. Among White students, persistent feelings of sadness or hopelessness, but not poor mental health, was significantly higher among those who reported having ever (versus never) experienced racism. Across all racial and ethnic minority groups, the prevalence of seriously considering attempting suicide and suicide attempts during the past year was higher among those who reported having ever (versus never) experienced racism. Among Black, Hispanic, and White students, the prevalence of current use of any tobacco product, alcohol, marijuana, and prescription opioid misuse was higher among students who reported having ever (versus never) experienced racism in school. Multiracial students who reported having experienced racism in school also had a higher prevalence of current use of any tobacco product, marijuana, and prescription opioid misuse.

Discussion

In 2023, approximately one in three high school students across the United States reported that they had ever experienced racism in school, described as unfair treatment in school because of their race or ethnicity. Experiences of racism were two to three times more prevalent among students of color (i.e., AI/AN, Asian, Black, Hispanic, multiracial, and NH/OPI students) compared with White students, with Asian students reporting the highest prevalence of having ever experienced racism. The high prevalence of experiences of racism and associations between racism and health risk behaviors among Asian students in this report align with findings from the 2021 ABES, which used the same question to assess exposure to racism that was used in the 2023 YRBS to provide nationally representative estimates of experiences of racism among high school students during the COVID-19 pandemic (*4*). In 2023, the U.S. Commission on Civil Rights provided a report on the Federal response to anti-Asian racism in the United States, documenting the increasing prevalence of anti-Asian discrimination since the COVID-19 pandemic (https://www.usccr.gov/files/2023-10/fy-2023-se-report.pdf). The report also describes Federal initiatives to increase awareness,

TABLE 4. Prevalence of selected health risk behaviors and experiences of racism in school among high school students, among American Indian or Alaska Native,* Asian,* and Black or African American* high school students — Youth Risk Behavior Survey, United States, 2023†

Behavior	American Indian or Alaska Native*				Asian*				Black or African American *			
	Ever experienced racism§	Never experienced racism§			Ever experienced racism§	Never experienced racism§			Ever experienced racism§	Never experienced racism§		
	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)
Current poor mental health	53.3 (33.0–72.5)	25.2 (15.0–39.3)	2.11†† (1.14–3.92)	28.0§§	27.0 (20.5–34.6)	17.7 (13.0–23.7)	1.52†† (1.11–2.09)	9.3§§	33.2 (29.4–37.3)	22.3 (17.0–28.6)	1.49†† (1.10–2.03)	10.9§§
Persistent feelings of sadness or hopelessness	74.7 (60.7–85.0)	44.5 (29.7–60.3)	1.68†† (1.14–2.48)	30.2§§	43.1 (38.5–47.9)	18.8 (13.3–25.8)	2.30†† (1.62–3.26)	24.3§§	51.1 (47.0–55.2)	29.9 (26.8–33.2)	1.71†† (1.48–1.97)	21.2§§
Seriously considered attempting suicide	42.2 (23.3–63.7)	18.6 (10.1–31.8)	2.27†† (1.08–4.78)	23.6§§	19.7 (16.4–23.5)	6.4 (3.5–11.3)	3.09†† (1.69–5.65)	13.3§§	27.0 (23.0–31.5)	13.4 (11.6–15.4)	2.02†† (1.66–2.44)	13.6§§
Attempted suicide	20.4 (11.1–34.5)	7.5 (3.6–14.7)	2.74†† (1.23–6.10)	13.0§§	11.0 (7.0–17.1)	3.9 (2.1–7.2)	2.81†† (1.48–5.35)	7.1§§	15.2 (12.5–18.5)	4.7 (3.3–6.6)	3.25†† (2.24–4.71)	10.5§§
Current use of any tobacco product	45.5 (25.1–67.6)	25.5 (15.1–39.7)	1.79 (0.91–3.49)	20.0	7.3 (4.6–11.5)	7.1 (2.7–17.6)	1.03 (0.41–2.59)	0.2	21.2 (16.2–27.3)	13.1 (11.0–15.5)	1.62†† (1.27–2.06)	8.1§§
Current alcohol use	31.9 (20.9–45.3)	22.3 (11.7–38.4)	1.43 (0.77–2.64)	9.6	14.1 (10.0–19.6)	10.7 (8.0–14.4)	1.31 (0.86–2.01)	3.4	22.7 (18.2–28.0)	12.3 (10.0–14.9)	1.85†† (1.38–2.49)	10.4§§
Current marijuana use	32.0 (18.7–49.0)	21.3 (12.0–34.7)	1.50 (0.72–3.15)	10.7	7.5 (4.5–12.4)	4.9 (1.8–12.6)	1.55 (0.54–4.42)	2.7	24.1 (18.9–30.1)	12.8 (10.2–15.9)	1.88†† (1.43–2.48)	11.3§§
Current prescription opioid misuse	1.4 (0.6–3.4)	1.3 (0.6–2.8)	1.02 (0.37–2.83)	0.0	6.0 (2.8–12.6	2.9 (1.0–8.3)	2.05 (0.75–5.61)	3.1	6.8 (4.8–9.6)	3.6 (2.5–5.1)	1.92†† (1.20–3.07)	3.3§§

Abbreviations: PD = prevalence difference; PR = prevalence ratio.

* Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

† N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

§ Experiencing racism was categorized as ever for those who responded "rarely," "sometimes," "most of the time," or "always," and never for those who responded "never."

¶ Weighted prevalence estimate.

** PR and PD comparing the prevalence of health risk behaviors and experiences, by ever versus never experiencing racism.

†† Statistically significant; 95% CIs did not include 1.0.

§§ p value for prevalence difference based on *t*-test analysis with Taylor series linearization (<0.05).

prevention, and reporting of anti-Asian discrimination. For example, in 2021, the Office of Juvenile Justice and Delinquency Prevention under the U.S. Department of Justice launched a national initiative to prevent youth hate crimes and identity-based bullying among Asian American and Pacific Islander students (https://ojjdp.ojp.gov/programs/preventing-youth-hate-crimes-bullying-initiative#about-the-initiative). In addition, the U.S. Department of Justice Civil Rights Division and the U.S. Department of Education Office for Civil Rights fact sheet on confronting COVID-19–related harassment in schools provides multiple action steps families can take to work with schools to respond to anti-Asian discrimination among students (https://www.justice.gov/crt/page/file/1392041/dl?inline). Although prevalence estimates of experiences of racism in school were lower across racial and ethnic groups (with the exception of AI/AN students) in the 2023 YRBS compared with the 2021 ABES (*4*), direct comparisons between YRBS and ABES results cannot be made because of differences in methodology (e.g., the ABES was self-administered by students online in various settings).

Previous studies also have found associations between experiences of racism among adolescents and mental health, suicide risk, and substance use. For example, a 2018 meta-analytic review of studies on racial and ethnic discrimination during adolescence demonstrated associations with depressive symptoms and substance use, with the majority of studies using a general measure of experiences of racism that did not specify setting or perpetrator (*9*). Most studies examining associations between self-reported experiences of racism and health among adolescents have focused on mental health (*2*). Strong associations between racism and suicide risk found in this study align with findings from a recent study using ABES data. Using data from students of color, in unadjusted models, students who sometimes, most of the time, or always experienced racism in school had 3.38 times higher odds of seriously considering suicide and 3.87 times higher odds of attempting suicide during the past 12 months compared with students who never experienced racism (*10*). Whereas the current study included students rarely experiencing racism in the comparison group against students never experiencing racism, more frequent experiences of racism might have stronger associations with suicide risk among students (*10*).

Students might be experiencing racism in school because of discrimination and bias that are embedded within current school policies and practices (e.g., disciplinary practices) or as a

TABLE 5. Prevalence of selected health risk behaviors and experiences of racism in school among high school students, among Hispanic or Latino, multiracial,* and White* high school students — Youth Risk Behavior Survey, United States, 2023†

Behavior	Hispanic or Latino*				Multiracial*				White*			
	Ever experienced racism§	Never experienced racism§			Ever experienced racism§	Never experienced racism§			Ever experienced racism§	Never experienced racism§		
	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)	Prevalence %¶ (95% CI)	Prevalence %¶ (95% CI)	PR** (95% CI)	PD** (%)
Current poor mental health	36.1 (31.3–41.2)	19.8 (17.3–22.5)	1.83†† (1.59–2.10)	16.3§§	39.0 (32.8–45.5)	20.6 (16.1–26.0)	1.89†† (1.48–2.41)	18.4§§	36.1 (29.9–42.8)	30.5 (27.8–33.2)	1.18 (0.97–1.44)	5.6
Persistent feelings of sadness or hopelessness	58.5 (54.7–62.2)	32.5 (29.6–35.5)	1.80†† (1.64–1.99)	26.0§§	53.3 (48.2–58.3)	30.7 (23.4–39.1)	1.73†† (1.38–2.18)	22.6§§	55.2 (50.7–59.6)	36.2 (33.7–38.9)	1.52†† (1.39–1.66)	18.9§§
Seriously considered attempting suicide	26.3 (23.7–29.1)	12.9 (10.8–15.3)	2.04†† (1.70–2.45)	13.5§§	30.4 (24.4–37.1)	14.0 (10.1–19.0)	2.17†† (1.56–3.02)	16.4§§	32.3 (26.2–39.0)	19.9 (18.0–21.9)	1.62†† (1.36–1.94)	12.4§§
Attempted suicide	16.7 (13.9–19.9)	7.0 (5.5–9.0)	2.37†† (1.81–3.09)	9.6§§	15.3 (11.1–20.8)	7.6 (4.5–12.6)	2.02†† (1.13–3.63)	7.8§§	12.9 (9.5–17.3)	7.0 (5.8–8.5)	1.84†† (1.35–2.51)	5.9§§
Current use of any tobacco product	22.8 (19.2–26.9)	13.0 (10.9–15.6)	1.75†† (1.44–2.13)	9.8§§	24.3 (18.7–30.9)	14.9 (10.4–20.9)	1.62†† (1.12–2.35)	9.3§§	26.5 (21.9–31.7)	18.2 (15.6–21.2)	1.45†† (1.23–1.72)	8.2§§
Current alcohol use	27.8 (24.1–31.9)	15.4 (13.0–18.2)	1.80†† (1.45–2.24)	12.4§§	24.5 (20.7–28.7)	20.8 (16.0–26.5)	1.18 (0.88–1.57)	3.7	32.0 (27.6–36.7)	24.2 (21.1–27.5)	1.32†† (1.14–1.53)	7.8§§
Current marijuana use	22.4 (18.6–26.7)	13.3 (11.0–16.0)	1.68†† (1.37–2.06)	9.1§§	25.9 (20.8–31.7)	15.6 (11.8–20.3)	1.66†† (1.27–2.17)	10.3§§	21.9 (16.9–27.8)	15.9 (13.8–18.4)	1.37†† (1.12–1.68)	5.9§§
Current prescription opioid misuse	9.8 (7.2–13.1)	3.0 (2.1–4.4)	3.23†† (1.90–5.47)	6.7§§	8.8 (5.6–13.5)	3.1 (1.7–5.6)	2.79†† (1.47–5.29)	5.6§§	8.0 (5.6–11.4)	2.1 (1.6–2.9)	3.76†† (2.44–5.79)	5.9§§

Abbreviation: PD = prevalence difference; PR = prevalence ratio.

* Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

† N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

§ Experiencing racism was categorized as ever for those who responded "rarely," "sometimes," "most of the time," and "always," and never for those who responded "never."

¶ Weighted prevalence estimate.

** PR and PD comparing the prevalence of health risk behaviors and experiences, by ever versus never experiencing racism.

†† Statistically significant; 95% CIs did not include 1.0.

§§ p value for prevalence difference based on *t*-test analysis with Taylor series linearization (<0.05).

result of interactions with students, teachers, or administrators and other staff members (*11*). Schools can implement and maintain policies and practices to prevent and to address experiences of racism occurring in school. Schools can provide professional development to teachers, administrators, and other school staff members to increase their awareness of racism in schools, including personal implicit and explicit biases that might affect their treatment of students, and build skills to intervene when they witness racism (*12*). For example, the San Diego Unified School District has developed the Equity Collective (https://www.sdusdequity.com/whoweare) to provide professional development opportunities for staff members to increase their understanding of how equity, bias, and oppression affect social, emotional, academic, and behavioral outcomes among students. Such professional development can also equip staff members to provide school and community-based resources to support students who have experienced racism (e.g., referrals for mental health treatment and resources for coping behaviors). Training staff members to adopt discipline and teaching strategies that reflect cultural competency and cultural humility might serve to create healthier socioemotional environments for all students and faculty, regardless of race and ethnicity (*13*).

Schools also can promote policies and practices to prevent systemic inequities in treatment that disproportionately affect the mental health and well-being of students of color. For example, in 2023, the U.S. Department of Justice and the U.S. Department of Education released a resource on confronting racial discrimination in student discipline, which documents multiple investigations of discriminatory practices in student discipline on the basis of race and ethnicity and provides proactive solutions to reduce reliance on discipline systems that might be implicitly or explicitly biased to disproportionately affect students from marginalized groups and their mental health (https://www2.ed.gov/about/offices/list/ocr/docs/tvi-student-discipline-resource-202305.pdf). Schools can implement culturally responsive positive behavior interventions and supports as well as participatory problem-solving approaches that engage families and communities (*14*). Seattle Public Schools created the Office of African American Male Achievement (AAMA) in 2019. AAMA works with students, families, and educators to promote school and community environments that promote success of Black boys and teens by cultivating their strengths instead of approaching student behavior from a deficit model, using a framework of systems change rather than student intervention. In addition, schools across the United States have implemented student-led affinity

and intersectional groups for students identifying with racial and ethnic groups who have been marginalized (*15*). Such groups can provide students with an environment to discuss their experiences and develop coping and self-regulation skills, as well as develop a positive social identity and historical and cultural knowledge that affirms and accurately describes their identity. Schools also can ensure access to certified school counselors and social workers as a structural intervention to address harms from racism. CDC provides resources for action to promote mental well-being and prevent mental distress and suicide risk among children and adolescents and strategies that can help mitigate the impact of racism, including Promoting Mental Health and Well-Being in Schools: An Action Guide for School and District Leaders (https://www.cdc.gov/healthyyouth/mental-health-action-guide/index.html), the Suicide Prevention Resource for Action (https://www.cdc.gov/suicide/pdf/preventionresource.pdf), and the Drug-Free Communities Support Program (https://www.cdc.gov/overdose-prevention/php/drug-free-communities/index.html).

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*7*). The findings in this report are subject to at least three additional limitations. First, the variables included in this study reflect different points in time, including a lifetime experience of racism in school compared with health risk behaviors occurring during the past 30 days (e.g., poor mental health and substance use) or the past 12 months (e.g., feelings of sadness or hopelessness or suicide risk). The temporal ordering of when students experienced racism in relation to the health risk behaviors and experiences included in this report cannot be determined because data were collected through a cross-sectional survey and causality between variables cannot be determined. Second, the experience of racism is measured as a single item and might not capture the complexity of all racial and ethnic populations' cultural and structural experiences of racism (*2*). Finally, further disaggregation of students by specific racial and ethnic combinations in future studies might provide additional important insights that are diluted when using one category for students selecting more than one racial or ethnic category. For example, students who selected more than one racial category were categorized as multiracial, and students selecting Hispanic ethnicity were categorized as Hispanic whether they selected one or more racial categories.

Future Directions

The added measure assessing racism in school in the 2023 YRBS questionnaire enables CDC to monitor these experiences among high school students over time. Future studies can examine the relation between experiences of racism in school and other health risk behaviors not included in this report (e.g., poor sleep, physical activity, and dietary behaviors). In-depth studies examining heterogeneity within groups are warranted, as experiences of racism were found to be more prevalent among Asian, female, and LBGQ+ students. For example, although in general, Asian students have a low prevalence of many risk behaviors (https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBS_Data-Summary-Trends_Report2023_508.pdf), a majority of Asian students reported experiencing racism at school in this report and others (*4*). In addition, future studies can investigate additional individual, school, and structural-level factors that might contribute to experiences of racism among students, as well as those that might buffer the negative health behaviors and experiences associated with racism.

In future practice, school districts might consider interventions that create safe and supportive environments by promoting school culture, conditions, and competencies that support equity and anti-racism, as well as healing from experiences of racism. Another important consideration is systems-level changes to policies and practices in schools, such as assessing discipline practices that contribute to unfair treatment, supporting positive identity development, and ensuring access to mental health–related resources (e.g., certified school counselors and social workers).

Conclusion

The findings in this report characterize associations between experiencing racism in school, poor mental health, substance use, and suicide risk for high school students from all racial and ethnic groups. Experiences of racism in school were two to three times more prevalent among AI/AN, Asian, Black, Hispanic, multiracial, and NH/OPI students compared with White students. Such findings highlight the potential benefits of school-based policies and practices that address negative experiences on the basis of race and ethnicity in school. Schools can promote connections to foster positive experiences for all students, including those who have experienced racism. By working to prevent racism in school, schools can serve as a safe and supportive place for all students.

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Jonetta Mpofu reported being a board member of the American School Health Association. No other potential conflicts of interest were disclosed.

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Adverse Childhood Experiences and Health Conditions and Risk Behaviors Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Adverse childhood experiences (ACEs) are preventable, potentially traumatic events occurring before age 18 years. Data on ACEs among adolescents in the United States have primarily been collected through parent report and have not included important violence-related ACEs, including physical, sexual, and emotional abuse. This report presents the first national prevalence of self-reported ACEs among U.S. high school students aged <18 years, estimates associations between ACEs and 16 health conditions and risk behaviors, and calculates population-attributable fractions of ACEs with these conditions and behaviors using cross-sectional, nationally representative 2023 Youth Risk Behavior Survey data. Exposures were lifetime prevalence of individual (emotional, physical, and sexual abuse; physical neglect; witnessed intimate partner violence; household substance use; household poor mental health; and incarcerated or detained parent or guardian) ACEs and cumulative ACEs count (zero, one, two or three, or four or more). Health conditions and risk behaviors included violence risk factors, substance use, sexual behaviors, weight and weight perceptions, mental health, and suicidal thoughts and behaviors. Bivariate analyses assessed associations between individual and cumulative ACEs and demographics. Adjusted prevalence ratios assessed associations between cumulative ACEs and health conditions and risk behaviors, accounting for demographics. Population-attributable fractions were calculated to determine the potential reduction in health conditions and risk behaviors associated with preventing ACEs. ACEs were common, with approximately three in four students (76.1%) experiencing one or more ACEs and approximately one in five students (18.5%) experiencing four or more ACEs. The most common ACEs were emotional abuse (61.5%), physical abuse (31.8%), and household poor mental health (28.4%). Students who identified as female; American Indian or Alaska Native; multiracial; or gay or lesbian, bisexual, questioning, or who describe their sexual identity in some other way experienced the highest number of ACEs. Population-attributable fractions associated with experiencing ACEs were highest for suicide attempts (89.4%), seriously considering attempting suicide (85.4%), and prescription opioid misuse (84.3%). ACEs are prevalent among students and contribute substantially to numerous health conditions and risk behaviors in adolescence. Policymakers and public health professionals can use these findings to understand the potential public health impact of ACEs prevention to reduce adolescent suicidal behaviors, substance use, sexual risk behaviors, and other negative health conditions and risk behaviors and to understand current effects of ACEs among U.S. high school students.

Introduction

Adverse childhood experiences (ACEs) are preventable, potentially traumatic events occurring before age 18 years (*1*). For nearly three decades, considerable research, particularly among adults, has demonstrated the importance of ACEs' contributions to negative health outcomes and diminished life opportunities (*2*,*3*). Retrospective surveys of adults have established that ACEs are prevalent: Approximately two thirds of U.S. adults have experienced at least one ACE and 17% of U.S. adults have experienced four or more ACEs (*4*). Despite the volume of research supporting strong associations between ACEs and negative outcomes in adulthood, relatively few studies have examined the role of ACEs in child and adolescent health (*5*). ACEs are associated with increased likelihood of numerous risk factors and health outcomes, including being in physical fights and carrying weapons (*6*); smoking, alcohol use, and illicit drug use in both adolescence and adulthood (*2*); early sexual initiation, teenage pregnancy, sexually transmitted infections, and multiple sexual partners (*2*); overweight or obesity (*2*); and various mental health conditions or symptoms, as well as suicide risk, across the lifespan (*5*,*7*).

Population-level estimates of ACEs among adolescents and their effects have largely been limited to parent-report

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or a small number of ACEs (*8*). Collecting and analyzing self-reported ACEs data among adolescents is valuable for several reasons, most notably the proximity of the event to the time of report and adolescents' knowledge of their own experiences that might be unknown to or not disclosed by their parents (*9*). Retrospective reports of ACEs on surveys, such as the Behavioral Risk Factor Surveillance System (BRFSS), require adults to recall events that occurred decades ago, introducing the potential for significant recall bias (*9*). Collection of ACE data among adolescents decreases recall bias, improves the ability to track trends in ACEs over time, and permits quicker assessment of the impact of current prevention and mitigation efforts in disproportionately affected populations (*9*). Collection of self-reported ACEs data among adolescents, and not parent-proxy reporters, might improve accuracy of estimates: Adolescent-reported data potentially captures abuse- or neglect-related experiences that might have been perpetrated by the proxy reporters, and sensitive experiences not disclosed by adolescents to their parent.

This report presents the first lifetime national prevalence of self-reported individual and cumulative ACEs among U.S. high school students aged <18 years, associations between cumulative ACE exposure and negative health conditions and risk behaviors in adolescence, and population-attributable fractions related to ACEs for each condition and behavior. Policymakers and public health professionals can use this information to understand current prevalence of ACEs among U.S. high school students, and the proportion of negative health conditions and risk behaviors that could potentially be reduced or eliminated by implementing evidence-based strategies and approaches to prevent ACEs and mitigate their consequences.

Methods

Data Source

This report includes data from the 2023 Youth Risk Behavior Survey (YRBS) (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*8*). Prevalence estimates for ACEs for the overall study population and by sex, race and ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, datasets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

Information about question content and coding for all demographics, ACEs, and included health conditions and risk behaviors is presented (Table 1). Students self-reported lifetime experiences of eight ACEs (emotional, physical, and sexual abuse; physical neglect; witnessing intimate partner violence; household substance use; household poor mental health; and parent or guardian incarcerated or detained). Questions align with and were adapted from the original ACEs included in the seminal CDC-Kaiser Permanente ACEs Study (*3*) and subsequently used for adult retrospective data collection from the BRFSS (*4*). Slight adaptations were made to ACEs questions to align with age of respondent (i.e., changes to the question stem from "before you were 18 years of age" to "during your life"), and to reduce the number of questions used to capture sexual abuse and household substance use. ACEs questions were cognitively tested with high school students to ensure fidelity to question intention and suitability for adolescent populations; cognitive testing results are available (https://stacks.cdc.gov/view/cdc/150784). In addition to examination of the presence of individual ACEs, a cumulative ACEs count (cumulative ACEs) was calculated (zero, one, two or three, or four or more) following CDC guidelines for coding ACEs responses using YRBS data (*10*).

Students also self-reported on 16 measures across a spectrum of risk behaviors and health conditions. These included carrying a weapon at school, being in a physical fight, multiple forms of substance use (i.e., current electronic vapor product use, current alcohol use, current binge drinking, and current prescription opioid misuse), sexual behaviors (i.e., alcohol or drug use before last sexual intercourse, currently sexually active with multiple partners, and did not use a condom during last sexual intercourse), weight and perceived weight status, persistent feelings of sadness or hopelessness, and suicide risk (i.e., seriously considered attempting suicide or attempted suicide). Most questions referenced conditions or behaviors that took place during the past 12 months or past 30 days, increasing the chances that the condition or behavior took place after initial ACE exposure.

Demographic variables included sex (female or male) and race and ethnicity (American Indian or Alaska Native [AI/AN],

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 1. Questions, response options, and analytic coding for health outcomes, risk behaviors, and adverse childhood experiences among high school students aged <18 years, by variable assessed — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Adverse childhood experience			
Emotional abuse	During your life, how often has a parent or other adult in your home insulted you or put you down?	Never, rarely, sometimes, most of the time, or always	Yes (rarely, sometimes, most of the time, or always) versus no (never)
Physical abuse	During your life, how often has a parent or other adult in your home hit, beat, kicked, or physically hurt you in any way?	Never, rarely, sometimes, most of the time, or always	Yes (rarely, sometimes, most of the time, or always) versus no (never)
Sexual abuse	Has an adult or person at least 5 years older than you ever forced you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being made to have sexual intercourse.)	Yes or no	Yes versus no
Physical neglect	During your life, how often has there been an adult in your household who tried hard to make sure your basic needs were met, such as looking after your safety and making sure you had clean clothes and enough to eat?	Never, rarely, sometimes, most of the time, or always	Yes (never or rarely) versus no (sometimes, most of the time, and always)*
Witnessed intimate partner violence	During your life, how often have your parents or other adults in your home slapped, hit, kicked, punched, or beat each other up?	Never, rarely, sometimes, most of the time, or always	Yes (rarely, sometimes, most of the time, or always) versus no (never)
Household substance use	Have you ever lived with a parent or guardian who was having a problem with alcohol or drug use?	Yes or no	Yes versus no
Household poor mental health	Have you ever lived with a parent or guardian who had severe depression, anxiety, or another mental illness, or was suicidal?	Yes or no	Yes versus no
Parent or guardian incarcerated or detained	Have you ever been separated from a parent or guardian because they went to jail, prison, or a detention center?	Yes or no	Yes versus no
Cumulative ACEs count	Cumulative ACEs count = (emotional abuse + physical abuse + sexual abuse + physical neglect + witnessed IPV + household substance use + household poor mental health + incarcerated parent or guardian)	Total count possible is 8†	Categorization for ACEs: 0, 1, 2 or 3, or ≥4
Health outcome or risk behavior			
Carried a weapon at school during the past 30 days	During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?	0 days, 1 day, 2–3 days, 4–5 days, or ≥6 days	Yes (1 day, 2–3 days, 4–5 days, or ≥6 days) versus no (0 days)
Was in a physical fight during the past 12 months	During the past 12 months, how many times were you in a physical fight?	0 times, 1 time, 2–3 times, 4–5 times, 6–7 times, 8–9 times, 10– 11 times, or ≥12 times	Yes (1 time, 2–3 times, 4–5 times, 6–7 times, 8–9 times, 10–11 times, or ≥12 times) versus no (0 times)
Current electronic vapor product use during the past 30 days	During the past 30 days, on how many days did you use an electronic vapor product?	0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes (1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days) versus no (0 days)
Current alcohol use during the past 30 days	During the past 30 days, on how many days did you have at least one drink of alcohol?	0 days, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes (1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days) versus no (0 days)
Current binge drinking during the past 30 days	During the past 30 days, on how many days did you have ≥4 drinks of alcohol in a row, that is, within a couple of hours (if you are female) or ≥5 drinks of alcohol in a row, that is, within a couple of hours (if you are male)?	0 days, 1 day, 2 days, 3–5 days, 6–9 days, 10–19 days, or ≥20 days	Yes (1 day, 2 days, 3–5 days, 6–9 days, 10–19 days, or ≥20 days) versus no (0 days)
Current prescription opioid misuse during the past 30 days	During the past 30 days, how many times did you take prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1–2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes (1–2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times) versus no (0 times)
Alcohol or drug use before last sexual intercourse	Did you drink alcohol or use drugs before you had sexual intercourse the last time?	I have never had sexual intercourse, yes, or no	Yes versus no (no or I have never had sexual intercourse)
Currently sexually active with multiple people during the past 3 months	During the past 3 months, with how many people did you have sexual intercourse?	I have never had sexual intercourse, I have had sexual intercourse, but not during the past 3 months, 1 person, 2 persons, 3 persons, 4 persons, 5 persons, or ≥6 persons	Yes (2 people, 3 people, 4 people, 5 people, or 6 or more people) versus no (I have never had sexual intercourse, I have had sexual intercourse, but not during the past 3 months, or 1 person)
Did not use a condom during last sexual intercourse	The last time you had sexual intercourse, did you or your partner use a condom?	I have never had sexual intercourse, yes, or no	Yes (no [did not use condom]) versus no (yes [used a condom] or I have never had sexual intercourse)

See table footnotes on the next page.

TABLE 1. (*Continued*) Questions, response options, and analytic coding for health outcomes, risk behaviors, and adverse childhood experiences among high school students aged <18 years, by variable assessed — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Underweight	How tall are you without your shoes on? How much do you weigh without your shoes on?	Numeric entry of height in feet and inches; weight in pounds	BMI calculated <5th percentile using self-reported height and weight[§]
Overweight or obesity	How tall are you without your shoes on? How much do you weigh without your shoes on?	Numeric entry of height in feet and inches; weight in pounds	BMI calculated ≥85th percentile using self-reported height and weight[§]
Self-perceived to be underweight	How do you describe your weight?	Very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight	Self-perceived underweight (very underweight or slightly underweight) versus self-perceived "about the right" weight
Self-perceived to be overweight	How do you describe your weight?	Very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight	Self-perceived overweight (slightly overweight or very overweight) versus self-perceived "about the right" weight
Persistent feelings of sadness or hopelessness during the past 12 months	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Seriously considered attempting suicide during the past 12 months	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no
Attempted suicide during the past 12 months	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2–3 times, 4–5 times, or ≥6 times	Yes (1 time, 2–3 times, 4–5 times, or ≥6 times) versus no (0 times)

Abbreviations: ACEs = adverse childhood experiences; BMI = body mass index.

* Physical neglect is reverse coded and includes both "never" and "rarely" to align with previously published measures of neglect. https://www.cdc.gov/violenceprevention/aces/ace-brfss.html

† Cumulative ACE count calculated only for participants with complete data on at least five individual ACEs.

§ BMI for each student was calculated from self-reported height and weight and then an obesity indicator and an overweight indicator were categorized based on sex- and age-specific reference data from the 2000 CDC Extended BMI-for-Age Growth Charts. https://www.cdc.gov/growthcharts/clinical_charts.htm

Asian, Black or African American [Black], White, Hispanic or Latino [Hispanic], and multiracial [selected >1 racial category]). (Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.) Prevalence estimates for Native Hawaiian or other Pacific Islander students had denominators <30 and were therefore considered statistically unreliable and were suppressed (*8*). Other demographic variables included age (≤14, 15, 16, and 17 years), and sexual identity (heterosexual, gay or lesbian, bisexual, questioning [I am not sure about my sexual identity/questioning], or describe identity in some other way [I describe my identity some other way]).

Analysis

The analytic sample was restricted to those aged <18 years (n = 17,838) to ensure the adversity occurred during childhood. Weighted prevalence and 95% CIs for individual and cumulative ACEs count, overall and by each demographic, are presented. Demographic differences in the prevalence of individual ACEs and cumulative ACEs count were examined using pairwise *t*-test analyses. All prevalence estimates and measures of association used Taylor series linearization. Cumulative ACEs counts were only calculated for participants with complete data on at least five individual ACEs.

The weighted prevalence and 95% CI of each health condition and risk behavior by cumulative ACEs count are presented. Adjusted prevalence ratios (aPRs) were calculated using logistic regression with predicted marginals; models fit cumulative ACEs count as the independent variable and each risk behavior or health condition as the dependent variable, adjusting for sex, race and ethnicity, age, and sexual identity. Population-attributable fractions, adjusted for aforementioned model covariates, were calculated using Miettinen's formula, aPRs, and weighted prevalence estimates of each health condition and risk behavior by each cumulative ACEs count level (Supplementary Table, https://stacks.cdc.gov/view/cdc/160323). These population-attributable fractions were used to ascertain the percentage reduction in the number of observed cases of each outcome that would be expected if ACEs exposure were incrementally reduced or eliminated in the study population (*7*,*11*). Findings were considered statistically significant if $p<0.05$. Prevalence ratios were considered statistically significant if 95% CI did not cross the value of 1.0. All analyses except estimates of population-attributable fractions were conducted in SAS-callable SUDAAN (version 11.0.3; RTI International) using sample weights to account for complex survey design.

TABLE 2. Lifetime prevalence of individual types of adverse childhood experiences among high school students aged <18 years, by sociodemographic characteristics — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Weighted % (95% CI)	Adverse childhood experience category weighted % (95% CI)							
		Emotional abuse % (95% CI)	Physical abuse % (95% CI)	Sexual abuse % (95% CI)	Physical neglect % (95% CI)	Witnessed IPV % (95% CI)	Household substance use % (95% CI)	Household poor mental health % (95% CI)	Parent or guardian incarcerated or detained % (95% CI)
Sex									
Female	48.5 (46.4–50.7)	69.1 (66.1–72.0)	34.1 (31.6–36.7)	11.8 (10.5–13.1)	8.4 (6.6–10.7)	23.1 (21.0–25.3)	29.7 (27.2–32.4)	35.5 (32.9–38.2)	15.9 (13.5–18.5)
Male	51.5 (49.3–53.6)	54.3 (51.3–57.3)†	29.7 (27.2–32.4)†	2.7 (2.0–3.7)†	10.1 (8.3–12.2)†	14.4 (12.7–16.4)†	20.7 (18.4–23.2)†	21.7 (19.5–24.2)†	13.2 (11.1–15.7)†
Race and ethnicity§									
American Indian or Alaska Native	0.4 (0.2–0.5)	56.5 (33.2–77.3)	35.7 (19.6–55.9)	7.2 (3.4–14.9)	8.0 (3.4–17.5)	28.7 (15.8–46.5)	34.2 (18.3–54.5)¶	29.9 (16.0–48.9)	17.4 (9.7–29.4)¶
Asian	4.3 (2.9–6.4)	66.0 (60.7–71.0)**,††	38.2 (32.6–44.2)§§	4.3 (2.4–7.8)††	7.4 (4.7–11.6)**,††	17.1 (13.7–21.1)¶¶	12.4 (8.4–18.0)††,§§,¶¶	13.2 (9.2–18.7)**,††,§§,¶¶	4.6 (2.2–9.4) **,††,§§,¶¶
Black or African American	13.4 (9.3–18.9)	55.6 (48.8–62.1)***,†††	38.2 (30.9–46.0)***	6.1 (4.6–7.9)§§§	12.0 (9.2–15.5)***,†††	18.6 (16.2–21.3)†††	16.1 (14.3–18.1)***,†††,§§§	19.1 (16.9–21.4)***,†††,§§§	17.0 (14.3–20.0)***
White	47.3 (40.6–54.1)	65.4 (62.3–68.4)	27.0 (24.9–29.1)	6.3 (4.9–8.1)	7.4 (5.7–9.6)	17.2 (15.0–19.5)	29.2 (26.0–32.6)	33.3 (29.9–36.9)	12.6 (10.3–15.3)
Hispanic or Latino	27.9 (23.2–33.3)	57.3 (53.9–60.7)¶¶¶,****	33.6 (30.6–36.7)¶¶¶	9.1 (8.1–10.2)¶¶¶	12.1 (9.6–15.2)¶¶¶,****	19.4 (17.0–21.9)****	24.8 (21.8–28.1)¶¶¶	27.0 (23.9–30.4)¶¶¶,****	16.8 (14.0–19.9)¶¶¶
Multiracial	6.3 (4.5–8.7)	67.0 (60.4–73.0)	37.5 (33.3–42.0)††††	8.2 (5.9–11.2)	6.0 (4.0–8.9)	25.4 (21.3–29.9)††††	28.2 (23.1–33.9)	37.1 (31.5–43.0)	20.1 (14.2–27.6)††††
Age, yrs									
≤14	14.3 (12.6–16.1)	62.7 (58.0–67.1)	31.9 (28.1–36.0)	7.4 (6.3–8.8)	10.0 (7.7–12.9)	17.4 (14.7–20.4)	21.3 (17.8–25.4)§§§§,¶¶¶¶	24.7 (21.5–28.1)¶¶¶¶,*****	12.9 (10.3–15.9)
15	28.7 (27.0–30.3)	59.1 (56.5–61.7)†††††	30.9 (28.4–33.6)	6.4 (5.2–7.8)	8.0 (6.5–9.9)†††††	18.4 (16.2–20.7)	24.7 (22.4–27.2)	29.0 (26.2–31.8)	14.1 (11.9–16.5)
16	29.4 (27.9–31.0)	61.0 (57.1–64.7)	33.3 (30.3–36.5)	7.0 (5.6–8.7)	9.5 (7.4–12.0)	18.2 (16.1–20.6)	26.1 (23.1–29.3)	27.8 (24.7–31.3)	15.2 (12.7–18.1)
17	27.6 (26.1–29.2)	63.9 (59.7–67.8)	31.2 (28.2–34.4)	7.6 (6.2–9.2)	10.2 (7.9–13.0)	19.9 (17.1–23.1)	26.4 (23.6–29.5)	30.3 (26.8–34.0)	15.1 (12.5–18.2)
Sexual identity									
Heterosexual	74.9 (72.6–77.1)	56.3 (53.8–58.8)§§§§§,¶¶¶¶,******,††††††	28.3 (26.3–30.4)§§§§§,¶¶¶¶,******,††††††	4.1 (3.5–4.7)§§§§§,¶¶¶¶,******,††††††	8.6 (7.7–9.6)¶¶¶¶,******	14.8 (13.8–16.0)§§§§§,¶¶¶¶,******,††††††	20.5 (18.7–22.5)§§§§§,¶¶¶¶,******,††††††	22.4 (20.6–24.3)§§§§§,¶¶¶¶,******,††††††	12.0 (10.6–13.6)§§§§§,¶¶¶¶,******,††††††
Gay or lesbian	4.1 (3.6–4.7)	77.0 (69.0–83.4)§§§§§§	40.3 (34.3–46.6)	10.0 (6.6–14.9¶¶¶¶¶¶	9.7 (6.1–14.9)§§§§§§	26.7 (22.7–31.1)*******	30.1 (24.2–36.8)§§§§§§,¶¶¶¶¶¶	42.0 (34.7–49.8)§§§§§§	17.6 (12.7–23.9)
Bisexual	11.8 (10.7–13.1)	81.5 (78.2–84.3)	46.0 (42.9–49.1)	19.6 (16.6–23.1)†††††††	6.8 (5.3–8.7)§§§§§§§	29.1 (25.1–33.4)†††††††	40.6 (36.3–45.0)†††††††	48.9 (45.1–52.8)	19.4 (15.4–24.2)
Questioning	4.7 (4.1–5.4)	78.8 (73.1–83.6)	43.9 (37.3–50.7)	12.6 (9.4–16.7)	7.0 (4.4–11.0)	20.5 (16.7–24.9)¶¶¶¶¶¶¶	31.7 (25.8–38.3)¶¶¶¶¶¶¶	42.5 (36.1–49.3)¶¶¶¶¶¶¶	16.7 (13.0–21.2)
Describe identity in some other way	4.5 (3.8–5.2)	85.0 (79.2–89.4)	48.0 (39.5–56.6)	17.7 (10.2–28.8)	3.9 (2.1–7.0)	31.2 (24.3–39.1)	43.0 (34.2–52.1)	56.4 (46.6–65.7)	20.6 (13.6–29.9)
Total	—	**61.5 (58.8–64.1)**	**31.8 (29.7–34.0)**	**7.1 (6.3–7.9)**	**9.3 (7.6–11.4)**	**18.6 (17.0–20.4)**	**25.1 (22.9–27.4)**	**28.4 (26.0–30.9)**	**14.5 (12.4–16.9)**

See table footnotes on the next page.

Results

The most common ACEs were emotional abuse (61.5%), physical abuse (31.8%), and household poor mental health (28.4%) (Table 2). Experiences of specific ACEs varied by demographic characteristics. All ACEs, except physical neglect, were more common among female students compared with male students. Unique patterns were observed by race and ethnicity for individual ACEs. For example, AI/AN students had the highest prevalence of witnessed intimate partner violence (28.7%) and household substance use (34.2%) but one of the lowest prevalence estimates of physical abuse (35.7%). Asian students had the lowest prevalence of sexual abuse (4.3%), witnessed intimate partner violence (17.1%), household substance use (12.4%), household poor mental health (13.2%), and parent or guardian incarcerated or detained (4.6%), but had the highest prevalence of physical abuse (38.2%), along with Black students (38.2%). Prevalence differed by age for four out of eight ACEs; household substance use and household poor mental health were more commonly reported by students aged 17 years (26.4% and 30.3%, respectively) compared with students aged ≤14 years (21.3% and 24.7%,

TABLE 2. (*Continued*) Lifetime prevalence of individual types of adverse childhood experiences among high school students aged <18 years, by sociodemographic characteristics — Youth Risk Behavior Survey, United States, 2023*

Abbreviation: IPV = intimate partner violence.

* N = 17,838 respondents aged <18 years. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Male students significantly differed from female students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶ American Indian or Alaska Native students significantly differed from Asian students, based on *t*-test analysis with Taylor series linearization (p<0.05).

** Asian students significantly differed from Black or African American students, based on *t*-test analysis with Taylor series linearization (p<0.05).

†† Asian students significantly differed from Hispanic or Latino students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§ Asian students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶ Asian students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

*** Black or African American students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

††† Black or African American students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§ Black or African American students significantly differed from Hispanic or Latino students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶ Hispanic or Latino students significantly differed from White students (p<0.05).

**** Hispanic or Latino students significantly differed from multiracial students (p<0.05).

†††† Multiracial students significantly differed from White students (p<0.05).

§§§§ Students aged ≤14 years significantly differed from students aged 16 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶ Students aged ≤14 years significantly differed from students aged 17 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

***** Students aged ≤14 years significantly differed from students aged 15 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

††††† Students aged 15 years significantly differed from students aged 17 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§ Heterosexual students significantly differed from gay or lesbian students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶ Heterosexual students significantly differed from bisexual students, based on *t*-test analysis with Taylor series linearization (p<0.05).

****** Heterosexual students significantly differed from students who describe their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

†††††† Heterosexual students significantly differed from students with who were questioning, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§§ Gay or lesbian students significantly differed from students who describe their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶¶ Gay or lesbian students significantly differed from bisexual students, based on *t*-test analysis with Taylor series linearization (p<0.05).

******* Gay or lesbian students significantly differed from questioning students, based on *t*-test analysis with Taylor series linearization (p<0.05).

††††††† Bisexual students significantly differed from questioning students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§§§ Bisexual students significantly differed from students who describe their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶¶¶ Students who describe their identity in some other way significantly differed from students who were questioning, based on *t*-test with Taylor series linearization (p<0.05).

respectively). Students who identified as gay, lesbian, bisexual, or questioning (LGBQ+) had higher prevalence of all ACEs except physical neglect compared with heterosexual students. Heterosexual students (8.6%) experienced a higher prevalence of physical neglect than bisexual students (6.8%) and students who describe their identity in some other way (3.9%). Bisexual students experienced a higher prevalence of sexual abuse (19.6%) and household substance use (40.6%) compared with gay and lesbian students (10.0% and 30.1%, respectively). Students who describe their identity in some other way had higher prevalence of emotional abuse (85.0%), household substance use (43.0%), and household poor mental health (56.4%) compared with gay and lesbian students (77.0%, 30.1%, and 42.0%, respectively).

Three in four students (76.1%) experienced at least one ACE and nearly one in five (18.5%) experienced four or more ACEs (Table 3). The prevalence of four or more ACEs was highest in female (23.9%), AI/AN (28.1%), multiracial (25.9%), and LGBQ+ students, particularly students who describe their identity in some other way (38.6%) and bisexual students (35.1%). AI/AN students had the highest prevalence of experiencing zero ACEs (30.9%).

As the number of ACEs increased for most conditions and behaviors, aPRs between cumulative ACEs count and health condition or risk behavior increased in magnitude, indicative of a dose-response relation (Table 4). For 10 of 16 conditions and behaviors, those experiencing one ACE had significantly higher prevalence of each health condition or risk behavior than those experiencing zero ACEs. Students who experienced two or more ACEs had significantly higher prevalence of almost all conditions and behaviors compared with students with zero ACEs (excluding underweight and overweight or obesity for two or three ACEs and underweight for four or more ACEs). The strongest associations were observed between experiencing four or more ACEs and attempted suicide, seriously considered attempting suicide, and current prescription opioid misuse.

Population-attributable fractions due to ACEs (the potential reduction in each outcome if ACEs were reduced or eliminated in the study population) ranged greatly depending on the outcome and ACEs count (Table 5). The largest potential reductions were estimated among students with four or more ACEs across all health conditions and risk behaviors (range of –6.7% [underweight] to 77.8% [attempted suicide]). The estimated overall potential percentage reductions in negative health conditions and risk behaviors associated with preventing all ACEs (one or more ACE) ranged from 4.2% for overweight or obesity to 89.4% for attempted suicide, with population-attributable fractions exceeding 50% for all conditions and behaviors except those related to weight. Substantial reductions associated with preventing all ACEs were estimated for seriously considered attempting suicide (85.4%), current prescription opioid misuse (84.3%), alcohol or drug use before last sexual intercourse (80.2%), current electronic vapor product use (73.2%), persistent feelings of sadness or hopelessness (65.6%), carrying a weapon at school (65.2%), current binge drinking (64.5%), and not using a condom during last sexual intercourse (64.0%).

TABLE 3. Cumulative adverse childhood experiences among high school students aged <18 years, by sociodemographic characteristics — Youth Risk Behavior Survey, United States, 2023

Characteristic	Cumulative adverse childhood experiences* weighted % (95% CI)			
	0 % (95% CI)	1 % (95% CI)	2 or 3 % (95% CI)	≥4 % (95% CI)
Sex				
Female	18.3 (16.4–20.3)	23.8 (21.9–25.7)	34.1 (31.6–36.6)	23.9 (21.7–26.2)
Male	29.3 (27.1–31.6)†	25.0 (23.3–26.7)	32.5 (30.1–34.9)	13.3 (11.3–15.6)†
Race and ethnicity§				
American Indian or Alaska Native	30.9 (10.8–62.3)	16.8 (7.8–32.5)	24.2 (12.4–41.9)	28.1 (14.8–46.9)¶
Asian	26.3 (21.6–31.6)**	24.8 (20.1–30.1)	37.7 (33.2–42.4)**	11.3 (7.9–15.8)**,††,§§,¶¶
Black or African American	25.6 (21.7–30.0)***	21.9 (18.7–25.5)†††	36.7 (32.0–41.8)†††	15.7 (13.2–18.6)***
White	23.3 (20.8–26.0)	25.7 (23.8–27.7)	32.0 (29.5–34.6)	19.0 (16.2–22.1)
Hispanic or Latino	24.5 (22.1–27.0)§§§	23.0 (21.1–25.1)¶¶¶	33.4 (31.0–35.8)	19.1 (16.5–22.0)§§§
Multiracial	16.7 (13.1–20.9)****	25.5 (21.4–30.1)	32.0 (27.4–36.9)	25.9 (22.7–29.3)****
Age, yrs				
≤14	23.7 (20.5–27.3)	26.4 (21.8–31.5)	33.9 (30.4–37.7)	16.0 (13.3–19.1)††††
15	26.2 (24.1–28.5)§§§§	22.8 (21.1–24.7)	32.7 (30.6–35.0)	18.2 (16.2–20.3)
16	23.0 (19.8–26.5)	24.8 (22.6–27.1)	34.1 (30.8–37.5)	18.2 (15.6–21.1)
17	22.5 (19.8–25.3)	24.5 (22.8–26.4)	32.8 (30.1–35.5)	20.3 (17.2–23.7)
Sexual identity				
Heterosexual	28.2 (26.3–30.3)¶¶¶¶,*****,†††††,§§§§§	26.5 (25.2–27.8)*****,†††††	32.0 (30.2–33.8)¶¶¶¶,*****,§§§§§	13.3 (12.1–14.6)¶¶¶¶,*****,†††††,§§§§§
Gay or lesbian	9.8 (6.4–14.9)	20.3 (14.5–27.8)	44.1 (35.7–53.0)	25.7 (20.7–31.4)¶¶¶¶¶,******
Bisexual	9.3 (7.7–11.1)	18.4 (15.8–21.3)†††††††	37.2 (33.0–41.6)	35.1 (31.7–38.6)†††††††
Questioning	10.0 (6.6–14.7)	22.9 (19.5–26.6)§§§§§§	40.9 (36.0–45.9)	26.3 (21.9–31.3)§§§§§§
Describe identity in some other way	9.0 (5.6–14.0)	15.0 (9.6–22.7)	37.3 (29.7–45.6)	38.6 (29.9–48.2)
Total	**23.9 (22.0–25.8)**	**24.4 (23.1–25.7)**	**33.3 (31.4–35.2)**	**18.5 (16.5–20.6)**

Abbreviation: ACEs = adverse childhood experiences.

* Cumulative ACEs counts were only calculated for participants with complete data on at least five individual ACEs (N = 11,871). The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Male students significantly differed from female students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶ American Indian or Alaska Native students significantly differed from Asian students, based on *t*-ztest analysis with Taylor series linearization (p<0.05).

** Asian students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

†† Asian students significantly differed from Black or African American students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§ Asian students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶ Asian students significantly differed from Hispanic or Latino students, based on *t*-test analysis with Taylor series linearization (p<0.05).

*** Black or African American students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

††† Black or African American students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§ Hispanic or Latino students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶ Hispanic or Latino students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

**** Multiracial students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

†††† Students aged ≤14 years significantly differed from students aged 17 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§ Students aged 15 years significantly differed from students aged 17 years, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶ Heterosexual students significantly differed from gay and lesbian students, based on *t*-test analysis with Taylor series linearization (p<0.05).

***** Heterosexual students significantly differed from bisexual students, based on *t*-test analysis with Taylor series linearization (p<0.05).

††††† Heterosexual students significantly differed from students who describe their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§ Heterosexual students significantly differed from students with who were questioning, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶ Gay or lesbian students significantly differed from bisexual students, based on *t*-test analysis with Taylor series linearization (p<0.05).

****** Gay or lesbian students significantly differed from students who describe their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

††††††† Bisexual students significantly differed from students who were questioning, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§§ Students who were questioning significantly differed from students who described their identity some other way, based on *t*-test analysis with Taylor series linearization (p<0.05).

TABLE 4. Associations between adverse childhood experiences score and health conditions and health risk behaviors among high school students aged <18 years — Youth Risk Behavior Survey, United States, 2023

Outcome[†]	Cumulative adverse childhood experiences*		
	1 (versus 0) Adjusted prevalence ratio[§] (95% CI)	2 or 3 (versus 0) Adjusted prevalence ratio[§] (95% CI)	≥4 (versus 0) Adjusted prevalence ratio[§] (95% CI)
Violence risk factor			
Carried a weapon at school	1.57 (0.93–2.64)	2.08 (1.49–2.91)[¶]	4.30 (2.76–6.70)[¶]
Was in a physical fight	1.26 (1.03–1.55)[¶]	2.06 (1.73–2.46)[¶]	3.10 (2.60–3.69)[¶]
Substance use			
Current electronic vapor product use	1.72 (1.41–2.10)[¶]	2.92 (2.26–3.78)[¶]	5.26 (4.10–6.76)[¶]
Current alcohol use	1.30 (1.06–1.60)[¶]	1.91 (1.54–2.36)[¶]	2.67 (2.06–3.45)[¶]
Current binge drinking	1.58 (1.13–2.19)[¶]	2.32 (1.74–3.08)[¶]	4.01 (2.80–5.75)[¶]
Current prescription opioid misuse	2.23 (1.32–3.78)[¶]	3.91 (2.18–7.02)[¶]	8.95 (4.98–16.08)[¶]
Sexual risk behavior			
Alcohol or drug use before last sexual intercourse	1.90 (1.00–3.64)	2.48 (1.55–3.97)[¶]	7.16 (4.55–11.27)[¶]
Currently sexually active with multiple people	1.19 (0.69–2.08)	1.51 (1.03–2.22)[¶]	3.96 (2.48–6.32)[¶]
Did not use a condom during last sexual intercourse	1.28 (0.94–1.75)	2.03 (1.62–2.54)[¶]	4.03 (2.97–5.47)[¶]
Weight			
Underweight	1.27 (0.80–2.01)	0.89 (0.54–1.46)	0.62 (0.37–1.02)
Overweight or obesity	0.91 (0.79–1.06)	1.01 (0.90–1.12)	1.21 (1.07, 1.37)[¶]
Self-perceived to be underweight	1.20 (1.01–1.42)[¶]	1.37 (1.21–1.55)[¶]	1.56 (1.32–1.85)[¶]
Self-perceived to be overweight	1.13 (0.98–1.30)	1.31 (1.13–1.51)[¶]	1.55 (1.37–1.76)[¶]
Mental health and suicide-related behavior			
Persistent feelings of sadness or hopelessness	1.94 (1.69–2.22)[¶]	2.75 (2.41–3.14)[¶]	3.81 (3.28–4.42)[¶]
Seriously considered attempting suicide	2.99 (2.17–4.11)[¶]	5.09 (3.71–7.00)[¶]	9.15 (6.86–12.21)[¶]
Attempted suicide	2.20 (1.26–3.84)[¶]	5.22 (3.34–8.17)[¶]	12.42 (7.47–20.65)[¶]

Abbreviations: ACEs = adverse childhood experiences; YRBS = Youth Risk Behavior Survey.

* Cumulative ACEs counts were only calculated for participants with complete data on at least five individual ACEs (N = 11,871); the referent group includes those students with zero ACEs. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency.

† Because YRBS questionnaires differ by jurisdiction, students are not asked all national YRBS questions. Therefore, the total number of students included in each model varied.

§ Adjusted for sex, race and ethnicity, age, and sexual identity.

¶ Statistically significant; 95% CIs do not cross the null value of 1.0.

Discussion

This study is the first to present self-reported, nationally representative estimates of ACEs among U.S. high school students. ACEs were common among students, exceeding previous estimates from U.S. adults (*4*): Three in four students experienced one or more ACE and nearly one in five students experienced four or more ACEs. Approximately 60% of students experienced emotional abuse during their lifetime (61.5%) and approximately one in three (31.8%) experienced physical abuse. More than one in four students live in a household that has been affected by substance use (25.1%) or poor mental health (28.4%). Approximately one in five students has witnessed intimate partner violence (18.6%), and one in seven has had a parent or guardian incarcerated or detained (14.5%). Students who identified as female, AI/AN, multiracial, or LGBQ+ experienced the highest prevalence of ACEs. Results indicate that preventing and mitigating ACEs is critical to improving population-level adolescent behavioral health: Nearly 90% of suicidal behaviors, 84.3% of current prescription opioid misuse, and 65.6% of persistent feelings of sadness or hopelessness were associated with experiencing one or more ACE. Students with four or more ACEs had significantly increased prevalence ratios for 15 of 16 negative health conditions and risk behaviors compared with students with zero ACEs (e.g., aPR for attempted suicide = 12.42), demonstrating the marked association between cumulative ACEs and negative outcomes.

Results highlight the wide variety of individual student experiences across and within racial and ethnic groups. For example, although AI/AN students had the highest prevalence of four or more ACEs, they also had the highest prevalence of zero ACEs. Specific ACEs most prevalent among students differed by racial and ethnic identity, consistent with previous studies (*12*). For example, although Asian students had the lowest prevalence of four or more ACEs, they experienced comparatively high prevalence of emotional and physical abuse. Significantly fewer multiracial students experienced zero ACEs compared with all other racial and ethnic groups, except when compared to AI/AN students. Taken together, these findings indicate important racial and ethnic disparities in exposure to individual and cumulative ACEs. Variability of individual ACEs by racial and ethnic identity indicates that approaches designed to prevent or address the impact of ACEs

TABLE 5. Population-attributable fractions for health conditions or risk behaviors among high school students aged <18 years, by cumulative adverse childhood experiences — Youth Risk Behavior Survey, United States, 2023

Health condition or risk behavior	Cumulative adverse childhood experiences*			
	1 ACE Population-attributable fraction,† %	2 or 3 ACEs Population-attributable fraction,† %	≥4 ACEs Population-attributable fraction,† %	Any ACE (≥1 ACE)
Weapon carrying and violence				
Carried a weapon at school	3.3	8.8	53.1	65.2
Was in a physical fight	2.2	13.9	37.3	53.4
Substance use				
Current electronic vapor product use	3.1	13.5	56.6	73.2
Current alcohol use	2.9	12.4	33.8	49.2
Current binge drinking	3.6	11.9	48.9	64.5
Current prescription opioid misuse	2.7	10.6	71.0	84.3
Sexual behavior				
Alcohol or drug use before last sexual intercourse	2.6	5.6	72.0	80.2
Currently sexually active with multiple persons	1.3	3.9	56.1	61.3
Did not use a condom during last sexual intercourse	1.6	8.9	53.5	64.0
Weight				
Underweight	9.1	−2.6	−6.7	−0.2
Overweight or obesity	−1.8	0.2	5.8	4.2
Self-perceived to be underweight	3.4	7.3	13.7	24.3
Self-perceived to be overweight	2.3	6.3	13.7	22.3
Mental health and suicide-related behavior				
Persistent feelings of sadness or hopelessness	6.1	17.7	41.8	65.6
Seriously considered attempting suicide	4.2	16.1	65.1	85.4
Attempted suicide	1.1	10.6	77.8	89.4

Abbreviation: ACEs = adverse childhood experiences.

* Cumulative ACEs counts were only calculated for participants with complete data for at least five individual ACEs (N = 11,871); the referent group includes those students with zero ACEs. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency.

† Population-attributable fraction calculated using Miettinen's formula and weighted after adjusting for sex, race and ethnicity, age, and sexual identity.

might benefit from being tailored to specific cultural contexts, as opposed to a one-size-fits-all approach.

Although LGBQ+ students experienced a higher prevalence of ACEs than heterosexual students, bisexual students also experienced a disproportionate prevalence of certain ACEs compared with gay and lesbian students. These findings align with previous research, though the reason for the disproportionate prevalence of ACEs among bisexual students compared with gay and lesbian students remains unclear and needs to be further explored to guide prevention efforts (*13*). Students who described their sexual identity in some other way demonstrated the highest prevalence of four or more ACEs, significantly higher than heterosexual, gay and lesbian, and questioning students; these findings support the need to better understand this population of students and their prevention and intervention needs.

Female students had significantly higher prevalence of four or more ACEs than male students and had higher prevalence of all individual types of ACEs except for physical neglect. Although certain ACEs (e.g., physical and sexual abuse) might reflect directed violence based on their sex, other ACEs (e.g., household poor mental health) might instead reflect a greater awareness of household challenges among female students compared with male students.

Although it might be expected that older students would have experienced a greater number of ACEs than younger students, this study found only a modest increase between students aged ≤14 years and those aged 17 years. The only two ACEs that significantly increased between those aged ≤14 years and those aged 17 years were household substance use and household poor mental health, which more likely reflects greater awareness of household challenges among older adolescents than a true increase in prevalence. This supports the approach that preventing ACEs earlier in childhood helps to prevent negative impacts in adolescence and beyond.

Results from this study expand upon previous research indicating that preventing ACEs could result in sizable reductions in poor health conditions and risk behaviors among adult populations (*7*). However, this study is the first to document the critical, widespread contribution that preventing ACEs could have on reducing a wide spectrum of poor behavioral health conditions and risk behaviors among adolescents. With a high association of ACEs with attempted suicide (89.4%), with current prescription opioid misuse (84.3%), and with persistent feelings of sadness or hopelessness

(65.6%), preventing ACEs could be a clear pathway to improving adolescent behavioral health amid an ongoing mental health crisis (*5*).

Students experiencing high cumulative (four or more) ACEs had significantly higher prevalence of overweight or obesity, consistent with previous studies linking ACEs with obesity (*2*). Such findings suggest the need to incorporate ACEs prevention and mitigation into interventions and policies that aim to address childhood obesity, such as incorporating social workers into family healthy weight programs to assist families in accessing benefit programs (e.g., Supplemental Nutrition Assistance Program or Women, Infants, and Children) that might alleviate financial stress and promote food security, and integration of Substance Abuse and Mental Health Services Administration's guiding principles for trauma-informed care into behavioral interventions for weight (*14*).

Preventing ACEs is important because all children deserve to have safe, stable, nurturing relationships and environments in childhood so that they can flourish and thrive; experiencing abuse and neglect and witnessing violence disrupt that safety, stability, and nurturing. However, these findings suggest that preventing ACEs also is an important public health goal because many other health problems could be eliminated or reduced when ACEs are prevented (*7*). Preventing ACEs is possible and achievable, and CDC's Preventing Adverse Childhood Experiences Resource for Action outlines six strategies for preventing ACEs and mitigating their negative consequences based on the best available evidence (*1*). This resource outlines approaches for advancing each strategy, with examples of evidence-based programs, policies, and practices for each approach. Strategies include increasing economic supports for families, promoting social norms that protect against ACEs, ensuring a strong start for children, teaching skills, and connecting youth to caring adults and activities. Tailored approaches to address the most prevalent ACEs experienced by U.S. high school students are needed. Examples include promoting of parenting skills and family relationship approaches to prevent emotional abuse, providing high-quality childcare to reduce risk for physical abuse and improve household mental health, and offering family-centered treatment for substance use disorders (*1*). Because more than three fourths of U.S. high school students have experienced ACEs, intervening to lessen long-term harms of ACEs is critical for improving public health. Policymakers and public health professionals in states and communities that implement evidence-based approaches to advance these strategies could prevent ACEs among children, and this study's findings suggest that preventing ACEs might also translate into sizable reductions in suicidal behaviors, substance use, sexual risk behaviors, violence, and persistent feelings of sadness and hopelessness when these children reach adolescence.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*8*). The findings in this report are subject to at least four additional limitations. First, although the eight ACEs categories measured on the YRBS are consistent with traditional measures of ACEs (*3*), these categories do not capture all potentially traumatic experiences in childhood or characteristics such as intensity or severity of the experience, which might have implications for health conditions and risk behaviors. This study dichotomized ACEs exposures; future studies could use available responses to explore the nuances of ACEs frequency on conditions and behaviors. Second, these data are cross-sectional. Whereas the ACEs questions measure lifetime occurrence and most conditions and behaviors of interest reflect current (past 30 days) or past-year experiences, for certain persons, ACEs might not have occurred before the outcome of interest. These effects, although strong and consistent, are correlative in nature and should not be interpreted as causal associations between ACEs and included risk behaviors and health conditions. Third, social determinants of health and other related risk factors that contribute to both ACEs and health conditions and risk behaviors could not be assessed, but these social and structural conditions shape the contexts in which adolescents live, play, and learn. Not analyzing these factors could lead to inaccurate estimations of the relations between ACEs and conditions and behaviors because the survey did not include underlying factors with strong influence on the context that shapes adolescents' lives and communities. Finally, adolescents who have experienced multiple ACEs might be more likely to be engaged with the juvenile justice system, unstably housed, or to miss school frequently (*15*), all of which could affect their opportunity to participate in the school-based YRBS. As a result, estimates for ACEs might be underreported.

Future Directions

The findings in this report highlight the importance of preventing ACEs for adolescent well-being and as a prevention and reduction strategy for multiple other adolescent health and behavioral risks, such as suicide risk, substance use, sexual risk behaviors, and poor mental health. Ongoing monitoring of ACEs among adolescents is critical to understand trends in the prevalence of ACEs, inequities in the number of ACEs, and effects of ACEs prevention efforts over time. Future research in this area might examine how individual ACEs uniquely contribute to health conditions and risk behaviors, including across demographic groups, and identify protective factors and positive childhood experiences that might buffer against

the negative effect of ACEs on adolescent health conditions and risk behaviors. In 2023, CDC's National Center for Injury Prevention and Control partnered with the Division of Adolescent and School Health to obtain national level estimates of ACEs. Ongoing research and surveillance are warranted to support data-driven, evidence-based implementation of primary prevention approaches to prevent ACEs and to mitigate their harms. CDC supports a robust portfolio across the public health model to better monitor, understand, prevent, and respond to ACEs so that all children and families can thrive (*1*).

Conclusion

ACEs are common in U.S. high school students and have significant associations with negative health conditions and risk behaviors. Prevalence of individual ACEs differ by demographic characteristics, with the highest prevalence of ACEs disproportionately affecting female, AI/AN, multiracial, and LGBQ+ students. Preventing ACEs has considerable potential public health impact in adolescence and beyond, with substantial population-attributable fractions (>50%) for all violence, substance use, sexual, mental health, and suicide-related behaviors. Timely, adolescent-reported data on ACEs is needed to tailor prevention strategies to specific cultural contexts and populations. CDC's Preventing Adverse Childhood Experiences Resource for Action provides evidence-based strategies and approaches to prevent ACEs and mitigate their consequences (*1*).

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Jonetta J. Mpofu reported being a board member of the American School Health Association. No other potential conflicts of interest were disclosed.

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Disparities in School Connectedness, Unstable Housing, Experiences of Violence, Mental Health, and Suicidal Thoughts and Behaviors Among Transgender and Cisgender High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Transgender high school students (those whose gender identity differs from their sex assigned at birth) experience disparate health outcomes and challenges in school, including violence and discrimination, compared with cisgender students (those whose gender identity aligns with their sex assigned at birth). Until recently, population-based data describing the experiences of transgender students and students questioning whether they are transgender (questioning) have been limited. In 2023, the national Youth Risk Behavior Survey assessed transgender identity, providing the first nationally representative data about transgender students. This report describes the demographic characteristics of transgender and questioning high school students and examines differences in the prevalence of experiences of violence, poor mental health, suicidal thoughts and behaviors, school connectedness, and unstable housing among transgender, questioning, and cisgender high school students nationwide. In 2023, 3.3% of U.S. high school students identified as transgender, and 2.2% identified as questioning. Transgender and questioning students experienced a higher prevalence of violence, poor mental health, suicidal thoughts and behaviors, and unstable housing, and a lower prevalence of school connectedness than their cisgender peers. Compared with 8.5% of cisgender male students, 25.3% of transgender students and 26.4% of questioning students skipped school because they felt unsafe. An estimated 40% of transgender and questioning students were bullied at school, and 69% of questioning students and 72% of transgender students experienced persistent feelings of sadness or hopelessness, a marker for experiencing depressive symptoms. Approximately 26% of transgender and questioning students attempted suicide in the past year compared with 5% of cisgender male and 11% of cisgender female students. Intervention opportunities for schools to create safer and more supportive environments for transgender and questioning students can help address these disparities. The findings of this report suggest that more effort is necessary to ensure that the health and well-being of youths who are socially marginalized is prioritized.

Introduction

Gender refers to the socially constructed norms and expectations imposed on persons according to their designation as male or female sex at birth. Gender identity refers to a person's sense of self and personal experience of gender. Transgender persons are those persons whose gender identity differs from their sex assigned at birth, whereas cisgender describes persons who identify with the gender aligned with their sex assigned at birth (https://www.who.int/health-topics/gender). Transgender students experience multiple health disparities compared with cisgender students (*1*). Gender identity development is a fundamental part of adolescence; transgender and questioning youth who do not conform to social expectations of gender might experience gender dysphoria, discrimination, or violence. Transgender and questioning students face unique challenges at school, including being unable to use bathrooms or play on sports teams matching their gender identity, being misgendered (i.e., addressed by the wrong name by teachers and peers), and otherwise being unable to express themselves in a way consistent with their gender identity (*2*). Negative experiences at school, including harassment and bullying, contribute to environments where transgender students do not feel safe and supported (*2*). Feelings of school connectedness (i.e., the belief held by students that adults and peers in the school care about them, their well-being, and their success) also might be diminished among transgender students. School connectedness

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has been linked to positive health outcomes into adulthood and is a protective factor for adolescents facing stress, adversity, or marginalization (*3*,*4*). Housing is a key social determinant of health that influences adolescent health outcomes, and CDC recognizes the importance of safe, healthy housing as part of the agency's broader health equity strategy (*5*).

Population-based data on the experiences of transgender and questioning students have been limited. In 2023, the national Youth Risk Behavior Survey (YRBS) assessed transgender identity in the United States for the first time. This report provides the first nationally representative estimates of transgender identity among U.S. high school students and examines disparities among experiences of school connectedness, housing instability, violence, mental health, and suicidal thoughts and behaviors comparing transgender, questioning, and cisgender students. Professionals in public health, education, and government, as well as persons and families seeking to support youths in their lives can use these data to understand the experiences and challenges related to health and well-being faced by transgender and questioning students nationwide and address the need to develop strategies that prevent disparate experiences and outcomes for these populations.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*6*). The prevalence estimates for transgender identity for the overall study population and by sex, race and ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Measures

YRBS measures and analytic coding are available (Table 1). A single item assessing transgender identity was developed by CDC survey methodologists and external researchers. In 2018, the item was cognitively tested with high school students and found to be understood as written.The question reads, "Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?" Students who responded, "Yes, I am transgender," were categorized as transgender, and students who responded, "I am not sure if I am transgender," were categorized as transgender or questioning. Students who responded, "No, I am not transgender," were assumed to be cisgender. Students who responded, "I do not know what this question is asking," and students who skipped the question were excluded from analyses. Demographic measures included sex (female or male), race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], or multiracial [selected >1 racial category]) (persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are categorized as non-Hispanic), grade (9, 10, 11, or 12), and sexual identity (heterosexual, gay or lesbian, bisexual, questioning [I am not sure about my sexual identity/questioning], or described in some other way [I describe my identity some other way]). Cisgender students were further disaggregated by sex. This question does not specify sex assigned at birth, and it is possible that transgender or questioning students might have responded to this question differently than cisgender students. For this reason, transgender and questioning students are not further disaggregated by sex for analysis of health behaviors and experiences. Sex is reported for transgender and questioning students for descriptive purposes (Table 2). Because small numbers of transgender and questioning students identified as AI/AN, Asian, or NH/OPI, data from these three racial groups were suppressed. The health behaviors and experiences examined in this report represent key indicators for adolescents, including an important protective factor for adolescent health and well-being (school connectedness), and a social determinant of health (housing).

Analysis

All prevalence estimates used Taylor series linearization. The prevalence of transgender, cisgender, and transgender questioning students were estimated for students overall and by sex, grade, race and ethnicity, and sexual identity. Differences in demographic characteristics by transgender

TABLE 1. Questions, response options, and analytic coding for select health risk behaviors among high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Experience of violence			
Missed school due to feeling unsafe	During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?	0 days, 1 day, 2 or 3 days, 4 or 5 days, or ≥6 days	Yes (1 day, 2 or 3 days, 4 or 5 days, or ≥6 days) versus no (0 days)
Threatened or injured with a weapon at school	During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?	0 times, 1 time, 2 or 3 times, 4 or 5 times, 6 or 7 times, 8 or 9 times, 10 or 11 times, or ≥12 times	Yes (1 time, 2 or 3 times, 4 or 5 times, 6 or 7 times, 8 or 9 times, 10 or 11 times, or ≥12 times) versus no (0 times)
Bullied at school	During the past 12 months, have you ever been bullied on school property?	Yes or no	Yes versus no
Electronically bullied	During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes or no	Yes versus no
Mental health			
Frequent mental distress during the past <30 days	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Never, rarely, sometimes, most of the time, or always	Yes (most of the time or always) versus no (never, rarely, or sometimes)
Experienced persistent feelings of sadness or hopelessness during the past 12 months	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Suicidal thought or behavior			
Seriously considered suicide during the past 12 months	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no
Made a suicide plan during the past 12 months	During the past 12 months, did you make a plan about how you would attempt suicide?	Yes or no	Yes versus no
Attempted suicide during the past 12 months	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes (1 time, 2 or 3 times, 4 or 5 times, or ≥6 times) versus no (0 times)
Had a suicide attempt treated by a doctor or nurse during the past 12 months	If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?	Yes, no, or I did not attempt suicide during the past 12 months	Yes versus no (no or I did not attempt suicide during the past 12 months)
School connectedness			
Felt close to others at school	Do you agree or disagree that you feel close to people at your school?	Strongly agree, agree, not sure, disagree, or strongly disagree	Yes (strongly agree or agree) versus no (strongly disagree, disagree, or not sure)
Housing			
Experienced unstable housing	During the past 30 days, where did you usually sleep?	In my parent's or guardian's home; in the home of a friend, family member, or other person because I had to leave my home or my parent or guardian cannot afford housing; in a shelter or emergency housing; in a motel or hotel; in a car, park, campground, or other public place; or I do not have a usual place to sleep or somewhere else	Yes (in the home of a friend, family member, or other person because I had to leave my home or my parent or guardian cannot afford housing; in a shelter or emergency housing; in a motel or hotel; in a car, park, campground, or other public place; or I do not have a usual place to sleep) versus no (in my parent's or guardian's home or somewhere else)

identity were assessed using pairwise *t*-tests. Presenting the prevalence estimate of each health behavior and experience for transgender and questioning students permitted description of the effects of adverse health challenges that they faced separately from cisgender students. Adjusted prevalence estimates of health behaviors and experiences stratified by cisgender male, cisgender female, transgender, and questioning students were calculated using logistic regression with predicted marginals, controlling for underlying differences by race and ethnicity and grade. Prevalence estimates with denominators <30 were considered statistically unreliable and therefore were suppressed (*6*). Differences in adjusted prevalence by transgender identity were assessed through pairwise *t*-test analysis. Differences in results were considered statistically significant at $p<0.05$. Analyses were conducted using SAS-callable SUDAAN (version 11.0.3; RTI International), accounting for complex survey design and weighting.

TABLE 2. Demographic characteristics stratified by transgender identity among high school students — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Gender identity†			*t*-test p value§		
	Cisgender (n = 16,986)¶	Transgender (n = 612)¶	Questioning (n = 428)¶			
	% (95% CI)**	% (95% CI)**	% (95% CI)**	Cisgender versus transgender	Cisgender versus questioning	Transgender versus questioning
Total	**94.5 (93.6–95.3)**	**3.3 (2.8–4.0)**	**2.2 (1.8–2.7)**			
Sex††						
Female	47.5 (45.2–49.8)	64.2 (57.2–70.5)	64.3 (57.9–70.5)	<0.0001	<0.0001	0.9693
Male	52.5 (50.2–54.8)	35.8 (29.5–42.8)	35.7 (29.7–42.1)	<0.0001	<0.0001	0.9693
Race or ethnicity§§						
American Indian or Alaska Native	0.3 (0.2–0.5)	——¶¶	——	——	——	——
Asian	4.3 (2.8–6.5)	——	——	——	——	——
Black or African American	13.8 (9.4–19.7)	5.4 (3.0–9.5)	11.8 (7.0–19.2)	0.0003	0.4008	0.0144
Native Hawaiian or other Pacific Islander	0.4 (0.1–1.0)	——	——	——	——	——
White	48.3 (41.3–55.3)	64.0 (52.7–73.9)	46.4 (35.7–57.6)	0.0022	0.7404	0.0015
Hispanic or Latino	26.8 (22.2–32.0)	21.5 (13.2–33.0)	27.7 (17.6–40.7)	0.2458	0.8648	0.2298
Multiracial	6.1 (4.4–8.5)	5.3 (2.6–10.5)	9.2 (5.1–16.1)	0.5039	0.2368	0.1898
Grade						
9	26.5 (24.3–28.8)	24.4 (19.3–30.4)	20.6 (16.4–25.6)	0.4702	0.0123	0.2403
10	25.8 (24.0–27.6)	24.3 (19.2–30.2)	29.0 (22.0–37.1)	0.5972	0.3779	0.2912
11	24.1 (22.1–26.3)	25.4 (19.9–32.0)	33.4 (24.8–43.4)	0.6422	0.0529	0.0729
12	23.6 (21.4–26.0)	25.9 (19.7–33.2)	17.0 (12.2–23.1)	0.5066	0.0133	0.0281
Sexual identity***						
Heterosexual	79.4 (77.3–81.3)	8.7 (4.9–15.0)	7.5 (3.4–15.8)	<0.0001	<0.0001	0.5719
Gay or lesbian	3.1 (2.7–3.7)	25.0 (19.4–31.5)	15.5 (10.1–23.1)	<0.0001	0.0003	0.0491
Bisexual	10.5 (9.4–11.8)	26.5 (20.7–33.3	33.4 (26.7–40.9)	<0.0001	<0.0001	0.1725
Questioning	4.1 (3.5–4.7)	7.0 (4.1–11.5)	20.4 (15.0–27.1)	0.0933	<0.0001	0.0004
Describe in some other way	2.9 (2.5–3.5)	32.8 (26.4–39.9)	23.2 (16.9–31.0)	<0.0001	<0.0001	0.0232

* N = 20,103 respondents. The total number of students answering each question varied. Data may be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Transgender identity was categorized as transgender for those who responded, "Yes, I am transgender," to the question, "Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?" Cisgender students are those who responded, "No, I am not transgender." Questioning students are those who responded, "I am not sure if I am transgender."

§ Pairwise *t*-test analysis for difference in student characteristics between gender identity groups (p<0.05).

¶ Unweighted sample size.

** Weighted prevalence estimate.

†† Sex is reported for transgender and questioning students for descriptive purposes. Because the sex question does not specify sex assigned at birth, there may be differences in interpretation among transgender students. For this reason, transgender students are not categorized by sex for other analyses.

§§ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶¶ Dashes indicate estimates and p values not available because denominator sample sizes are <30.

*** Students who responded, "I don't know what this question is asking" were excluded from analysis of sexual identity.

Results

Demographic Characteristics

Approximately 3.3% of high school students identified as transgender, and 2.2% reported questioning if they were transgender (Table 2). Most students (94.5%) did not identify as transgender or questioning. Differences in demographic characteristics were observed by transgender identity. Approximately half of cisgender students reported female sex (47.5%). Approximately two thirds of transgender or questioning students reported female sex (64.2% and 64.3%, respectively). Differences in race and ethnicity by transgender identity were observed. A lower proportion of transgender students identified as Black and higher proportion identified as White compared with cisgender or questioning students. In addition, for questioning students, differences in grade distribution were observed.

Differences in sexual identity were observed by transgender identity. Most cisgender students reported their sexual identity as heterosexual (79.4%), whereas only 8.7% of transgender students and 7.5% of questioning students identified as heterosexual. Transgender questioning students had a higher prevalence of questioning their sexual identity (20.4%) than both cisgender and transgender students (4.1% and 7.0%, respectively). The prevalence of students who described their sexual identity in some other way was greatest among transgender students (32.8%), followed by transgender questioning students (23.2%), with only 2.9% of cisgender students identifying as such.

Health Behaviors and Experiences

Unadjusted prevalence estimates reflect higher prevalence of adverse health behaviors and experiences for transgender and questioning students (Supplementary Table, https://stacks.cdc.gov/view/cdc/159811). Because of the differences in race and ethnicity and grade when comparing transgender, questioning, and cisgender students, adjusted prevalence estimates are presented (Table 3). Transgender and questioning students had the highest prevalence of experiencing violence, poor mental health, suicidal thoughts and behaviors, and unstable housing, and the lowest prevalence of school connectedness compared with cisgender students (Figure). Approximately one fourth of transgender and questioning students missed school because of feeling unsafe in the past 30 days (25.3% and 26.4%, respectively) compared with 8.5% of cisgender male students and 14.9% of cisgender female students. Being bullied at school in the past 12 months was the most prevalent experience of violence for all four gender identity categories, but a higher prevalence of bullying was reported by transgender (40.1%) and questioning (39.9%) students than cisgender female (20.3%) and cisgender male students (14.8%).

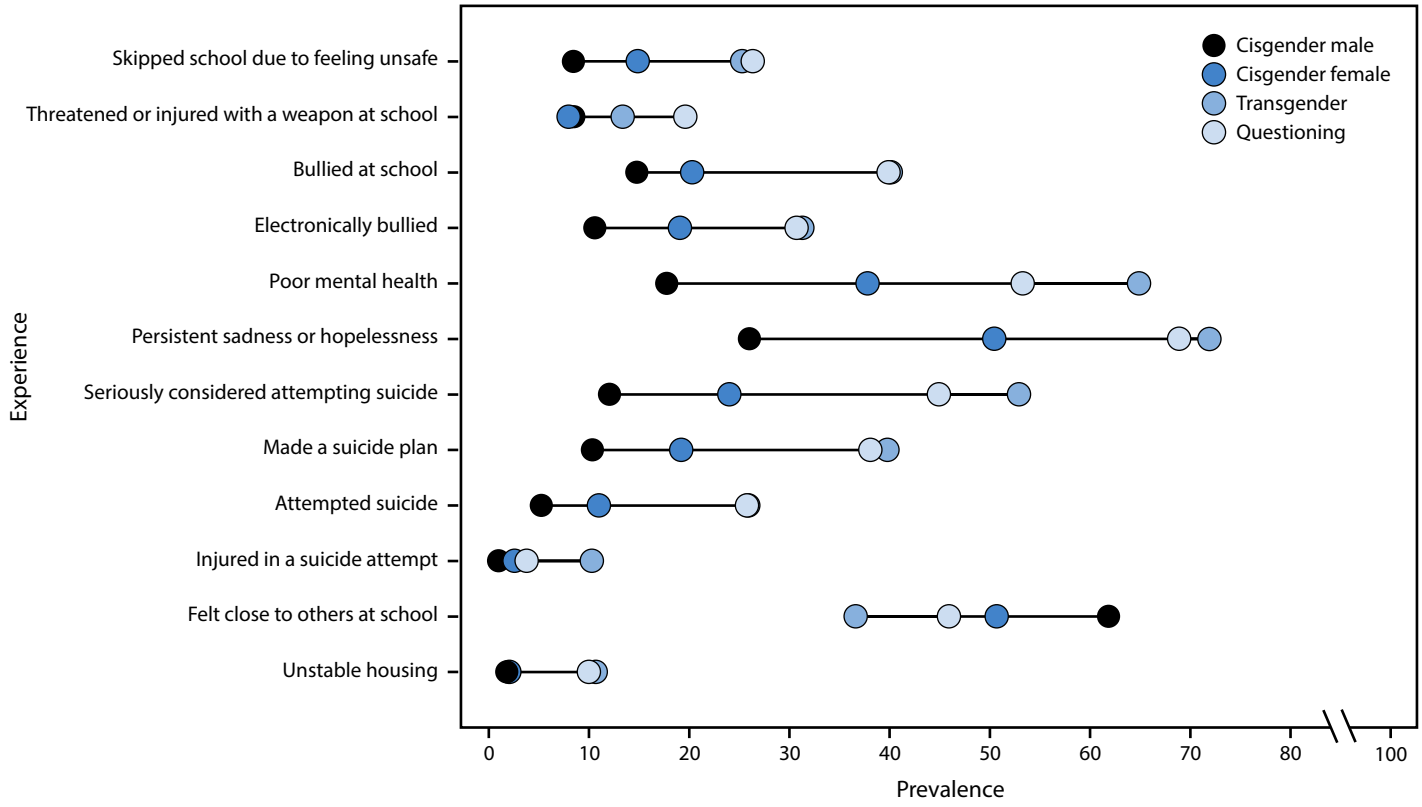
Similar differences in mental health and suicidal thoughts and behaviors were found for transgender and questioning students. Among transgender students, 64.9% reported poor mental health in the past 30 days and 71.9% reported persistent sadness or hopelessness in the past 12 months. Questioning students had a similarly high prevalence of these outcomes (53.3% and 68.9%, respectively). Cisgender females had the next highest prevalence of poor mental health (37.8%) and persistent feelings of sadness or hopelessness (50.5%), with cisgender males having the lowest prevalence of both outcomes (17.8% and 26.0%, respectively). Approximately half of transgender students (52.9%) and 44.9% of questioning students seriously considered attempting suicide in the past year, compared with 24.0% of cisgender females and 12.1% of cisgender males. Approximately one fourth of transgender and questioning students attempted suicide in the past year

TABLE 3. Prevalence estimates of experiences of violence, poor mental health, suicidal thoughts and behaviors, school connectedness, and unstable housing by gender identity among high school students — Youth Risk Behavior Survey, United States, 2023*

	Gender identity†			
	Cisgender male (n = 8,643)§	Cisgender female (n = 8,284)§	Transgender (n = 612)§	Questioning (n = 428)§
Health behavior and experience	% (95% CI)¶	% (95% CI)¶	% (95% CI)¶	% (95% CI)¶
Experience of violence				
Skipped school due to feeling unsafe there during the past 30 days	8.5 (6.5–10.9)	14.9 (12.0–18.3)**	25.3 (18.0–34.2)**,††	26.4 (19.3–35.0)**,††
Threatened or injured with a weapon at school during the past 12 months	8.5 (7.4–9.8)	8.0 (6.7–9.5)	13.4 (9.1–19.3)††	19.6 (13.6–27.3)**,††
Bullied at school during the past 12 months	14.8 (13.6–16.1)	20.3 (18.1–22.8)**	40.1 (32.7–48.0)**,††	39.9 (32.4–47.9)**,††
Electronically bullied during the past 12 months	10.6 (9.5–11.8)	19.1 (17.3–21.0)**	31.3 (25.1–38.2)**,††	30.7 (25.4–36.5)**,††
Mental health				
Poor mental health during the past 30 days	17.8 (16.3–19.4)	37.8 (35.6–40.2)**	64.9 (56.6–72.4)**,††,§§	53.3 (45.2–61.2)**,††
Persistent feelings of sadness or hopelessness during the past 12 months	26.0 (24.5–27.6)	50.5 (48.0–52.9)**	71.9 (64.0–78.6)**,††	68.9 (62.4–74.7)**,††
Suicidal thoughts and behavior				
Seriously considered attempting suicide during the past 12 months	12.1 (10.7–13.5)	24.0 (22.1–26.0)**	52.9 (46.0–59.7)**,††	44.9 (39.4–50.5)**,††
Made a suicide plan during the past 12 months	10.4 (9.4–11.4)	19.2 (17.4–21.2)**	39.8 (34.7–45.2)**,††	38.1 (32.0–44.6)**,††
Attempted suicide during the past 12 months	5.3 (4.3–6.4)	11.0 (9.8–12.3)**	25.9 (20.9–31.7)**,††	25.8 (19.6–33.1)**,††
Had a suicide attempt treated by a doctor or nurse during the past 12 months	1.0 (0.6–1.5)	2.6 (2.1–3.1)**	10.3 (6.4–16.4)**,††	3.7 (1.5–9.3)††
School connectedness				
Felt close to others at school	61.9 (58.9–64.7)	50.7 (47.9–53.5)**	36.6 (29.4–44.4)**,††,§§	45.9 (38.7–53.3)**
Housing				
Unstable housing during the past 30 days	2.1 (1.6–2.7)	1.8 (1.2–2.7)	10.7 (5.1–21.2)**,††	10.0 (3.1–27.4)

* N = 20,103 respondents. Numbers might not sum to totals because of missing data.
† Transgender identity was categorized as transgender for those who responded, "Yes, I am transgender" to "Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?" Questioning students are those who responded, "I am not sure if I am transgender." Cisgender students are those who responded, "No, I am not transgender." Because the sex question does not specify sex assigned at birth, there might be differences in interpretation among transgender students. For this reason, only cisgender students are further disaggregated by sex.
§ Unweighted sample size.
¶ Weighted, model-adjusted prevalence estimate. Logistic regression models adjusted for race and ethnicity and grade with specifications for predicted marginal proportions to produce adjusted prevalence estimates for each health behavior and experience.
** Significantly different from cisgender male students as determined by pairwise *t*-test analysis ($p<0.05$).
†† Significantly different from cisgender female students as determined by pairwise *t*-test analysis ($p<0.05$).
§§ Significantly different from questioning students as determined by pairwise *t*-test analysis ($p<0.05$).

FIGURE. Adjusted prevalence estimates* of experiences of violence, poor mental health, suicidal thoughts and behaviors, school connectedness, and unstable housing by transgender identity among high school students — Youth Risk Behavior Survey, United States, 2023



* Logistic regression models adjusted for race and ethnicity and grade with specifications for predicted marginal proportions to produce adjusted prevalence estimates for each health behavior and experience.

(25.9% and 25.8%, respectively) compared with 11.0% of cisgender females and 5.3% of cisgender males.

Transgender students reported the lowest prevalence of feeling close to others at school (36.6%), followed by questioning (45.9%) and cisgender female students (50.7%), with cisgender male students reporting the highest prevalence (61.9%). Transgender students had a higher prevalence of experiencing unstable housing in the past 30 days (10.7%) than questioning (10.0%), cisgender male (2.1%), and cisgender female students (1.8%).

Discussion

This study presents the first nationally representative prevalence estimates of transgender identity and questioning transgender identity among U.S. high school students, building on previous research among states and local urban school districts that have included the transgender identity item in their YRBSs since 2017 (*1*). Analysis of 18 states' 2021 YRBS data found similar prevalence of transgender identity and similar distributions across demographic characteristics of transgender and questioning students (*7*).

This study found that transgender and questioning students face a higher prevalence of experiencing violence, poor mental health, suicidal thoughts and behaviors, and unstable housing and a lower prevalence of school connectedness compared with their cisgender peers. Approximately 40% of transgender and questioning students were bullied at school. Approximately 26% of transgender and questioning students attempted suicide in the past year, compared with approximately 5% of cisgender males. The prevalence of unstable housing was highest among transgender students (10.7%) and lowest among cisgender females (1.8%). The disparities identified in this study are consistent with those from previous studies using state YRBS, clinical, and convenience samples (*1*,*8*). Previous research using 2017 and 2019 state YRBS data demonstrated that the prevalence of unstable housing was more than seven times higher among transgender and questioning students combined, who were also three times more likely to be living "on the streets" (i.e., in a car, park, campground, or other public place) when experiencing unstable housing, compared with cisgender students (*9*).

Minority stress theory and the gender minority stress framework (*10*) can be applied to understand the factors that perpetuate these disparities: Transgender and questioning persons experience stigma, discrimination, and social marginalization related to their gender as a result of institutionalized social norms that privilege cisgender persons. The accumulation of stressors, including internalization of stigmatized attitudes, expectations of rejection, and experiences of discrimination and violence, can increase the likelihood that transgender and questioning persons experience poor mental health and lead to disparities in health and well-being. Transgender and questioning students might face stressors in their family life (e.g., adverse childhood experiences, parental rejection, and misgendering) and school life (e.g., bullying, violence, misgendering by peers or teachers, and being denied access to activities aligned with their gender identity) that might increase their risk for poor mental health (*8*). Furthermore, transgender students of color might face additional marginalization related to their race or ethnicity. According to the GLSEN 2021 National School Climate Survey, approximately 80% of lesbian, gay, bisexual, transgender, and queer/questioning (LGBTQ+) students (K–12) experienced verbal, physical, or sexual harassment or assault at school, and approximately half of LGBTQ+ students of color experienced victimization related to race and ethnicity (*11*).

The structural and interpersonal discrimination, including family rejection, faced by transgender students puts this population at increased risk for experiencing unstable housing (*9*). Transgender students might experience discrimination, harassment, and assault among foster, shelter, and other social service providers that make this population less likely to be sheltered when experiencing unstable housing, compounding their vulnerability to experiences of violence, poor mental health, and suicidal thoughts and behaviors (*9*).

The findings in the report demonstrate that transgender and questioning students experience more violence, less school connectedness, more unstable housing, poorer mental health, and more suicidal thoughts and behaviors than their cisgender peers, underscoring the need for interventions to create safe and supportive environments for transgender and questioning students. Having supportive families and peers, feeling connected to family and school, having affirmed name and pronouns used consistently by others, and having a sense of pride of identity are protective factors for transgender students that buffer the effects of minority stressors and promote better mental health (*8*).

Intervention Opportunities

Schools are in a unique position to create safe and supportive environments, free from violence and bullying, for all students, including transgender and questioning students. Violence, poor mental health, and suicide are not caused by any single factor, and prevention will not be achieved by any single strategy. However, strategies that create safe and supportive environments inclusive of transgender students and promote school connectedness can improve the health and well-being of transgender students across a range of outcomes. Evidence supports the association of CDC's What Works in Schools (WWIS) approach (https://www.cdc.gov/healthyyouth/whatworks/what-works-overview.htm) with reductions in experiences of violence, poor mental health, and suicidal thoughts and behaviors among high school students (*12*). WWIS supports districts and schools to implement quality and inclusive health education, connect students to health services, and foster safe and supportive school environments. In particular, school connectedness and activities to promote safe and supportive environments are associated with decreased odds of experiencing violence, poor mental health, and suicidal thoughts and behaviors among high school students (*13*). Activities that are inclusive of LGBTQ+ students are associated with decreases in the odds of these experiences among all students regardless of sexual identity (*14*). Inclusive activities might involve implementing genders and sexualities alliances (student-led clubs offering a means for students with LGBTQ+ identities and allies to gather and provide support), providing professional development to educators and school staff members on supporting students with LGBTQ+ identities, providing mental health and other health service referrals that are inclusive of students with LGTBQ+ identities, and implementing policies that are inclusive of students with LGBTQ+ identities. To date, the WWIS approach has not been evaluated specifically among transgender and questioning students. Further research is necessary; however, the possibility of school supports as health enhancing for transgender and questioning students is promising.

CDC's Dating Matters (https://www.cdc.gov/intimate-partner-violence/php/datingmatters/index.html) is an evidence-based teen dating violence prevention model that educates adolescents on healthy relationships of certain types, including relationships with family and friends, and is effective for reducing risk for both experiencing and perpetrating violence and engaging in substance use. Dating Matters has been adapted to create A Guide to Healthy, Safe Relationships for LGBTQ+ Youth (https://vetoviolence.cdc.gov/apps/dating-matters-toolkit/static/media/Dating_Matters_LGTBQ%20Guide_Youth_v5a_508.fde67eab.pdf), a tailored resource

that provides information on healthy relationships specific to the unique needs and experiences of students with LGBTQ+ identities. CDC's Suicide Prevention Resources for Action (https://www.cdc.gov/suicide/resources/prevention.html) identifies strategies for a comprehensive approach to suicide prevention that addresses the multiple factors associated with suicide risk. The implementation of school-based strategies and community-based supports can serve as the foundation for effective youth suicide prevention. Schools can create safe and supportive environments and promote connectedness by teaching coping and problem solving, providing gatekeeper training to peers, teachers, and other adults at school, and implementing mental health support (the term "gatekeeper" refers to persons trained to identify people at risk for suicide and to respond effectively by facilitating referrals to treatment and support services https://www.cdc.gov/suicide/pdf/preventionresource.pdf). CDC's Comprehensive Suicide Prevention Program (https://www.cdc.gov/suicide/programs/csp.html) funds 24 programs to implement and evaluate a comprehensive public health approach to suicide prevention, with a special focus on populations disproportionately affected by suicide, including transgender and questioning students.

The McKinney-Vento Homeless Assistance Act[†] (MVA) is a Federal law that authorizes services that allow students experiencing unstable housing to enroll, attend, and achieve success in school. Certain MVA programs provide training and support for referrals to school- and community-based programs for family counseling, adolescent health and mental health care, and LGBTQ+ programs supported by student-led groups including genders and sexualities alliances (*15*). Schools can play a pivotal role in supporting transgender and questioning students experiencing unstable housing by implementing and connecting students with such MVA-funded programs tailored to the needs of this population.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*6*). The findings in this report are subject to at least four additional limitations. First, because of the low number of AI/AN, Asian, and NH/OPI students identifying as transgender, data among these groups were suppressed; however, continued collection of transgender identity in the national YRBS will allow for aggregating data across cycles to achieve larger sample sizes. Second, the survey question assessing sex on the YRBS does not specify sex assigned at birth. Transgender students might not respond to the sex survey question consistently as their sex assigned at birth or gender identity and therefore this analysis could not further disaggregate transgender students. Third, sex is used to calculate sample weights used in analyses, which might therefore be inaccurate for transgender students. Population-based surveys such as YRBS are needed to establish the prevalence of transgender and questioning adolescents in the United States so that future surveys might be able to incorporate transgender identity into survey weights. Finally, students who responded, "No, I am not transgender," to the transgender identity item were assumed to be cisgender, but students with this response also might have a gender identity other than cisgender that might not be recorded by transgender identity (e.g., nonbinary, genderfluid, and agender).

Future Directions

More research is needed in describing experiences among transgender and questioning students by race and ethnicity and by more specific measures of gender identity, such as differences for nonbinary students, transgender girls, and transgender boys. Further research is needed on health behaviors and experiences not analyzed in the present study, including adverse childhood experiences and social media usage, which might relate to adolescent mental health. In addition, continued research on the school-based strategies that can best support transgender students is needed to tailor existing strategies, develop clear guidance for schools and families, and identify innovative strategies that achieve equity for transgender and questioning students.

Conclusion

These results provide insight into the challenges faced by transgender and questioning students and provide much needed context for ongoing discussions about how best to support and protect transgender and questioning students. These are the first nationally representative data on transgender and questioning students. Their school environments are neither as safe nor as supportive as they are for their cisgender peers. That transgender and questioning students are more likely to experience poor mental health and suicidal thoughts and behaviors than their cisgender peers is concerning. Tools exist to improve the safety and supportiveness of schools, and research demonstrates that when schools make steps to implement inclusive policies and practices, the mental health of all students improves. More effort is necessary to ensure that the health and well-being of students who are socially marginalized is prioritized.

[†] 42 USC chapter 119, subchapter VI, part B: Education for homeless children and youths. https://uscode.house.gov/view.xhtml?path=/prelim%40title42/chapter119/subchapter6/partB&edition=prelim

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Conflict of Interest

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Asking for Verbal Sexual Consent and Experiences of Sexual Violence and Sexual Behaviors Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Adolescents' sexual consent behaviors are critical for developing healthy sexual relationships and preventing experiences of sexual violence. This report uses 2023 Youth Risk Behavior Survey data to describe prevalence of asking for sexual consent verbally at last sexual contact among U.S. high school students. Differences in prevalence of asking for sexual consent verbally by sex, age, race and ethnicity, sexual identity, sex of sexual contacts, and gender identity were examined. Differences in asking for sexual consent verbally also were examined by experiences of sexual violence and sexual behaviors. Sex-stratified logistic regression analyses were performed to determine the association between asking for sexual consent verbally with experiences of sexual violence and sexual behaviors. In addition, data were analyzed using adjusted logistic regression models controlling for age, race and ethnicity, and sexual identity. Among high school students who reported ever having sexual contact, 79.8% reported asking for sexual consent verbally at last sexual contact. A lower percentage of female students (74.5%) reported asking for sexual consent verbally than male students (84.6%). In adjusted sex-stratified analyses, female students who asked for sexual consent verbally had higher prevalence of ever having had sexual intercourse. Male students who asked for sexual consent verbally had higher prevalence of ever having had sexual intercourse and being currently sexually active. Female and male students who asked for sexual consent verbally had higher prevalence of having first sexual intercourse before age 13 and using condoms. In addition, female students who asked for sexual consent verbally during last sexual intercourse had lower prevalence of using alcohol or drugs at last sexual intercourse. Public health researchers and practitioners, health care providers, schools, and youth-serving organizations can use these findings to better understand high school students' verbal sexual consent, improve complex measurement of consent-seeking behaviors, and guide multicomponent sexual health and violence prevention efforts across various settings.

Introduction

Sexual consent is a necessary foundation for all sexual activity and has implications for improving sexual health, including reducing sexual violence. Understanding sexual consent communication during adolescence is critical because many adolescents experiment with sexual behavior. In 2021, a total of 30% of U.S high school students reported ever having had sexual intercourse, with nearly one fourth having sex in the past 3 months (https://www.cdc.gov/healthyyouth/data/yrbs/yrbs_data_summary_and_trends.htm). Research examining consent behaviors among adolescents remains limited, but is essential, particularly because of associations between lack of consent and sexual violence.

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To date, sexual consent research has primarily been conducted among college student populations (*1*). Evidence suggests college students hold positive attitudes toward affirmative consent (i.e., explicitly communicated, verbally or nonverbally) (*2*), despite more commonly using implicit and nonverbal cues to communicate consent (*1*,*2*). Differences by gender illustrate that, although implicit or nonverbal cues are more commonly used overall, college men report using verbal and explicit cues more frequently than college women, who frequently report using no response signals (i.e., letting sexual behaviors happen without resisting) to indicate consent (*3*). Notably, college students often are able to accurately interpret their partners' cues; however, implicit and nonverbal cues are ambiguous and can be difficult to decipher, especially if persons have consumed alcohol or drugs before sexual activity (*3*). Significant gaps in knowledge about sexual consent behaviors remain, especially among adolescents (aged ≤18 years). The limited research

available suggests adolescents also endorse positive attitudes toward explicit and affirmative sexual consent (*4*,*5*). However, research that examines how adolescents communicate consent is lacking, including whether differences exist in consent communication by sex, particularly whether adolescents use explicit, verbal consent.

To begin addressing these knowledge gaps, the 2023 national Youth Risk Behavior Survey (YRBS) included a new questionnaire item measuring whether U.S. high school students asked for sexual consent verbally at last sexual contact. This report presents the first national estimates for asking for sexual consent, verbally, among high school students. The report also examines whether the prevalence of asking for sexual consent verbally differed by experiences of sexual violence and sexual behaviors. The findings in this report can be used by public health researchers and practitioners, health care providers, schools, and youth-serving organizations to better understand high school students' verbal sexual consent, improve complex measurement of consent-seeking behaviors, and guide multicomponent sexual health and violence prevention efforts across various settings.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*6*). The prevalence estimates for asking for verbal sexual consent, experiences of sexual violence, and sexual behaviors for the study population overall and stratified by demographic characteristics are available at https://nccd.cdc.gov/Youthonline/App/Default.aspx. The full YRBS questionnaire, datasets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional reviews boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Measures

YRBS questions, response options, and analytic coding are presented (Table 1). The primary outcome of interest was asking for sexual consent verbally at last sexual contact, determined by asking, "The last time you had sexual contact, did you ask for consent verbally?" (yes, no, or I have never had sexual contact). Because consent seeking is important in the context of adolescent sexual behaviors and violence, three experiences of sexual violence and eight sexual behaviors were examined. Demographic characteristics examined were sex (female or male); age (≤14, 15, 16, 17, or ≥18 years); race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], or multiracial [selected >1 racial category]) (persons of Hispanic origin might be of any race but are categorized as Hispanic; all other racial groups are non-Hispanic); sexual identity (heterosexual, gay or lesbian, bisexual, questioning [I am not sure about my sexual identity/questioning], or describe identity in some other way [I describe my identity some other way]); sex of sexual contacts (opposite sex only, same sex only, or both sexes); and gender identity (cisgender, transgender, or questioning). The number of students who identified as NH/OPI was too small to include in analyses. Students who reported, "No, I am not transgender" to the gender identity variable were assumed to be cisgender.

Analysis

The analytic sample was restricted to those who ever had sexual contact (n = 5,492). For analyses that involved the variable of experienced sexual dating violence, the sample was further restricted to those who reported going on a date or going out with anyone in the past 12 months. For analyses that involved the variables of first sexual intercourse before age 13 years, alcohol or drug use during last sexual intercourse, and condom use during last sexual intercourse, the sample was further restricted to those who ever had sexual intercourse. For analyses examining primary contraceptive method used to prevent pregnancy during last sexual intercourse, the sample was further restricted to those who ever had sexual intercourse with an opposite-sex partner.

All prevalence estimates and measures of association used Taylor series linearization. Weighted prevalences and 95% CIs of asking for sexual consent verbally at last sexual contact by demographic characteristics are presented for the total study population and stratified by sex. Differences in prevalence of

TABLE 1. Questions, response options, and analytic coding for asking for sexual consent verbally, experiences of sexual violence, and sexual behaviors — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Asking for sexual consent verbally	Consent is an agreement to do something or permission for something to happen. It can involve asking for consent, receiving consent, or giving consent. The last time you had sexual contact, did you ask for consent verbally?	Yes, no, or I have never had sexual contact	Yes versus no
Experience of sexual violence			
Experienced sexual violence by anyone during the past 12 months	During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)	0 times, 1 time, 2–3 times, 4–5 times, or ≥6 times	Yes (1 time, 2–3 times, 4–5 times, or ≥6 times) versus no (0 times)
Experienced sexual dating violence during the past 12 months	During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)	I did not date or go out with anyone during the past 12 months, 0 times, 1 time, 2–3 times, 4–5 times, or ≥6 times	Yes (1 time, 2–3 times, 4–5 times, or ≥6 times) versus no (0 times)
Ever experienced forced sexual intercourse	Have you ever been physically forced to have sexual intercourse when you did not want to?	Yes or no	Yes versus no
Sexual behavior			
Ever had sexual intercourse	Have you ever had sexual intercourse?	I have never had sexual intercourse, yes, or no	Yes (yes) versus no (no or I have never had sexual intercourse)
First sexual intercourse before age 13 years	How old were you when you had sexual intercourse for the first time?	I have never had sexual intercourse, aged ≤11 years, 12 years, 13 years, 14 years, 15 years, 16 years, or ≥17 years	Yes (aged ≤11 years or 12 years) versus no (aged 13 years, 14 years, 15 years, 16 years, or ≥17 years)
Currently sexually active	During the past 3 months, with how many people did you have sexual intercourse?	I have never had sexual intercourse; I have had sexual intercourse, but not during the past 3 months; 1 person; 2 persons; 3 persons; 4 persons; 5 persons; or ≥6 persons	Yes (1 person, 2 persons, 3 persons, 4 persons, 5 persons, or ≥6 persons) versus no (I have never had sexual intercourse or I have had sexual intercourse, but not during the past 3 months)
Alcohol or drug use during last sexual intercourse	Did you drink alcohol or use drugs before you had sexual intercourse the last time?	I have never had sexual intercourse, yes, or no	Yes versus no
Condom use during last sexual intercourse	The last time you had sexual intercourse, did you or your partner use a condom?	I have never had sexual intercourse, yes, or no	Yes versus no
Highly or moderately effective hormonal contraceptive method use during last sexual intercourse	The last time you had sexual intercourse with an opposite-sex partner, what one method did you or your partner use to prevent pregnancy?	I have never had sexual intercourse with an opposite-sex partner; no method was used to prevent pregnancy; birth control pills (not including emergency contraception such as Plan B or the morning after pill); condoms; an IUD (such as Mirena or ParaGard) or implant (such as Implanon or Nexplanon); a shot (such as Depo-Provera), patch (such as Ortho Evra), or birth control ring (such as NuvaRing); withdrawal or some other method; or not sure	Yes (birth control pills; an IUD or implant; or a shot, patch, or birth control ring) versus no (no method was used to prevent pregnancy, condom, withdrawal or some other method, or not sure)
Condoms as primary contraceptive method during last sexual intercourse	The last time you had sexual intercourse with an opposite-sex partner, what one method did you or your partner use to prevent pregnancy?	I have never had sexual intercourse with an opposite-sex partner; no method was used to prevent pregnancy; birth control pills (not including emergency contraception such as Plan B or the morning after pill); condoms; an IUD (such as Mirena or Paragard) or implant (such as Implanon or Nexplanon); a shot (such as Depo-Provera), patch (such as Ortho Evra), or birth control ring (such as NuvaRing); withdrawal or some other method; or not sure	Yes (condoms) versus no (birth control pills; an IUD or implant; a shot, patch, or birth control ring; no method was used to prevent pregnancy; withdrawal or some other method; or not sure)
Receipt of STI testing during the past 12 months	During the past 12 months, have you been tested for a sexually transmitted disease other than HIV, such as chlamydia or gonorrhea?	Yes, no, or not sure	Yes versus no

Abbreviations: IUD = intrauterine device; STI = sexually transmitted infection.

asking for sexual consent verbally by age, race and ethnicity, sexual identity, and sex of sexual contacts were examined using pairwise *t*-tests among female and male students. Overall, among students in the analytic sample, prevalence of asking for sexual consent verbally was examined by gender identity. Sex-stratified prevalences and 95% CIs of asking for sexual consent verbally by each experience of sexual violence and behavior are presented. Pairwise *t*-test analysis was used to examine whether the sex-stratified prevalence of asking for sexual consent verbally at last sexual contact differed by each experience of sexual violence and sexual behavior. Differences assessed by *t*-tests were considered statistically significant for p values <0.05. Sex-stratified logistic regression analyses were performed to determine the association between asking for sexual consent verbally with experiences of sexual violence and sexual behaviors. Adjusted prevalence ratios were calculated using logistic regression with predicted marginals. Adjusted models included age, race and ethnicity, and sexual identity. Model-adjusted–risk differences were assessed through pairwise comparisons of students who asked for verbal sexual consent versus those who did not. Statistical significance was determined by whether the 95% CI of the adjusted prevalence ratio did not include 1.0 or if the model-adjusted risk difference p value was <0.05. Prevalence estimates with denominators <30 were considered statistically unreliable and therefore suppressed (*7*). Analyses were conducted using SAS-callable SUDAAN (version 11.0.3; RTI International) to account for the complex sampling design and weighting.

Results

Among U.S. high school students who had sexual contact (n = 5,492), 79.8% reported asking for sexual consent verbally at last sexual contact (Table 2). Female students were less likely to ask for sexual consent verbally than male students (74.5% versus 84.6%). Among females, students aged ≥18 years were less likely (66.4%) to ask for sexual consent verbally than students aged 17 years (78.0%) and 16 years (76.5%). Among females, Asian students were more likely to ask for sexual consent verbally (92.3%) than their Hispanic (75.1%), multiracial (75.0%), White (74.0%), Black (73.2%), and AI/AN (72.1%) peers. Female students who had same-sex–only sexual contacts were more likely to ask for sexual consent verbally (85.9%) than female students who reported opposite-sex–only contacts (73.4%) or both sexes (76.0%). Among males, Black students were less likely to ask for sexual consent verbally (76.0%) than Hispanic (87.6%) and White students (85.3%). Male students identifying as bisexual had a higher prevalence of asking for sexual consent verbally (94.2%) than male students identifying as heterosexual (85.2%) or questioning (65.8%). Male students identifying as gay also were more likely than those questioning their sexual identity to ask for sexual consent verbally (86.6% versus 65.8%). Male students who reported sexual contact with both sexes were more likely to ask for sexual consent verbally than male students who had same-sex–only contacts (89.1% versus 77.8%).

No differences were found in the sex-stratified prevalence of asking for sexual consent verbally by any experiences of sexual violence (Table 3). Students who ever had sexual intercourse versus not (female students: 76.3% and 70.6%, respectively; male students: 86.8% and 80.2%, respectively) or were currently sexually active versus not (female students: 77.2% and 72.1%, respectively; male students: 87.2% and 82.8%, respectively) had a higher prevalence of having asked for sexual consent verbally at last sexual contact (Table 3). Male students who reported first sexual intercourse before age 13 years reported lower prevalence of asking for sexual consent verbally than those who had their first sexual intercourse after age 13 years (74.7% versus 85.4%). Students who used a condom during last sexual intercourse versus not had a higher prevalence of having asked for sexual consent verbally at last sexual contact (female students: 80.5% and 72.3%, respectively; male students: 90.4% and 80.9%, respectively) (Table 3). For male students, those who reported using condoms as their or their partner's primary contraceptive method during last sexual intercourse had higher prevalence of asking for sexual consent verbally than those who did not (90.4% versus 83.2%) (Table 3).

In analyses adjusted for age, race and ethnicity, and sexual identity, female students who asked for sexual consent verbally had higher prevalence of ever having had sexual intercourse, higher prevalence of using condoms, lower prevalence of first sexual intercourse before age 13, and lower prevalence of using alcohol or drugs during last sexual intercourse (Table 4). Male students who asked for sexual consent verbally had higher prevalence of ever having had sexual intercourse, and being currently sexually active, and lower prevalence of first sexual intercourse before age 13. Male students who asked for sexual consent verbally had higher prevalence of using a condom during last sexual intercourse and using a condom as their or their partner's primary contraceptive method to prevent pregnancy during last sexual intercourse with an opposite-sex partner than those who did not ask for sexual consent (Table 4).

TABLE 2. Prevalence of asking for sexual consent verbally at last sexual contact among high school students who ever had sexual contact, by demographic characteristics and sex — Youth Risk Behavior Survey, United States, 2023*

	Asked for sexual consent verbally at last sexual contact†		
	Total§ % (95% CI)¶	Female % (95% CI)¶	Male % (95% CI)¶
Characteristic	**79.8 (77.8–81.7)**	**74.5 (71.6–77.1)****	**84.6 (82.0–86.9)**
Age, yrs			
≤14	**78.6 (73.1–83.2)**	70.6 (61.4–78.4)	86.0 (78.0–91.4)
15	**80.8 (77.2–84.0)**	74.3 (67.8–80.0)	86.5 (82.4–89.9)
16	**81.8 (79.3–84.1)**	76.5 (72.2–80.4)††	86.0 (82.2–89.1)
17	**80.5 (77.7–83.0)**	78.0 (73.8–81.7)§§	82.9 (78.8–86.4)
≥18	**74.9 (70.0–79.3)**	66.4 (57.5–74.3)	82.3 (77.5–86.2)
Race and ethnicity¶¶			
American Indian or Alaska Native	**78.2 (67.6–86.0)**	72.1 (53.3–85.4)***	87.3 (73.1–94.5)
Asian	**89.9 (82.8–94.3)**	92.3 (83.1–96.7)†††,§§§,¶¶¶,****	88.1 (73.9–95.1)
Black or African American	**74.6 (66.9–81.0)**	73.2 (63.7–80.9)	76.0 (67.4–82.8)††††,§§§§
White	**79.9 (77.2–82.4)**	74.0 (69.4–78.0)	85.3 (82.1–88.0)
Hispanic or Latino	**81.5 (78.6–84.1)**	75.1 (71.5–78.4)	87.6 (82.8–91.2)
Multiracial	**81.7 (76.2–86.2)**	75.0 (67.0–81.6)	86.3 (77.9–91.9)
Sexual identity			
Heterosexual (straight)	**81.1 (78.6–83.4)**	74.4 (69.9–78.5)	85.2 (82.6–87.4)¶¶¶¶
Lesbian or gay	**80.9 (72.6–87.2)**	76.9 (65.6–85.3)	86.6 (75.6–93.1)*****
Bisexual	**80.0 (75.3–84.0)**	76.7 (72.0–80.8)	94.2 (85.8–97.8)†††††
Identify some other way§§§§§	**72.8 (60.9–82.2)**	71.3 (58.2–81.7)	77.6 (54.2–91.0)
Questioning	**73.1 (63.5–81.0)**	75.0 (64.6–83.1)	65.8 (44.9–82.0)
Sex of sexual contacts			
Opposite sex only	**80.1 (77.7–82.3)**	73.4 (69.5–77.0)¶¶¶¶¶	84.9 (82.1–87.4)
Same sex only	**82.8 (75.6–88.3)**	85.9 (76.8–91.8)******	77.8 (68.0–85.3)††††††
Both sexes	**78.5 (72.9–83.2)**	76.0 (69.7–81.4)	89.1 (78.7–94.7)
Gender identity			
Cisgender	**80.2 (78.3–82.0)**	—	—
Transgender	**76.6 (61.9–86.8)**	—	—
Questioning	**76.8 (61.7–87.2)**	—	—

Abbreviation: YRBS = Youth Risk Behavior Survey.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Prevalence of asking for sexual consent was among those who ever had sexual contact.

§ The total (N = 5,492 [2,662 females and 2,806 males]) is unweighted.

¶ Weighted. Due to missing data, the total for each group will not add to the total reported.

** Male students significantly differed from female students on the overall prevalence of asking for sexual consent verbally based on *t*-test analysis with Taylor series linearization (p<0.05).

†† Among female students, those aged 16 years significantly differed from students aged ≥18 years based on *t*-test analysis with Taylor series linearization (p<0.05).

§§ Among female students, those aged 17 years significantly differed from students aged ≥18 years based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic. Due to a small sample size, Native Hawaiian or Pacific Islander estimates were suppressed and not reported.

*** Among female students, American Indian or Alaska Native students significantly differed from Asian students based on *t*-test analysis with Taylor series linearization (p<0.05).

††† Among female students, Asian students significantly differed from Black or African American students based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§ Among female students, Asian students significantly differed from White students based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶ Among female students, Asian students significantly differed from Hispanic or Latino students based on *t*-test analysis with Taylor series linearization (p<0.05).

**** Among female students, Asian students significantly differed from multiracial students based on *t*-test analysis with Taylor series linearization (p<0.05).

†††† Among male students, Black or African American students significantly differed from White students based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§ Among male students, Black or African American students significantly differed from Hispanic or Latino students based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶ Among male students, heterosexual students significantly differed from bisexual students based on *t*-test analysis with Taylor series linearization (p<0.05).

***** Among male students, gay students significantly differed from questioning students based on *t*-test analysis with Taylor series linearization (p<0.05).

††††† Among male students, bisexual students significantly differed from questioning students based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§ Based on YRBS question, students who choose the response "I describe my sexual identity some other way" when referencing their sexual identity.

¶¶¶¶¶ Among female students, students who had sexual contact with the opposite sex only significantly differed from students who had sexual contact with the same sex only based on *t*-test analysis with Taylor series linearization (p<0.05).

****** Among female students, students who had sexual contact with the same sex only significantly differed from students who had sexual contact with both sexes based on *t*-test analysis with Taylor series linearization (p<0.05).

†††††† Among male students, students who had sexual contact with the same sex only significantly differed from students who had sexual contact with both sexes based on *t*-test analysis with Taylor series linearization (p<0.05).

TABLE 3. Sex-stratified prevalence of asking for sexual consent verbally at last sexual contact by experiences of sexual violence and sexual behaviors among high school students — Youth Risk Behavior Survey, United States, 2023*

Experience of sexual violence or sexual behavior†	Asked for sexual consent verbally at last sexual contact§	
	Female % (95% CI)¶	Male % (95% CI)¶
Sexual violence		
Experienced sexual violence by anyone during the past 12 months**		
Yes	71.6 (67.6–75.4)	80.4 (71.0–87.3)
No	75.4 (72.1–78.4)	85.2 (82.5–87.5)
Experienced sexual dating violence during the past 12 months††,§§		
Yes	76.3 (70.8–81.1)	85.7 (75.3–92.1)
No	75.1 (72.2–77.9)	85.1 (82.4–87.5)
Ever experienced forced sex¶¶		
Yes	70.7 (64.3–76.4)	82.8 (74.1–89.0)
No	75.8 (73.0–78.4)	84.8 (82.0–87.2)
Sexual behavior		
Ever sexual intercourse***,†††,§§§		
Yes	76.3 (72.7–79.5)	86.8 (84.3–88.9)
No	70.6 (66.1–74.7)	80.2 (75.5–84.2)
First sexual intercourse before age 13†††,¶¶¶		
Yes	56.7 (44.8–67.9)	74.7 (61.3–84.6)
No	75.3 (72.5–78.0)	85.4 (83.0–87.5)
Currently sexually active†††,§§§,****		
Yes	77.2 (72.9–81.0)	87.2 (84.2–89.7)
No	72.1 (68.5–75.4)	82.8 (78.9–86.1)
Alcohol or drug use during last sexual intercourse††††,§§§§		
Yes	69.6 (59.7–78.0)	80.8 (73.1–86.6)
No	77.7 (74.4–80.6)	87.8 (84.9–90.2)
Condom use during last sexual intercourse†††,§§§,††††,¶¶¶¶		
Yes	80.5 (75.8–84.5)	90.4 (87.4–92.8)
No	72.3 (66.3–77.7)	80.9 (76.3–84.7)
Highly or moderately effective hormonal contraceptive method use during last sexual intercourse*****		
Yes	75.4 (69.5–80.5)	85.5 (77.6–90.9)
No	76.7 (69.9–82.4)	87.8 (84.4–90.6)
Condoms as primary contraceptive method during last sexual intercourse§§§,*****,§§§§§		
Yes	79.1 (71.7–84.9)	90.4 (87.0–93.0)
No	72.6 (67.5–77.2)	83.2 (78.6–86.9)
Received STI testing during the past 12 months¶¶¶¶¶		
Yes	73.8 (63.3–82.2)	81.3 (68.5–89.7)
No	74.4 (71.6–77.0)	85.1 (82.3–87.5)

Abbreviation: STI = sexually transmitted infection.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Unweighted counts indicating denominators for females and males for each experience of sexual violence and sexual behavior. The total number of students answering each question varied. Percentages in each category were calculated on the known data.

§ Prevalence of asking for sexual consent verbally was among those who ever had sexual contact. The total (N = 5,492 [2,662 females and 2,806 males]) is unweighted.

¶ Weighted.

** Includes 2,551 female and 2,755 male respondents.

†† Among students who dated or went out with someone during the 12 months before the survey.

§§ Includes 2,482 female and 2,709 male respondents.

¶¶ Includes 2,615 female and 2,770 male respondents.

*** Includes 2,646 female and 2,780 male respondents.

††† Pairwise *t*-tests were conducted to determine whether prevalence of asking for sexual consent verbally differed by each experience of sexual violence and sexual behavior among females. Differences are statistically significant at $p<0.05$.

§§§ Pairwise *t*-tests were conducted to determine whether prevalence of asking for sexual consent verbally differed by each experience of sexual violence and sexual behavior among males. Differences are statistically significant at $p<0.05$.

¶¶¶ Includes 2,626 female and 2,767 male respondents.

**** Includes 2,527 female and 2,675 male respondents.

†††† Among students who ever had sexual intercourse.

§§§§ Includes 1,873 female and 2,025 male respondents.

¶¶¶¶ Includes 1,794 female and 1,962 male respondents.

***** For use of highly or moderately effective hormonal contraceptive method and condom as primary contraceptive method, sample was restricted to those who ever had sexual intercourse with an opposite-sex partner.

††††† Includes 1,148 female and 1,198 male respondents.

§§§§§ Includes 1,668 female and 1,882 male respondents.

¶¶¶¶¶ Includes 2,600 female and 2,724 male respondents.

TABLE 4. Associations between asking for sexual consent verbally with experiences of sexual violence and sexual behaviors among high school students, by sex — Youth Risk Behavior Survey, United States, 2023*

Experience of sexual violence or sexual behavior	Asked for sexual consent verbally at last sexual contact†	
	Female aPR (95% CI)§	Male aPR (95% CI)§
Experience of sexual violence		
Experienced sexual violence by anyone during the past 12 months	0.87 (0.74–1.01)	0.76 (0.49–1.17)
Experienced sexual dating violence during the past 12 months¶	1.02 (0.76–1.37)	1.01 (0.54–1.90)
Ever experienced forced sexual intercourse	0.81 (0.65–1.01)	0.81 (0.46–1.42)
Sexual behavior		
Ever sexual intercourse	1.10 (1.00–1.22)**	1.20 (1.07–1.34)**,††
First sexual intercourse before age 13§§	0.42 (0.27–0.67)**,††	0.47 (0.28–0.79)**,††
Currently sexually active	1.14 (0.98–1.31)	1.26 (1.02–1.55)**,††
Alcohol or drug use during last sexual intercourse§§	0.67 (0.47–0.95)**,††	0.68 (0.43–1.05)
Condom use during last sexual intercourse§§	1.34 (1.04–1.74)**,††	1.43 (1.11–1.84)**,††
Highly or moderately effective hormonal contraceptive method use during last sexual intercourse¶¶	1.02 (0.77–1.34)	0.91 (0.58–1.42)
Condoms as primary contraceptive method during last sexual intercourse¶¶	1.31 (0.95–1.79)	1.43 (1.05–1.93)**,††
Received STI testing during the past 12 months	1.01 (0.68–1.49)	0.97 (0.45–2.07)

Abbreviations: aPR = adjusted prevalence ratio; STI = sexually transmitted infection.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because: 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Prevalence ratio of experiences of sexual violence and sexual behaviors comparing students who asked for sexual consent verbally to those who did not ask for sexual consent verbally, among students who ever had sexual contact.

§ aPR adjusted for age, race and ethnicity, and sexual identity.

¶ Among students who dated or went out with someone during the 12 months before the survey.

** Model-adjusted risk differences were assessed through pairwise comparisons of students who asked for verbal sexual consent versus those who did not. Differences were considered statistically significant at $p<0.05$.

†† aPRs were considered significant if the 95% CI did not cross the null value of 1.00.

§§ Among students who ever had sexual intercourse.

¶¶ Among students who ever had sexual intercourse with an opposite-sex partner.

Discussion

Findings from this report indicate that, in 2023, among those reporting ever having had sexual contact, approximately eight in 10 U.S. high school students asked for sexual consent verbally at last sexual contact. Reports of asking for sexual consent verbally among high school students were substantially higher in this study than among most college student samples in previous research (*1*–*3*,*8*). A few possible explanations exist for this observation. Conceptually, adolescents and young adults might be more attuned to the significance of consent through increased public discourse and intervention, resulting in potentially greater use of verbal consent, and all age groups are likely influenced by some desirability bias leading to any increased reporting of use of verbal consent on surveys. Methodologically, measurement of consent behaviors among college students often comprises questions that ask participants to describe consent cues they have used or select from an array of response options that include explicit and implicit verbal cues, among others (*8*). This difference in measures may also explain some discrepancies in the responses between high school and college students.

Although previous research suggested links between sexual violence victimization and decreased sexual communication (*7*), this report found no significant differences in the prevalence of asking for sexual consent verbally between those who had experienced sexual violence by anyone, sexual dating violence, or forced sex compared with those who had not. This finding suggests that consent-seeking behaviors were not associated, positively or negatively, with a history of experiencing sexual violence. Because of high rates of reporting for consent seeking in this report, limited variability might have reduced the ability to detect a relation between asking for sexual consent verbally and experiences of sexual violence. Furthermore, YRBS measures self-reported experiences of sexual violence victimization but not perpetration experiences. A history of sexual violence perpetration that involves nonconsensual sexual contact by definition might be associated with not asking someone for sexual consent at last sexual contact. Additional research examining a wider range of sexual violence and consent experiences (e.g., perpetration, explicit and implicit verbal cues, and explicit and implicit nonverbal cues) is needed to better understand the potential effects of experiencing sexual violence victimization on consent behaviors.

Overall, female students were less likely to ask for sexual consent verbally than male students. This difference might reflect more frequent sexual initiation by male compared with female students (*9*), activating consent that might be shaped by social or cultural sexual scripts and expectations (*10*). Furthermore, traditional gender-based roles and power

dynamics, which suggest that males, and not females, are responsible for initiating sexual behavior and gaining consent, might influence actions (*11*). Differences by sex also align with previous research citing sex discordance in communicating and interpreting sexual consent among females and males (*11*). Finally, considering the finding of age-related differences, particularly among females, future research should examine individual (e.g., attitudes and internalized gender roles) and relationship (e.g., length of time) factors (*12*) on consent-seeking behaviors across early versus later adolescent developmental periods.

Certain differences were found in asking for sexual consent verbally by race and ethnicity and sexual identity status. Among females, prevalence was highest among Asian students; among males, prevalence was lowest among Black students. Bisexual male students were more likely to ask for sexual consent verbally than heterosexual peers, and gay male students were more likely to ask for sexual consent verbally than those questioning their sexual identity. These findings are consistent with qualitative studies describing sexual minority adolescents and young adults' report of self-efficacy and comfort with sexual consent communication (*13*). Together, the findings in this report and others (*14*), emphasize the need for a more nuanced examination of how consent intersects with multiple identities and sexual activity norms and expectations. Sexual consent research primarily comprises White, heterosexual, and cisgender college student samples (*1*–*3*,*7*), which is insufficient for understanding consent among diverse populations (*13*,*14*). This report's findings begin to address this gap by presenting consent behavior among adolescents of various racial, ethnic, sexual, and gender identities in a nationally representative population-based sample. Future studies to explore sexual consent among adolescents across multiple intersecting identities could help address remaining gaps.

Adolescents who reported asking for sexual consent verbally reported higher prevalence of ever having had sexual intercourse, lower prevalence of first sexual intercourse before age 13 years, and higher prevalence of being currently sexually active (males only). Such associations might be due, in part, to the fact that explicit verbal consent is commonly used in the context of sexual intercourse (*3*) and, as adolescents have sexual intercourse, opportunities to ask for consent might be needed. Asking for sexual consent verbally was associated with lower prevalence of using alcohol or drugs during last sexual intercourse among female students, which is critical given robust evidence showing disproportionate experiences of substance use–related, nonconsensual sexual activity among college females (*15*). Studies note male students' frequent use of condoms, including as the primary contraceptive method during last sexual intercourse, and the association of frequent condom use with asking for sexual consent verbally could reflect that males might be more inclined to initiate consent through discussions of condom use, which is a common consent cue reported by young persons (*3*,*8*). In light of trending declines in condom use (https://www.cdc.gov/healthyyouth/data/yrbs/yrbs_data_summary_and_trends.htm) and high rates of sexually transmitted infections (STIs) among adolescents and young adults (https://www.cdc.gov/std/statistics/2022/slides/2022-STI-Surveillance-Adolescents-and-Young-Adults.pptx), this higher prevalence (80.5% and 90.4%) of condom use for any reason among female and male students who asked for sexual consent verbally is promising. Taken together, such findings might suggest an association between verbal consent and protective sexual behaviors, with verbal consent potentially reflecting a protective behavior as well. Comprehensive approaches to sexual health promotion and violence prevention could be leveraged to increase protective sexual behaviors including asking for verbal consent, using condoms, and avoiding alcohol and drug use before and during sexual activity. Furthermore, because of the lack of association between asking for sexual consent verbally and use of a moderately or highly effective contraceptive method among female students, future investigations could consider factors influencing contraceptive decision-making and the role consent plays for female students and their sexual partners.

Limitations

General limitations of the YRBS are available in the overview report of this supplement (*6*). The findings in this report are subject to at least six additional limitations. First, the reliance on a single item to measure asking for sexual consent verbally captures only one dimension of consent; it lacks depth in consistently examining other aspects (e.g., diversity in cues being asked, withdrawing or negotiating consent between partners, or for specific sexual acts). Second, asking for sexual consent verbally was presented in relation to last "sexual contact" and did not define specific behaviors (e.g., penetrative intercourse, hand-to-genital contact, and kissing), influencing interpretability. Sexual contact was possibly understood as distinct from other sexual behaviors measured on YRBS. Third, variation in recall periods across different behavioral measures (e.g., last sexual contact, last sexual intercourse, or the past 12 months) introduces complexities in understanding the context in which sexual consent was sought and should be considered. However, this report presents the first national estimates for asking for sexual consent verbally as an important first step in understanding adolescent consent-seeking behavior. Future studies could employ multidimensional scales to

capture the complexity and nuances of consent behaviors and experiences among adolescents (*3*,*16*). Fourth, sexual violence was measured with three items and might not encompass the full range of violence experienced by students. Fifth, disentangling condom use for pregnancy prevention versus STI and HIV prevention is not feasible. Although YRBS measures condom use as a primary method for pregnancy prevention (https://www.cdc.gov/healthyyouth/data/yrbs/questionnaires.htm), condom use for STI and HIV prevention is not explicitly measured and might differ by consent endorsement. Finally, because this analysis included only students who have ever had sexual contact, certain estimates (e.g., student groups stratified by race and ethnicity) with a denominator <30 were considered statistically unreliable and therefore suppressed (*7*).

Future Directions

These findings point to next steps for sexual consent research and practice to support adolescent sexual health education and violence prevention. Most importantly, future studies might be strengthened by employing comprehensive, multidimensional scales to determine complexity of consent behaviors. Guided by valid and reliable consent scales (*4*,*16*), public health surveillance and research measurement could be expanded to reflect the breadth and depth of consent in context of adolescents' overlapping identities, experiences of sexual violence, and the range of sexual contacts including with whom, how, and when adolescents engage in risky and protective sexual behaviors. More refined sexual consent measurement would contribute substantially to emerging evidence with adolescents (*4*,*5*,*12*) and more robust studies with young adult and college student samples (*1*–*3*).

Multicomponent prevention efforts also are needed to better understand and address the development of sexual communication skills and social norms that support consent behaviors among youths and young adults. Schools and youth-serving organizations are uniquely positioned to address consent knowledge, self-efficacy, and behaviors through skills-focused programming (*17*). CDC's Health Education Curriculum Analysis Tool (https://www.cdc.gov/healthyyouth/hecat/pdf/2021/hecat_module_sh.pdf) could help identify developmentally recommended, culturally responsive, and inclusive curricula across grades K–12. Consent education also is included in many sexual and teen dating violence prevention approaches. CDC's comprehensive dating violence prevention model, Dating Matters, teaches middle school students about healthy relationship skills, including consent communication, and has been found to reduce sexual violence, sexual harassment, and dating violence behaviors (https://vetoviolence.cdc.gov/apps/dating-matters-toolkit/). Health care providers can talk with adolescents about sexual consent and work to recognize occurrences of nonconsensual sexual activity, providing indicated care and referrals (*18*). Public health professionals also can help parents build skills for effectively and consistently communicating with their adolescents about consent, sexual behaviors (including condom negotiation), and preventing violence, because sexual communication is linked to increased parent-child communication about consent for both mothers and fathers (*19*).

Conclusion

Adolescents' awareness of and communication about sexual consent are critical components for preventing and reducing experiences of violence and promoting healthy sexuality. YRBS nationally representative data indicate asking for sexual consent verbally among U.S. high school students was high but varied by demographic characteristics and engagement in sexual behaviors. Differences were detected in verbal consent among female and male students, and in association with sexual intercourse, being currently sexually active (males only), condom use, older age at first sexual intercourse, and nonuse of alcohol and drugs during last sexual intercourse (females only). Future work to measure the complexity and multidimensional nature of consent behavior is needed and might guide prevention efforts addressing sexual health and violence prevention across settings. Schools and youth-serving organizations, as well as health care professionals and parents, have an important role in bolstering adolescents' communication, understanding, and use of consent with partners; participating in informed sexual decision-making; and reducing negative sexual health and violence outcomes.

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Conflicts of Interest

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Report of Unfair Discipline at School and Associations with Health Risk Behaviors and Experiences — Youth Risk Behavior Survey, United States, 2023

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Abstract

Relatively little is known about the association between school discipline and student health and well-being. Using CDC's 2023 Youth Risk Behavior Survey, CDC analyzed the prevalence of report of unfair discipline at school and associations with experiences at school, mental health, suicidal thoughts and behaviors, and health risk behaviors among high school students overall and stratified by race and ethnicity. Prevalence estimates, prevalence differences, and prevalence ratios adjusted for race (in overall models), grade, and sex were calculated. Overall, 19.3% of students reported receiving unfair discipline during the previous 12 months; Black or African American students had a higher prevalence (23.1%) compared with Hispanic or Latino students (18.4%) and White students (18.1%). Unfair discipline was reported among a majority of students who describe their sexual identity in some other way (besides gay, heterosexual, lesbian, bisexual, or questioning) for American Indian or Alaska Native (81.7%) and multiracial (57.1%) subgroups. Overall, report of unfair discipline was associated with every health risk behavior and experience examined, including being bullied at school or electronically, skipping school due to feeling unsafe, carrying a weapon at school, prescription opioid misuse, poor mental health, persistent feelings of sadness or hopelessness, seriously considered attempting suicide, and attempted suicide. This pattern of association was similar among most student groups in models stratified by race and ethnicity. This analysis is the first to demonstrate, among a nationally representative sample of high school students, that reports of unfair discipline are associated with various health risk behaviors and experiences. With these findings, public health and education practitioners can create interventions that equitably promote safe, supportive, and inclusive school environments for student health.

Introduction

Creating safe and supportive school environments is a goal for CDC and other Federal partners, as well as the school community consisting of students, families, teachers, staff members, and school administrators. Ideally, school discipline sets boundaries that are needed to create a school climate where all students can achieve success in academics and maintain health and well-being (*1*). Schools use discipline as a tool to address behavior that interferes with student learning or could affect the safety of the school environment (*1*). However, it is widely recognized that how discipline is implemented within schools can be problematic. Although many school systems have moved to create disciplinary methods that are more restorative, school discipline still most often encompasses exclusionary discipline and less severe forms of punishment, such as being sent to the principal's office. The Office for Civil Rights in the U.S. Department of Education defines exclusionary discipline as "the formal or informal removal, whether on a short-term or long-term basis, of a student from a class, school, or other educational program or activity for violating a school rule or code of conduct…includ[ing] detentions, in-school suspensions, out-of-school suspensions, suspensions from riding the school bus, expulsions, disciplinary transfers to alternative schools, referrals to law enforcement, and school related arrests" (*2*). Since 1990, decades of data and research have documented the negative outcomes linked to the receipt of these types of school discipline (*3*–*10*). Within the past 15 years, the American Psychological Association (*9*) and the American Academy of Pediatrics (*8*) have released reports against the broad and frequent use of exclusionary school discipline, citing the association between these types of discipline and poor academic outcomes, the link between

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these types of discipline and arrest and incarceration, and the ineffectiveness of these disciplinary policies in creating a safer school environment.

Few studies have investigated the relation between discipline and the health and well-being of students. A systematic review published in 2023 spanning the years 1990–2020 identified 19 studies that focused on the association between receipt of school discipline and health. Of these studies, 13 found a significant association (*10*). For example, report of suspension was associated with current tobacco use, drug use as an adult, clinical diagnosis of sexually transmitted diseases, antisocial behavior, self-injury for which the student received medical attention, depression, moderate to severe depressive symptoms, and death by suicide. In addition, report of suspension or detention was associated with future smoking experimentation. Report of suspension or expulsion was associated with borderline personality disorder and receipt of mental health services, and school-level disparities in the proportion of Black or African American (Black) students suspended compared with White students was associated with adjustment problems, such as self-report of getting mad easily (*10*). Despite this evidence, additional studies are needed for a more in-depth exploration of the link between school discipline and health.

Investigating the association between discipline and health is important to understand and promote health equity in schools. Extensive research has documented disparities among K–12 students in the receipt of discipline by demographic characteristics; male students compared with female students, students with disabilities compared with those without, and Black students compared with White students are disproportionately disciplined (*3*,*4*). The U.S. Department of Education has described the use of discipline as discriminatory against youths of color, and Black students in particular, creating disparities categorized as widespread and persistent (*11*). Since at least 1974 (*12*), schools have applied discipline disproportionately to Black students, and since the 1990s, the disproportionality for Black students has been at a rate two to three times higher relative to their enrollment and compared with White students (*13*–*15*). Broadening the extant literature to document the relation between discipline and health among Black students, to whom schools disproportionately apply discipline, is important. Regarding sexual identity, studies have also documented that students identifying as bisexual, gay, lesbian, questioning, or transgender are disciplined more often compared with heterosexual students (*4*). Identifying the health risk behaviors and experiences associated with unfair discipline among all students who experience bias, discrimination, marginalization, and racism because of their race and ethnicity, sex, sexual identity, or a combination of these characteristics is the first step needed to cultivate a school environment for students that is safe, supportive, inclusive, and fair.

This report establishes the prevalence and examines associations between the student report of unfair discipline at school, overall and stratified by race and ethnicity, and examines associations between the report of unfair discipline with health risk behaviors and experiences. Although the literature discussed previously has measured the objective receipt or report of discipline, this report focuses instead on students' report of whether they have received discipline that they believe to be unfair. In 2023, the U.S. Department of Education released guidance for schools to cultivate safe, supportive, inclusive, and fair school climates, outlining that a key strategy is to ensure that schools implement discipline fairly (*16*). Therefore, understanding receipt of discipline reported by students to be unfair, and the association between unfair discipline and health marks a novel contribution to the literature. In addition, this report addresses two major gaps in the literature on school discipline. First, this is the first analysis to investigate the association between report of unfair discipline and various health risk behaviors and experiences among a nationally representative sample of U.S. high school students. Second, this analysis is the first to include a comprehensive examination of the relation between discipline and health among many racial and ethnic categories, not limited to Black or White student experiences, and among students of diverse sexual identities. The findings in this report will be useful for public health practitioners, school leaders, teachers and staff members, students, and their families to begin to understand the full scope of health risk behaviors and experiences associated with report of unfair discipline. With these findings, public health and education practitioners can create interventions that equitably promote safe, supportive, and inclusive school environments for student health.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*17*). The prevalence estimates for report of unfair discipline at school and associations with multiple health risk behaviors and experiences for the overall study population and stratified by sex, race and

ethnicity, grade, and sexual identity are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

The variable of interest was, "During the past 12 months, have you been unfairly disciplined at school?" with response options of yes or no. This measure was adapted from the Perceptions of Racism in Children and Youth scale, a scale demonstrated to be valid and reliable among youths of color who were ethnically and racially diverse (*18*). Research conducted among Black students demonstrated that students distinguish between disciplinary action that is discriminatory compared with discipline that is warranted (*5*). Health risk behaviors and experiences that were investigated in association with report of unfair discipline are grouped into three categories: 1) experiences at school, 2) mental health and suicidal thoughts and behaviors, and 3) health risk behaviors (Table 1). Demographic measures include sex (female or male), race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black, Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], multiracial [selected >1 racial category] (persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic), grade (9, 10, 11, or 12), and sexual identity (heterosexual or LGBQ+, which includes bisexual, gay, lesbian, questioning [I am not sure about my sexual identity/questioning], or describe identity in some other way [I describe my identity some other way]).

Analysis

The prevalence of report of unfair discipline was estimated for all student respondents and stratified by race and ethnicity in combination with other demographic characteristics. Pairwise *t*-test analyses compared the prevalence of report of unfair discipline within a demographic characteristic. The prevalences of health behaviors and experiences were estimated among students who have and have not received unfair discipline. Logistic regression models were used to estimate the adjusted prevalence difference (aPD) and prevalence ratio (aPR) of each health behavior comparing student respondents who have and have not received unfair discipline. Differences were assessed on an absolute and relative scale. The prevalence estimates, aPDs, and aPRs are provided for all student respondents. In models for student respondents overall, aPDs and aPRs were adjusted for race and ethnicity, sex, and grade (operationalized as grades 9 and 10 versus grades 11 and 12), whereas models for racial and ethnic subgroups were adjusted only for sex and grade. Differences detected by *t*-test analyses were considered statistically significant at the $p<0.05$ level. Prevalence ratios were considered statistically significant if 95% CI did not cross the value of 1.0. Prevalence estimates with denominators <30 were considered statistically unreliable and therefore were suppressed (*17*), causing the results for NH/OPI students to not be presented for all analyses because of denominators <30. All prevalence estimates and measures of association were determined using Taylor series linearization. Prevalence difference and ratios were calculated using logistic regression with predicted marginals. All analyses were conducted using SAS-callable SUDAAN (version 11.0.3; RTI International) to account for the complex sampling design and weighting.

Results

Overall, 19.3% of student respondents reported unfair discipline during the previous 12 months (Table 2). Black students (23.1%) had a higher prevalence of report of unfair discipline compared with Hispanic students (18.4%) and White students (18.1%). AI/AN students had the highest absolute point prevalence (32.0%) and NH/OPI the lowest (13.4%); however, because of wide confidence intervals in the response data for AI/AN and NH/OPI groups, these estimates were not different from the prevalence estimates of all other racial and ethnic subgroups. Male students and younger students (in grades 9 and 10) had the highest prevalence of report of unfair discipline compared with their respective peers. Students who identify their sexual identity in some other way (23.8%) had a higher prevalence of report of unfair discipline compared with questioning students (14.2%), and questioning students had a lower prevalence of report of unfair discipline compared with heterosexual students (18.9%).

In all racial and ethnic subgroups, students in either grade 9 or 10 had the highest prevalence of report of unfair discipline. Male students had a higher prevalence of report of unfair discipline than female students among Black (26.2% versus 20.1%), Hispanic (20.7% versus 16.0%), and White (21.0% versus 14.3%) students. Questioning students had a lower prevalence of report of unfair discipline compared with heterosexual students among Black (12.6% versus 23.8%) and White (12.4% versus 18.0%) students. Many differences by sexual identity were noted among AI/AN and multiracial students, and students who identified in some other way most

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 1. Questions, response options, and analytic coding for included health risk behaviors and experiences among high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Experience at school			
Bullied at school or electronically	Combined question: During the past 12 months, have you ever been bullied on school property? and During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes or no and yes or no	Yes (yes to either question) versus no (no to both questions)
Skipped school due to feeling unsafe	During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?	0 days, 1 day, 2 or 3 days, 4 or 5 days, or ≥6 days	Yes (≥1 day) versus no (0 days)
Did not get mostly As or Bs	During the past 12 months, how would you describe your grades in school?	Mostly A's, mostly B's, mostly C's, mostly D's, mostly F's, none of these grades, or not sure	Do not get mostly A's and B's (mostly C's, mostly D's, mostly F's, none of these grades, or not sure) versus got mostly A's and B's (mostly A's or mostly B's)
Mental health and suicidal thought or behavior			
Poor mental health	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Never, rarely, sometimes, most of the time, or always	Yes (rarely, sometimes, most of the time, or always) versus no (never)
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every time for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes (≥1 time) versus no (0 times)
Health risk behavior			
Carried a weapon at school	During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club on school property?	0 days, 1 day, 2 or 3 days, 4 or 5 days, or ≥6 days	Yes (≥1 day) versus no (0 days)
Ever prescription opioid misuse	During your life, how many times have you taken prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes (≥1 time) versus no (0 times)
Poor sleep	On an average school night, how many hours of sleep do you get?	≤4 hours, 5 hours, 6 hours, 7 hours, 8 hours, 9 hours, or ≥10 hours	Yes (<8 hours) versus no (≥8 hours)

differed from the remaining sexual identity categories. Among AI/AN students, students who identified in some other way (81.7%) had a higher report of unfair discipline compared with questioning (12.1%) and heterosexual (26.6%) students. Among multiracial students, students who identified in some other way (57.1%) had a higher prevalence of report of unfair discipline compared with bisexual (29.3%), lesbian or gay (26.1%), questioning (17.9%), and heterosexual (16.7%) students. In addition, among multiracial students, LGBTQ+ students (32.6%) had a higher report of unfair discipline compared with heterosexual (16.7%) students.

Among students overall, report of unfair discipline was associated with a higher prevalence of every health risk behavior and experience on both an absolute and relative scale (Table 3). For example, associations encompassed experiences at school, including having been bullied at school or electronically, skipped school due to feeling unsafe, or did not get mostly As and Bs; health risk behaviors, including carried a weapon at school, ever prescription opioid misuse, or poor sleep; mental health problems, including poor mental health and persistent feelings of sadness or hopelessness; and suicide risk, including seriously considered attempting suicide and attempted suicide.

Comparisons by race and ethnicity were made to facilitate the examination of the association between report of unfair discipline and health and well-being within each racial and ethnic subgroup. Most behaviors among Black, Hispanic, and multiracial students and all behaviors among White students were associated with report of unfair discipline on an absolute

TABLE 2. Prevalence of report of unfair discipline at school among high school students, by race and ethnicity and selected characteristics — Youth Risk Behavior Survey, United States, 2023*

Characteristic	AI/AN[†,§] % (95% CI)	Asian[†,§] % (95% CI)	Black or African American[†,§] % (95% CI)	NH/OPI[†,§] % (95% CI)	White[†,§] % (95% CI)	Hispanic or Latino[†,§] % (95% CI)	Multiracial[†,§] % (95% CI)	Total % (95% CI)
Grade**								
9	28.7 (16.0–46.0)	25.2 (15.9–37.5)	28.6 (23.9–33.8)	—[††]	21.3 (17.5–25.7)	20.3 (16.8–24.3)	37.3 (27.9–47.8)	**23.6 (21.1–26.3)**
10	46.2 (24.1–70.0)	19.6 (13.0–28.5)	24.1 (19.1–29.9)	—	19.0 (16.2–22.1)	23.4 (19.8–27.4)	21.0 (13.0–32.2)	**21.1 (18.8–23.7)**
11	21.1 (8.0–45.0)	19.2 (11.7–29.9)	22.8 (16.7–30.3)	—	16.2 (13.4–19.4)	14.4 (11.7–17.7)	16.0 (8.1–29.2)	**16.7 (14.8–18.8)**
12	15.3 (7.0–30.3)	13.6 (7.8–22.8)	14.2 (7.9–24.4)	—	15.1 (12.6–17.9)	14.9 (10.5–20.8)	7.6 (4.6–12.5)	**14.4 (12.3–16.9)**
Sex[§§]								
Female	36.1 (19.2–57.3)	14.9 (9.6-22.5)	20.1 (15.7–25.3)	—	14.3 (12.3–16.5)	16.0 (14.2–18.0)	25.7 (19.5–33.0)	**16.4 (14.9–18.0)**
Male	26.1 (12.0–47.8)	22.2 (15.3–31.0)	26.2 (23.0–29.7)	—	21.0 (18.7–23.5)	20.7 (17.6–24.2)	19.8 (13.9–27.4)	**21.6 (19.9–23.4)**
Sexual identity[¶¶]								
LGBTQ+	45.8 (21.4–72.4)	19.0 (10.5–32.1)	20.0 (15.4–25.7)	—	17.3 (14.0–21.3)	15.1 (11.6–19.4)	32.6 (24.1–42.3)	**18.5 (15.9–21.4)**
Lesbian or gay	—	—	17.0 (8.7–30.4)	—	16.5 (10.1–25.6)	17.8 (9.2–31.4)	26.1 (13.8–43.6)	**18.3 (13.4–24.4)**
Bisexual	51.4 (26.7–75.5)	—	20.7 (14.6–28.5)	—	17.1 (12.9–22.3)	15.1 (9.4–23.5)	29.3 (19.9–40.9)	**18.3 (15.2–21.9)**
Questioning	12.1 (3.0–38.2)	—	12.6 (4.8–29.0)	—	12.4 (8.1–18.4)	16.4 (10.5–24.7)	17.9 (6.2–41.7)	**14.2 (10.2–19.3)**
Identify in some other way	81.7 (40.7–96.7)	—	28.2(14.7–47.2)	—	23.1 (15.6–32.6)	10.1 (3.5–25.8)	57.1 (39.0–73.6)	**23.8 (17.6–31.4)**
Heterosexual	26.6 (14.9–42.7)	18.3 (13.5–24.3)	23.8 (20.6–27.4)	16.2 (6.1–36.3)	18.0 (16.1–20.1)	18.6 (16.7–20.7)	16.7 (12.4–22.1)	**18.9 (17.6–20.2)**
Total	**32.0 (19.8–47.4)**	**19.0 (14.1–25.1)**	**23.1 (19.9–26.7)[¶]**	**13.4 (4.9–32.0)**	**18.1 (16.1–20.2)**	**18.4 (16.7–20.3)**	**22.4 (17.4–28.3)**	**19.3 (17.9–20.7)**

Abbreviations: AI/AN = American Indian or Alaska Native; NH/OPI = Native Hawaiian or other Pacific Islander.

* N = 20,103 respondents. The total number of students responding to each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† The total number of respondents varied by race and ethnicity category, with the following unweighted number of students responding to the discipline question: AI/AN = 839; Asian = 402; Black or African American = 1,242; NH/OPI =53; White = 4,568; Hispanic or Latino = 2,289; and multiracial = 1,078. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

§ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶ Significantly different from Hispanic or Latino and White students, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

** Among students overall, those in grades 9 and 10 significantly differed from students in grades 11 and 12. Among AI/AN students, students in grade 10 significantly differed from students in grade 12. Among Asian students, students in grade 9 significantly differed from students in grade 12. Among Black or African American students, students in grades 9 and 10 significantly differed from students in grade 12. Among Hispanic or Latino students, students in grade 9 significantly differed from students in grade 11, and students in grade 10 significantly differed from students in grades 11 and 12. Among multiracial students, students in grade 9 significantly differed from students in grades 10, 11, and 12, and students in grade 10 significantly differed from students in grade 12. Among White students, students in grade 9 significantly differed from students in grades 11 and 12, and students in grade 10 significantly differed from students in grade 12. Significance based on *t*-test analysis with Taylor series linearization ($p<0.05$).

†† Dashes indicate where prevalence estimates were suppressed because $n<30$.

§§ Female students significantly differed from male students among students overall, Black or African American students, Hispanic or Latino students, and White students, based on *t*-test analyses with Taylor series linearization ($p<0.05$).

¶¶ Among students overall, questioning students significantly differed from heterosexual students and students who identify in some other way. Among AI/AN students, students who identify in some other way significantly differed from heterosexual and questioning students, and questioning students significantly differed from bisexual students. Among Black or African American students, students who were questioning significantly differed from heterosexual students. Among multiracial students, LGBQ+ students significantly differed from heterosexual students, bisexual students significantly differed from heterosexual students, and students who identify in some other way significantly differed from heterosexual, lesbian or gay, bisexual, and questioning students. Among White students, questioning students significantly differed from heterosexual students. Significance based on *t*-test analysis with Taylor series linearization ($p<0.05$).

and relative scale (Table 4). In addition, all racial and ethnic subgroups had at least one association on the absolute and relative scales between report of unfair discipline and mental health and suicidal thoughts and behaviors. Among all racial and ethnic subgroups, approximately half of students who received unfair discipline had persistent feelings of sadness or hopelessness (ranging from 48.4% among Asian students to 77.6% among AI/AN students), approximately one fourth to one third seriously considered attempting suicide (ranging from 22.4% among Asian students to 36.8% among AI/AN students), and more than one in 10 students attempted suicide (ranging from 12.4% among Black students to 20.7% among multiracial students).

Discussion

Unfair discipline at school was demonstrated to be associated with a higher prevalence of every health risk behavior and experience examined, including being bullied at school or electronically, skipping school due to feeling unsafe, not getting mostly As and Bs, poor mental health, persistent feelings of sadness or hopelessness, seriously considering attempting suicide, attempting suicide, carrying a weapon at school, poor sleep, and prescription opioid misuse. These findings demonstrate that school discipline is an urgent public health problem. The importance of these findings is underscored by this being the first report to investigate the association between

TABLE 3. Prevalences, adjusted prevalence differences, and adjusted prevalence ratios for high school students that did and did not report receipt of unfair discipline at school, by selected health risk behaviors and experiences — Youth Risk Behavior Survey, United States, 2023*

Health risk behavior or experience†	Students that reported unfair discipline % (95% CI)	Students that did not report unfair discipline % (95% CI)	aPD§	aPR§	95% CI
Experience at school					
Bullied at school or electronically	41.6 (37.8–45.5)	20.9 (19.4–22.6)	21.7¶	2.05**	1.87–2.25
Skipped school due to feeling unsafe	21.8 (17.7–26.5)	11.2 (8.4–14.9)	11.2¶	2.00**	1.63–2.47
Did not get mostly As and Bs	37.3 (34.1–40.6)	25.4 (22.1–29.0)	10.6¶	1.42**	1.24–1.62
Mental health and suicidal thought or behavior					
Poor mental health	38.0 (34.5–41.7)	27.2 (25.1–29.3)	13.2¶	1.50**	1.34–1.66
Persistent feelings of sadness or hopelessness	53.1 (50.3–55.8)	37.5 (35.0–40.0)	18.1¶	1.49**	1.40–1.58
Seriously considered attempting suicide	29.1 (26.8–31.5)	17.5 (15.9–19.3)	12.5¶	1.73**	1.54–1.93
Attempted suicide	15.3 (13.2–17.6)	7.3 (6.4–8.4)	8.1¶	2.12**	1.80–2.48
Health risk behavior					
Carried a weapon at school	8.3 (6.1–11.3)	3.1 (2.1–4.5)	4.7¶	2.52**	1.90–3.35
Ever prescription opioid misuse	17.8 (15.8–20.0)	9.1 (8.1–10.2	8.5¶	1.95**	1.69–2.24
Poor sleep	81.2 (77.6–84.3)	75.5 (73.5–77.4)	7.0¶	1.09**	1.06–1.13

Abbreviations: aPD = adjusted prevalence difference; aPR = adjusted prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Refer to Table 1 for variable definitions.

§ aPDs and aPRs calculated using logistic regression models with predicted marginal proportions adjusted for race and ethnicity, grade, and sex.

¶ Statistically significant based on a pairwise difference from the aPD logistic regression model with predicted marginal proportions ($p<0.05$).

** Statistically significant; 95% CIs do not cross the value of 1.0.

school discipline and health and well-being using a nationally representative survey sample of U.S. high school students.

Among students who reported receiving unfair discipline at school, more than half reported persistent feelings of sadness or hopelessness, approximately one fourth to one third seriously considered attempting suicide, and more than one in 10 students attempted suicide. These findings are consistent with other research indicating that being suspended from school is associated with poor mental health and death by suicide (*10*). Students who reported receiving unfair discipline were also found to be more likely to report being bullied at school or electronically and skipping school due to feeling unsafe compared with students who did not report unfair discipline. Previous studies have found a relation between unfair discipline and negative experiences at school or avoiding school among students who experience discrimination. For example, LGBTQ+ students who are bullied also report receiving discipline related to their bullying victimization experience (*19*). Among Black students, the receipt of unfair discipline is a risk factor for skipping school or even changing school districts (*5*). Considering the dramatic increase in chronic absenteeism in recent years (https://www2.ed.gov/datastory/chronicabsenteeism.html), these findings suggest that school officials might need to consider alternatives to current approaches to discipline because by skipping school, certain students might be trying to avoid the experience of receiving discipline (*5*). Creating school environments that are inclusive and fair, while also maintaining safety, is a Federal strategy to ensure that all students succeed in school (*16*).

Among students overall, 19.3% of students reported receiving unfair discipline at school, and Black students (23.1%) were the only racial or ethnic group to have a significantly higher prevalence than other racial or ethnic groups (different from Hispanic and White students). This disproportionate report of unfair discipline is also demonstrated by data on disproportionate disciplinary practices at the school level, collected by the Office for Civil Rights within the U.S. Department of Education, which indicate that Black students in K–12 public schools are disciplined at a rate that is higher than any other racial or ethnic group (*15*). These racial disparities cannot be explained by differences in socioeconomic status (*3*,*13*), behavior (*3*,*4*), or academic performance (*14*). The disproportionate discipline that Black students receive is rooted in racially discriminatory policies and practices (i.e., structural racism) (*20*), which began with school desegregation and has continued to the present day (*12*). Black students also disproportionately experience consequences from receiving school discipline compared with White students, such as lower academic achievement (*4*,*7*), chronic absenteeism and dropping out (*4*,*5*), and arrest (*4*,*6*). The field of public health might benefit from using this evidence base to analyze data for action to create strategies to help the one in five students, overall, who report receiving unfair discipline.

A salient finding from this report is that 81.7% of AI/AN students and 57.1% of multiracial students who identify in some other way (as a sexual identity) reported receiving unfair discipline at school. In addition, one third of multiracial students who identify as LGBQ+ reported unfair discipline.

TABLE 4. Prevalences and 95% CIs, adjusted prevalence differences, and adjusted prevalence ratios for high school students that did and did not report receipt of unfair discipline at school, by race and ethnicity and selected health risk behaviors and experiences — Youth Risk Behavior Survey, United States, 2023*

Race or ethnicity†	Health risk behavior or experience§	Student reporting unfair discipline¶ % (95% CI)	Student not reporting unfair discipline¶ % (95% CI)	aPD**	aPR**	95% CI
American Indian or Alaska Native	**Experience at school**					
	Bullied at school or electronically	33.2 (14.8–58.9)	17.6 (10.7–27.4)	15.9	1.91	0.86–4.22
	Skipped school due to feeling unsafe	20.4 (6.7–47.8)	11.7 (5.8–22.2)	7.0	1.58	0.48–5.18
	Did not get mostly As and Bs	30.4 (14.0–54.1)	40.4 (26.2–56.5)	−3.6	0.91	0.52–1.59
	Mental health and suicidal thought or behavior					
	Poor mental health	26.4 (10.1–53.3)	34.0 (21.6–49.0)	−12.2	0.66	0.25–1.70
	Felt persistently sad or hopeless	77.6 (55.4–90.7)	43.9 31.2–57.6)	29.5††	1.65§§	1.16–2.34
	Seriously considered attempting suicide	36.8 (15.3–65.1)	13.3 (8.8–19.8)	23.1	2.72§§	1.17–6.32
	Attempted suicide	14.1 (5.7–31.0)	10.2 (6.3–16.2)	2.7	1.25	0.44–3.58
	Health risk behavior					
	Carried a weapon at school	1.1 (0.4–3.2)	1.4 (0.8–2.7)	—¶¶	0.98	0.35–2.75
	Ever prescription opioid misuse	11.2 (4.5–25.4)	12.8 (6.0–25.2)	−3.0	0.78	0.20–2.96
	Poor sleep	78.7 (46.2–94.1)	75.0 (57.7–86.9)	8.4	1.11	0.82–1.52
Asian	**Experience at school**					
	Bullied at school or electronically	31.0 (18.5–47.1)	17.1 (12.0–23.6)	13.7††	1.79§§	1.17–2.76
	Skipped school due to feeling unsafe	22.3 (10.8–40.4)	7.9 (3.9–15.2)	12.1††	2.49§§	1.58–3.90
	Did not get mostly As and Bs	17.3 (9.8–28.6)	14.4 (7.9–24.8)	1.1	1.07	0.58–2.00
	Mental health and suicidal thought or behavior					
	Poor mental health	32.9 (19.2–50.2)	19.9 (14.3–26.9)	15.6	1.80§§	1.08–3.01
	Felt persistently sad or hopeless	48.4 (35.2–61.9)	25.4 (19.5–32.3)	24.1††	1.96§§	1.44–2.66
	Seriously considered attempting suicide	22.4 (14.8–32.4)	9.7 (6.5–14.6)	14.1††	2.48§§	1.42–4.34
	Attempted suicide	17.5 (10.1–28.8)	6.4 (3.2–12.6)	11.4††	2.81§§	1.63–4.84
	Health risk behavior					
	Carried a weapon at school	4.4 (1.0–16.8)	2.2 (0.9–5.0)	1.5	1.06	0.38–2.97
	Ever prescription opioid misuse	17.5 (8.4–33.1)	8.2 (3.6–17.9)	9.2	2.11	0.64–6.99
	Poor sleep	79.6 (62.4–90.1)	83.0 (77.7–87.2)	−3.4	0.96	0.80–1.14
Black or African American	**Experience at school**					
	Bullied at school or electronically	29.8 (23.1–37.6)	13.6 (11.0–16.7)	16.3††	2.19§§	1.52–3.14
	Skipped school due to feeling unsafe	23.2 (15.4–33.4)	13.9 (9.0–20.8)	9.7	1.70	0.91–3.19
	Did not get mostly As and Bs	40.0 (35.6–44.5)	29.8 (24.5–35.8)	9.2††	1.31§§	1.05–1.63
	Mental health and suicidal thought or behavior					
	Poor mental health	38.4 (32.7–44.4)	24.2 (20.1–28.9)	16.8††	1.71§§	1.36–2.14
	Felt persistently sad or hopeless	52.1 (46.6–57.7)	36.4 (33.2–39.7)	19.1††	1.53§§	1.32–1.78
	Seriously considered attempting suicide	23.3 (19.9–27.1)	16.9 (13.3–21.2)	8.2††	1.49§§	1.13–1.97
	Attempted suicide	12.4 (9.4–16.1)	7.5 (5.7–9.8)	5.3††	1.71§§	1.15–2.54
	Health risk behavior					
	Carried a weapon at school	5.0 (2.6–9.4)	1.9 (1.2–3.1)	2.8	2.40§§	1.14–5.05
	Ever prescription opioid misuse	18.2 (14.4–22.7)	9.4 (7.1–12.2)	9.0††	1.96§§	1.45–2.64
	Poor sleep	82.2 (67.0–91.3)	78.8 (72.4–84.0)	5.2	1.07	0.93–1.22
White	**Experience at school**					
	Bullied at school or electronically	48.1 (44.0–52.1)	26.0 (23.9–28.1)	22.9††	1.89§§	1.66–2.15
	Skipped school due to feeling unsafe	20.8 (16.7–25.5)	9.3 (7.1–12.1)	12.1††	2.32§§	1.90–2.84
	Did not get mostly As and Bs	34.0 (29.9–38.3)	18.4 (15.5–21.8)	13.7††	1.74§§	1.49–2.03
	Mental health and suicidal thought or behavior					
	Poor mental health	40.2 (35.9–44.7)	29.5 (26.6–32.7)	13.3††	1.46§§	1.29–1.65
	Felt persistently sad or hopeless	53.8 (49.6–58.0)	36.9 (33.6–40.2)	20.1††	1.56§§	1.42–1.70
	Seriously considered attempting suicide	32.8 (29.7–36.0)	19.3 (17.2–21.5)	14.9††	1.78§§	1.59–2.00
	Attempted suicide	14.1 (10.9–18.1)	6.7 (5.3–8.5)	7.9††	2.18§§	1.74–2.74
	Health risk behavior					
	Carried a weapon at school	9.5 (5.8–15.4)	3.8 (2.2–6.3)	5.2††	2.36§§	1.73–3.23
	Ever prescription opioid misuse	16.3 (13.2–19.9)	8.1 (6.6–10.0)	8.6††	2.07§§	1.55–2.77
	Poor sleep	81.9 (76.9–86.0)	74.2 (71.6–76.5)	8.6††	1.12§§	1.06–1.18

See table footnotes on the next page.

TABLE 4. (*Continued*) Prevalences and 95% CIs, adjusted prevalence differences, and adjusted prevalence ratios for high school students that did and did not report receipt of unfair discipline at school, by race and ethnicity and selected health risk behaviors and experiences — Youth Risk Behavior Survey, United States, 2023*

Race or ethnicity†	Health risk behavior or experience§	Student reporting unfair discipline¶ % (95% CI)	Student not reporting unfair discipline¶ % (95% CI)	aPD**	aPR**	95% CI
Hispanic or Latino	**Experience at school**					
	Bullied at school or electronically	36.4 (28.3–45.4)	17.6 (15.4–20.1)	19.5††	2.13§§	1.72–2.64
	Skipped school due to feeling unsafe	23.7 (17.0–32.1)	14.0 (9.9–19.4)	10.7††	1.78§§	1.40–2.26
	Did not get mostly As and Bs	43.2 (37.0–49.7)	36.2 (30.9–41.7)	6.8	1.19	0.97–1.45
	Mental health and suicidal thought or behavior					
	Poor mental health	33.0 (25.5–41.6)	26.3 (23.8–28.9)	8.6††	1.33§§	1.04–1.71
	Felt persistently sad or hopeless	50.9 (45.4–56.4)	40.9 (37.1–44.8)	12.2††	1.30§§	1.18–1.44
	Seriously considered attempting suicide	25.2 (19.6–31.9)	15.8 (13.9–18.0)	10.6††	1.68§§	1.34–2.12
	Attempted suicide	17.1 (13.3–21.8)	7.6 (6.6–8.7)	9.6††	2.30§§	1.71–3.11
	Health risk behavior					
	Carried a weapon at school	8.3 (5.2–12.9)	2.9 (1.9–4.2)	4.8††	2.71§§	1.47–5.01
	Ever prescription opioid misuse	19.1 (15.4–23.4)	10.8 (9.3–12.4)	8.0††	1.76§§	1.28–2.42
	Poor sleep	80.0 (75.2–84.0)	74.5 (70.3–78.3)	7.3††	1.10§§	1.01–1.19
Multiracial	**Experience at school**					
	Bullied at school or electronically	56.6 (46.3–66.3)	16.0 (11.6–21.7)	37.9††	3.31§§	2.34–4.69
	Skipped school due to feeling unsafe	20.8 (12.2–33.2)	8.6 (4.9–14.5)	11.2††	2.29§§	1.21–4.34
	Did not get mostly As and Bs	38.8 (29.9–48.6)	24.0 (16.6–33.3)	13.8††	1.58§§	1.01–2.50
	Mental health and suicidal thought or behavior					
	Poor mental health	47.2 (36.2–58.6)	24.4 (19.3–30.3)	22.1††	1.91§§	1.41–2.60
	Felt persistently sad or hopeless	61.4 (53.4–68.8)	37.5 (30.6–44.9)	22.6††	1.59§§	1.32–1.92
	Seriously considered attempting suicide	32.6 (21.4–46.3)	18.8 (13.1–26.4)	12.1††	1.64§§	1.02–2.66
	Attempted suicide	20.7 (12.9–31.7)	10.3 (7.2–14.6)	8.4	1.79§§	1.01–3.17
	Health risk behavior					
	Carried a weapon at school	8.0 (4.4–14.2)	2.9 (1.4–5.8)	5.9	3.03	0.94–9.77
	Ever prescription opioid misuse	18.4 (13.1–25.3)	8.1 (5.5–11.7)	10.9††	2.35§§	1.39–3.96
	Poor sleep	82.6 (73.2–89.2)	81.2 (76.4–85.1)	4.0	1.05	0.96–1.14

Abbreviations: aPD = adjusted prevalence difference; aPR = adjusted prevalence ratio.

* The total number of respondents varied by race and ethnicity category, with the following unweighted number of students responding to the discipline question: AI/AN = 839; Asian = 402; Black or African American = 1,242; White = 4,568; Hispanic or Latino = 2,289; and multiracial = 1,078. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

§ Refer to Table 1 for variable definitions.

¶ Prevalence estimates and 95% CIs are not adjusted.

** aPD and aPR calculated using logistic regression models with predicted marginal proportions adjusted for grade and sex.

†† Statistically significant based on a pairwise difference from the aPD logistic regression model with predicted marginal proportions ($p<0.05$).

§§ Statistically significant; 95% CIs do not cross the value of 1.0.

¶¶ aPD = 0.0.

The Office for Civil Rights does not collect information on students' sexual and gender identity, so this finding represents a new data point in nationally representative data that document the experience of LGBQ+ students, specifically LGBQ+ students of color (AI/AN and multiracial students), and students who face discrimination because of both their racial and ethnic and sexual identities. Relatively little research has been conducted on students with both AI/AN or multiracial and LGBTQ+ identities, particularly in the area of unfair discipline; however, previous studies have found that school disciplinary action is applied disproportionately to LGBTQ+ students (*3*). The U.S. Department of Education also recognizes youths of color and LGBTQ+ students as groups who receive disproportionate discipline (*16*).

Schools play a vital role in creating safe and supportive environments that promote the well-being of all students; however, this report contributes to the literature that demonstrates the negative experiences associated with school discipline. Research demonstrates that racial disparities in discipline might be in part attributable to teacher and school administrator perceptions and attitudes (*3*,*14*), which might include racial bias and other forms of discrimination. Offering school-based supports (e.g., implementing curricula inclusive of LGBTQ+ topics and establishing affinity groups, such as genders and sexualities alliances) has been found to reduce health risk behaviors and experiences (*21*), and extending these practices to include professional development on cultural bias and anti-racist practices, as well as creating ethnic or cultural

affinity clubs, might foster a safe and supportive environment that promotes equity. For example, Boston Public Schools has developed the Equity Impact Analysis Tool (https://www.bostonpublicschools.org/cms/lib/MA01906464/Centricity/Domain/162/BPS%20Racial%20Equity%20Impact%20Tool%20in%20Word.pdf) to help school and district leaders determine whether existing and proposed policies, budget allocations, programs, professional development, and instructional practices are likely to close opportunity gaps for students with identities that have been marginalized.

These strategies are aligned with the U.S. Department of Education's Guiding Principles for Creating Safe, Inclusive, Supportive, and Fair School Climates (https://www2.ed.gov/policy/gen/guid/school-discipline/guiding-principles.pdf), which provides five guiding principles schools can follow to apply discipline fairly. Examples include creating an inclusive and welcoming environment for all students, hiring and maintaining a diverse school workforce, and involving the entire school community (students, parents, teachers, school staff members, and school leaders) in crafting fair disciplinary practices and tracking their fair implementation. Because of the finding that report of unfair discipline is associated with poor mental health and suicidal thoughts and behaviors, the importance of using data for action to nurture positive mental health and well-being for students who report unfair discipline cannot be overstated. To help address these findings, school leaders might choose to implement the six strategies from Promoting Mental Health and Well-Being in Schools: An Action Guide for School and District Leaders (https://www.cdc.gov/healthyyouth/mental-health-action-guide/pdf/DASH_MH_Action_Guide_508.pdf), which outlines how focusing on the diverse needs of students, promoting health equity, and providing opportunities for school staff members to receive training and services on mental health (among other strategies and approaches) can foster student mental health and well-being. The educational and public health guiding documents complement one another, providing school communities with a robust roadmap to prevent using discipline inequitably and address the health needs of students who have experienced discipline.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*17*). The findings in this report are subject to at least three additional limitations. First, because the data are cross-sectional, the variables associated with report of unfair discipline might be thought of as outcomes but they might in fact be co-occurring or serve as the reason for report of unfair discipline. Second, report of unfair discipline is self-reported experience; however, qualitative and quantitative research demonstrates that students are able to identify when discipline is unfair (*5*,*13*,*18*). Finally, students whose unfair discipline experience included expulsion might be underrepresented in this survey.

Future Directions

Future studies could use local school district YRBS data to examine associations between disciplinary practices and health. District administrators could use the YRBS data, along with other data available within their district, to triangulate findings that reveal more about the relation between discrimination, unfair discipline, and health. By centering the research conducted with Black students about their experiences with inequitable discipline, public health practitioners can learn from the established evidence to understand the experiences of other students who experience inequitable or unfair discipline, especially students who have identities that face bias and discrimination. For example, the finding that most AI/AN and multiracial students who identify their sexuality in some other way report receiving unfair discipline warrants additional exploration. The U.S. Department of Education also has described widespread and consistent disparities in school discipline between students with and without disabilities, and future research should examine the relation between discipline and health among students with disabilities. This report calls for public health practitioners, school administrators, families, youths, and community partners to reassess their district's current discipline-related policies and procedures, to recognize their association with health risk behaviors and experiences among students, and to create interventions that equitably promote safe, supportive, and inclusive school environments for student health.

Conclusion

Findings from this report provide considerable evidence that student report of unfair discipline at school is associated with poor mental health, suicidal thoughts and behaviors, and experiences of violence, in addition to concerning behavior such as prescription opioid misuse and skipping school due to feeling unsafe. These data are the first to present rigorous evidence from a nationally representative sample of U.S. high school students that links student report of unfair school discipline to health risk behaviors and experiences, foregrounding the current use of school discipline as an urgent public health concern. With these findings, public health and education practitioners can create interventions that equitably promote safe, supportive, and inclusive school environments for student health.

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Jonetta J. Mpofu reported being a board member of the American School Health Association. No other potential conflicts of interest were disclosed.

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Mental Health and Suicide Risk Among High School Students and Protective Factors — Youth Risk Behavior Survey, United States, 2023

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Abstract

Adolescent mental health and suicide risk remain substantial public health concerns. High pre-COVID rates of poor mental health and suicide-related behaviors have continued to rise, highlighting the need to identify factors that might foster positive mental health outcomes and reduce suicide-related behaviors at population levels. Using CDC's 2023 Youth Risk Behavior Survey, CDC analyzed the prevalence of mental health and suicide risk indicators and their associations with individual-, family-, and school- or community-level protective factors. Prevalence estimates were calculated for each of the mental health and suicide risk indicators by demographic characteristic. Prevalence ratios adjusted for sex, sexual identity, grade, and race and ethnicity were calculated to examine the association between protective factors and mental health and suicide risk indicators. Overall, 39.7% of students experienced persistent feelings of sadness and hopelessness, 28.5% experienced poor mental health, 20.4% seriously considered attempting suicide, and 9.5% had attempted suicide. Mental health and suicide risk indicators differed by sex, sexual identity, grade, and race and ethnicity. All protective factors were associated with lower prevalence of one or more risk indicators. Findings from this report can serve as a foundation for the advancement of research on protective factors and for the development and implementation of programs, practices, and policies that protect and promote mental health and emotional well-being among youth.

Introduction

Poor mental and behavioral health among adolescents remains a substantial public health concern. High pre-COVID rates of poor mental health and suicide-related behaviors have continued to rise, particularly among certain subgroups of youth such as female and lesbian, gay, bisexual, and questioning (LGBQ+) students (*1*–*3*). In 2021, suicide was the third leading cause of death among U.S. high school youth aged 14–18 years with 1,952 suicide-related deaths resulting in a rate of 9.0 per 100,000 youths (*2*). However, suicide attempts and suicidal thoughts among youth exceed deaths by suicide. The 2021 Youth Risk Behavior Survey (YRBS) found that approximately one third (30.0%) of female high school students and 14.3% of male high school students had seriously considered attempting suicide during the 12 months before the survey (*1*). YRBS data from 2021 also revealed that over 42% of high school students experienced persistent feelings of sadness or hopelessness during the past year, and 29% of high school students reported their mental health in the past 30 days was not good most of the time or always (*1*).

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In addition, data collected during July 2021–December 2022 on the Teen National Health Interview Survey of adolescents aged 12–17 years estimated that 21% of adolescents reported experiencing symptoms of anxiety in the past 2 weeks and 17% reported experiencing symptoms of depression (*3*).

Healthy People 2030 highlights the need for prevention and health promotion strategies to reduce suicide-related behaviors and improve mental health outcomes at the population level (*4*). YRBS monitors priority health behaviors and experiences and includes questions related to mental health and suicide and exposures to positive experiences and behaviors that might serve as protective factors. Protective factors are broadly defined as behaviors and characteristics of the adolescent's environment that are associated with decreased likelihood for experiencing negative outcomes or found to mitigate the negative effects of risk factors such as exposure to adversity (*5*). For example, physical activity, positive coping skills, and supportive social networks have been identified as protective factors that can reduce stress and enhance health (*4*,*5*).

This report summarizes 2023 YRBS data regarding mental health and suicide risk and examines associations with individual-, family-, and school- or community-level health-promoting behaviors and experiences (i.e., protective factors). Understanding the association between protective factors and mental health and suicide-related indicators is important for

identifying pathways to resiliency and guiding prevention efforts (*4*,*5*). Findings can be used to guide the design of interventions that promote and protect the mental health and well-being of youth and to inform decision-making among public health and educational leaders.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*6*). The prevalence estimates for all variables for the surveillance population overall and stratified by demographic characteristics are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. This activity was reviewed by CDC and was conducted consistent with applicable Federal law and CDC policy.*

Measures

This analysis examined two indicators of mental health and two indicators of suicide risk. Mental health indicators included 1) persistent feelings of sadness or hopelessness (past 12 months) and 2) poor mental health (always or most of the time, past 30 days). Suicide risk indicators included 1) seriously considered attempting suicide (past 12 months) and 2) attempted suicide (past 12 months). Six protective factors also were examined, including 1) physically active for ≥60 minutes/day ≥5 days, 2) getting ≥8 hours of sleep; 3) household adult tried to meet their basic needs (always), 4) parental monitoring (high), 5) school connectedness (high), and 6) played on ≥1 sports teams (Table 1). All variables were dichotomized and coded with the absence or lower exposure as the reference category.

Demographic variables included the following: sex (female and male), sexual identity (heterosexual, gay or lesbian, bisexual, questioning [I am not sure about my sexual identity/questioning], and students who describe their sexual identity in some other way [I describe my identity some other way]), grade in school (9, 10, 11, and 12), and race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], and Multiracial). (Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.)

Analysis

Descriptive analyses were conducted to determine the prevalence estimates and corresponding 95% CIs for each of the mental health and suicide risk indicators and each of the mental health and suicide risk indicators by each protective factor. Pairwise *t*-tests compared the prevalence of mental health and suicide indicators by demographic characteristic and by each protective factor. All prevalence estimates and measures of association used Taylor Series Linearization. Tests were considered statistically significant at the $p<0.05$ level.

Adjusted prevalence ratios (aPRs) were calculated using logistic regression with predicted marginals, which controlled for sex, sexual identity, grade, and race and ethnicity, to examine the association between protective factors and mental health and suicide risk indicators. The aPRs were considered statistically significant if the 95% CI did not cross the null value of 1.0. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Mental Health and Suicide Risk Indicators

Overall, 39.7% of students experienced persistent feelings of sadness and hopelessness, 28.5% experienced poor mental health, 20.4% seriously considered attempting suicide, and 9.5% attempted suicide (Table 2). The prevalence among female students was higher than among male students for persistent feelings of sadness or hopelessness (52.6% versus 27.7%), poor mental health (38.8% versus 18.8%), seriously considered attempting suicide (27.1% versus 14.1%), and attempted suicide (12.6% versus 6.4%). Similarly, the prevalence among LGBQ+ students was higher than among heterosexual students for persistent feelings of sadness or hopelessness (65.7% versus 31.4%), poor mental health (53.5% versus 21.5%), seriously considered attempting suicide (41.0% versus 13.0%), and attempted suicide (19.7% versus 6.0%).

Mental health and suicide risk indicators also differed by grade and by race and ethnicity (Table 2). The prevalence of attempted suicide was higher among students in 9th grade compared with students in 12th grade (10.4% versus 8.0%).

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

TABLE 1. Question and analytic coding for health behaviors and experiences, by variable assessed—Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic Coding
Mental health and suicide risk indicators			
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Poor mental health	During the past 30 days, how often was your mental health not good?	Never, rarely, sometimes, most of the time, or always	Yes (always, most of the time) versus no (sometimes, rarely, never)
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes, no	Yes versus no
Attempted suicide	During the past 12 months, how many times did you actually attempt suicide?	0 times, 1 time, 2 or 3 times, 4 or 5 times, or ≥6 times	Yes (≥1 times) versus no (0 times)
Protective factors			
Individual-level			
Physically active for ≥60 minutes/day ≥5 days	During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	Yes (≥5 days) versus no (≤4 days)
Getting ≥8 hours of sleep	On an average school night, how many hours of sleep do you get?	4 or less hours, 5 hours, 6 hours, 7 hours, 8 hours, 9 hours, or 10 or more hours	Yes (≥8 hours) versus no (≤7 hours)
Family/household-level			
Adult in your household tried hard to meet basic needs	During your life, how often has there been an adult in your household who tried hard to make sure your basic needs were met, such as looking after your safety and making sure you had clean clothes and enough to eat?	Always, most of the time, sometimes, rarely, or never	Always (always) versus not always (most of the time, sometimes, rarely, never)
Parental monitoring	How often do your parents or other adults in your family know where you are going or with whom you will be?	Never, rarely, sometimes, most of the time, or always	High (always, most of the time) versus low (sometimes, rarely, never)
School or community-level			
School connectedness	Do you agree or disagree that you feel close to people at your school?	Strongly agree, agree, not sure, strongly disagree, or disagree	High (strongly agree, agree) versus low (not sure, strongly disagree, disagree)
Played on ≥1 sports team	During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)	0 teams, 1 team, 2 teams, or ≥3 teams	Yes (≥1 team) versus no (<1 team)

Persistent feelings of sadness or hopelessness, poor mental health, seriously considered attempting suicide, and attempted suicide varied by race and ethnicity, but no consistent patterns emerged, with various significantly different group comparisons on different risk indicators. For example, compared with White students, Hispanic students had greater prevalence of persistent feelings of sadness or hopelessness (42.4% versus 38.9%) and attempted suicide (10.8% versus 8.3%). Conversely, White students had greater prevalence of poor mental health (31.4% versus 26.1%) and of seriously considering attempting suicide (22.1% versus 18.2%) compared with Hispanic students. Similarly, compared with White students, Black students had lower prevalence of poor mental health (26.5% versus 31.4%), but they had higher prevalence of attempted suicide (10.3% versus 8.3%). Asian students had lower prevalence of seriously considering attempting suicide compared with Black, Hispanic, multiracial, and White students (14.4% versus 19.6%, 18.2%, 21.6%, and 22.1% respectively).

Mental Health and Suicide Risk Indicators by Protective Factors

All protective factors were significantly associated with lower prevalence of one or more mental health and suicide risk indicators (Figure). Being physically active for ≥60 minutes/day on ≥5 days was associated with lower prevalence of having experienced persistent feelings of sadness or hopelessness (aPR = 0.92) (Supplementary Table, https://stacks.cdc.gov/view/cdc/160632). Getting ≥8 hours of sleep was associated with lower prevalence of all mental health and suicide risk indicators (aPR range = 0.53–0.67) as was having a household adult who always tried to meet their basic needs (aPR range = 0.41–0.80). High parental monitoring was associated with lower prevalence of all mental health and suicide risk indicators (aPR range = 0.51–0.74) except poor mental health. High levels of school connectedness were associated with lower prevalence of all mental health and suicide risk indicators (aPR range = 0.63–0.70). Playing on ≥1 sports team was associated with lower prevalence of all mental health and suicide risk indicators (aPR range = 0.84–0.90) except attempted suicide.

TABLE 2. Prevalence of mental health and suicide risk indicators among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Persistent feelings of sadness or hopelessness† % (95% CI)§,¶	Poor mental health† % (95% CI)§,¶	Seriously considered attempting suicide† % (95% CI)§,¶	Attempted suicide† % (95% CI)§,¶
Sex				
Female**	52.6 (50.1–55.0)	38.8 (36.2–41.4)	27.1 (24.7–29.6)	12.6 (11.2–14.2)
Male	27.7 (25.9–29.6)	18.8 (17.3–20.5)	14.1 (12.4–15.9)	6.4 (5.3–7.6)
Sexual Identity				
Heterosexual	31.4 (29.8–33.0)	21.5 (20.1–22.9)	13.0 (12.1–14.1)	6.0 (5.2–6.8)
LGBQ+††	65.7 (63.0–68.3)	53.5 (50.8–56.1)	41.0 (38.2–43.9)	19.7 (17.8–21.8)
Grade				
9§§	40.3 (37.3–43.4)	27.1 (24.3–30.1)	21.3 (18.7–24.3)	10.4 (9.0–11.9)
10	39.7 (37.1–42.3)	29.4 (26.8–32.2)	19.7 (17.9–21.6)	9.7 (8.2–11.4)
11	39.7 (36.4–43.1)	29.7 (26.6–32.9)	20.3 (17.3–23.5)	9.4 (7.7–11.3)
12	38.8 (35.7–42.0)	27.9 (25.7–30.2)	19.5 (17.0–22.3)	8.0 (6.3–10.2)
Race and ethnicity¶¶				
American Indian or Alaska Native***	44.8 (29.0–61.8)	42.3 (23.9–63.2)	24.5 (14.7–38.1)	11.5 (6.8–18.6)
Asian†††,§§§	32.1 (28.3–36.2)	23.0 (18.2–28.7)	14.4 (11.9–17.3)	8.0 (5.3–11.7)
Black or African American¶¶¶	39.6 (37.1–42.2)	26.5 (23.1–30.2)	19.6 (16.9–22.7)	10.3 (8.5–12.5)
Native Hawaiian or other Pacific Islander	25.8 (14.3–42.1)	14.9 (4.5–39.6)	16.1 (4.3–45.0)	15.3 (4.0–43.8)
White	38.9 (36.4–41.4)	31.4 (29.0–33.9)	22.1 (19.8–24.5)	8.3 (7.0–9.9)
Hispanic or Latino****,††††	42.4 (39.4–45.4)	26.1 (23.2–29.2)	18.2 (16.2–20.3)	10.8 (9.1–12.6)
Multiracial§§§§	41.4 (35.2–47.8)	28.9 (24.1–34.2)	21.6 (17.3–26.7)	11.4 (8.4–15.5)
Total	**39.7 (37.7–41.7)**	**28.5 (26.7–30.4)**	**20.4 (18.7–22.3)**	**9.5 (8.4–10.7)**

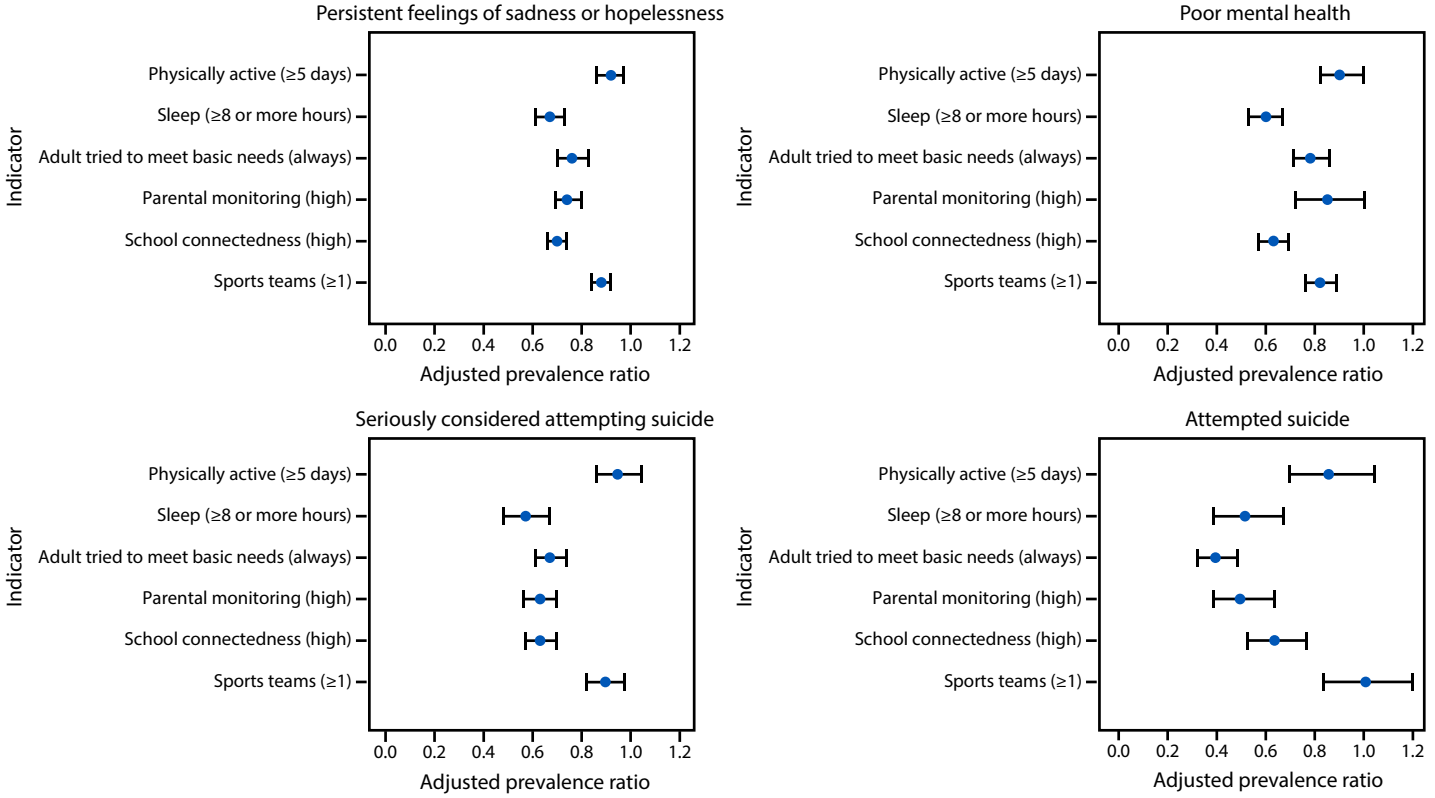
* N = 20,103 respondents. The total number (N) of students answering each question varied. Data may be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.
† Refer to Table 1 for variable definitions.
§ Percentages in each category are calculated on the known data.
¶ All prevalence estimates and measures of association used Taylor Series Linearization. Tests were considered statistically significant at the p<0.05 level.
** Female students had significantly different prevalences than male students on all mental health and suicide risk indicators (i.e., persistent feelings of sadness or hopelessness, poor mental health, seriously considering attempting suicide, suicide attempts).
†† LGBQ+ students had significantly different prevalences than heterosexual students on all mental health and suicide risk indicators (i.e., persistent feelings of sadness or hopelessness, poor mental health, seriously considering attempting suicide, suicide attempts).
§§ 9th Graders had significantly different prevalence of suicide attempts than 12th graders.
¶¶ Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.
*** American Indian or Alaska Native had significantly different prevalence of poor mental health than Native Hawaiian or Other Pacific Islander (NH/OPI) students.
††† Asian students had a significantly different prevalence of persistent feelings of sadness or hopelessness and seriously considered attempting suicide than Black, Hispanic, Multiracial, and White students.
§§§ Asian students had a significantly different prevalence of poor mental health than White students.
¶¶¶ Black students had a significantly different prevalence of poor mental health and attempted suicide than White students.
**** Hispanic students had a significantly different prevalence of persistent feelings of sadness or hopelessness than NH/OPI and White students.
†††† Hispanic students had a significantly different prevalence of poor mental health, seriously considered attempting suicide, and attempted suicide than White students.
§§§§ Multiracial students had a significantly different prevalence of persistent feelings of sadness or hopelessness than NH/OPI students.

Discussion

Overall, results from the 2023 YRBS illustrate the high prevalence of mental health and suicide-related risk indicators among U.S. adolescents. Nearly one in three students experienced poor mental health most of the time or always during the 30 days before the survey, over one in three students felt persistent sadness or hopelessness for 2 weeks or more during the 12 months before the survey, one in five students seriously considered attempting suicide during the 12 months before the survey, and nearly one in 10 students attempted suicide during the 12 months before the survey. The prevalence of mental health and suicide-related risk indicators was high across all demographic groups; however, prevalence was highest among female students and LGBQ+ students. Compared with male students, female students were about twice as likely to have experienced each mental health and suicide risk indicator, and compared with their heterosexual peers, LGBQ+ students were two to three times as likely to have experienced the risk indictors measured.

Such disparities among girls and LGBQ+ youth have been highlighted previously (*1*–*3*). The past six cycles of YRBS data (2011–2021) have shown female students with higher prevalence of persistent feelings of sadness or hopelessness and higher prevalence of suicide risk indicators than male students (*1*). Likewise, examination of emergency department (ED) usage data collected in the 2018 to 2021 National Hospital Ambulatory Medical Care Survey (NHAMCS) and

FIGURE. Adjusted prevalence ratio* of mental health and suicide risk indicators, by individual-level, household-level, and school or community-level protective factors† — Youth Risk Behavior Survey, United States, 2023§



* Adjusted prevalence ratios were calculated using logistic regression with predicted marginals, controlled for sex, sexual identity, grade, and race and ethnicity. Adjusted prevalence ratios were considered statistically significant if the 95% CIs did not cross the null value of 1.0. Bars indicate 95% CI.
† Refer to Table 1 for variable definitions.
§ N=20,103 respondents. The total number (N) of students answering each question varied. Data may be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

data from the National Syndromic Surveillance Program have described sex differences in ED visits related to mental health where adolescent girls were treated for mental health disorders such as depression, anxiety, and trauma and stressor-related disorders at higher rates than boys (*7*,*8*). For girls, research has shown differences in the mental health impact of academic stress, cultural expectations, social media use, and violence (*9*). In addition, as described in previous YRBS surveillance reports (*1*), findings from analysis of 2023 YRBS data indicated that LGBQ+ students were more likely to experience mental health and suicide risk than their heterosexual peers. Stress associated with rejection, marginalization, and discrimination and with trauma related to personal victimization contribute to depressive symptoms, suicide risk, and other disparities in behavioral health outcomes for LGBQ+ youth (*10*).

Differences by race and ethnicity were identified for each mental health and suicide risk indicator. For example, Hispanic/Latino students were more likely to report persistent feelings of sadness or hopelessness during the past year and were also more likely to have attempted suicide than White students. However, White students reported a higher prevalence of suicidal ideation during the past year compared with Asian and Hispanic/Latino students. Demographic differences need further investigation because research has documented disparities in mental health outcomes and suicide risks for racial and ethnic minority adolescents. For example, 2018–2021 NHAMCS data indicated that mental health related ED visits were higher among Black youths than Hispanic and White youths (*7*). In addition, the prevalence of seriously considered attempting suicide increased significantly during 2019–2021 among Black, Hispanic, and White female students and among Hispanic male students (*1*). The nuanced patterns found in 2023 YRBS data, combined with patterns of increased risk for negative mental health and suicide-related outcomes among racial and ethnic minority students shown in previous studies (*1*–*3*,*7*,*8*), underscore the importance of culturally tailored prevention interventions, including suicide awareness and mental health literacy efforts that reduce stigma and support

help seeking (https://www.cdc.gov/minority-health/features/minority-mental-health.html).

Findings from this report suggest ways that individual behaviors, household experiences, and community/school influences might attenuate mental health and suicide risk and might facilitate trajectories that lead to positive health behaviors and outcomes. In this analysis, students who reported being physically active ≥60 minutes on ≥5 days, getting adequate sleep ≥8 hours, having a household adult who always tried to meet their basic needs, high levels of parental monitoring, high levels of school connectedness, and playing on a sports team had lower prevalence of at least one mental health and suicide risk indicator, which is consistent with previous research.

Certain studies have documented the positive effects of physical activity on self-esteem, relationships, academic achievement, and physical and mental health (https://health.gov/healthypeople/tools-action/browse-evidence-based-resources/physical-activity-guidelines-americans-2nd-edition). In addition, physical activity and attending physical education classes during an average week have been associated with higher levels of feeling close to persons at school, which has protective effects related to emotional well-being along with potential to prevent and mitigate health risks (5). However, previous research indicates that not all students have equal access or opportunities for engaging in physical activity (11). For example, LGBQ+ students have reported lower levels of physical activity because of feeling uncomfortable and unsafe in physical activity-related settings (e.g., physical education classes and locker rooms) (12).

The relation between sleep and mental health also is well documented. For adolescents, adequate sleep (getting ≥8 or more hours) is critical for cognitive development and emotional well-being (*5*), whereas insufficient sleep (getting <8 hours) can compromise functioning across several domains, including emotional regulation, mood, and stress reactivity (*13*). The findings in this report indicate that getting the recommended ≥8 hours of sleep was associated with a lower prevalence of all mental health and suicide risk indicators, underscoring the benefits of adolescents getting adequate sleep. However, many adolescents get less than the recommended hours of sleep (*13*). Further research examining factors that influence adolescent sleep patterns and strategies for improving sleep duration and quality (e.g., school start times, quantity of homework, students' technology and social media use, afterschool activities, and employment responsibilities) are needed to identify ways to bolster this foundational protective factor.

Consistent with previous studies on parental monitoring and adolescent mental health and suicide outcomes, high parental monitoring was associated with lower risk for persistent feelings of sadness and hopelessness, suicidal thoughts, and suicide attempts (*14*). Previous research indicates that the extent to which parents are aware of adolescents' whereabouts is influenced by both parental behaviors (e.g., soliciting information) and adolescent perspectives (e.g., relationship satisfaction with parent) (*15*). As such, higher levels of parental monitoring might indicate more positive communication and connectedness between adolescents and their parents, which in turn has been linked to reduced risk for mental health and suicide outcomes (*15*).

Having a household adult that always tried to meet basic needs was associated with a lower prevalence of all mental health and suicide risk indicators. Caregiver nurturance and stable caregiving have been found to moderate academic, social, and psychological resilience in youth (5). This is especially evident among youth exposed to concentrated disadvantage, such as exposure to community violence and being in foster care (5,16).

The findings in this report also highlight the potential benefits to mental health of playing on a school or community sport team. Other research indicates that participation in team sports might promote mental health because of opportunities to build social relationships that foster a sense of connection and belonging (17). However, cost, time, and lack of inclusive spaces are barriers to team sport involvement that have been highlighted previously and elevate the need for more affordable and inclusive local opportunities for youth to participate (11,12,18).

Finally, school connectedness was associated with lower risk for all mental health and suicide indicators. This adds to previous evidence on the important role that safe and supportive school environments play in supporting students' mental health and well-being during adolescence and into adulthood (*5*,*19*). However, research has also shown that female, Black, Hispanic, and LGBQ+ youth and youth who have experienced racism feel less connected to school than their peers, highlighting the importance of creating opportunities for connectedness and belonging for students at higher risk for feeling marginalized at school (*19*).

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*6*). The findings in this report are subject to at least four additional limitations. First, causality and direction of associations between protective factors and student behaviors and experiences cannot be inferred by these cross-sectional data. Referring to variables as "protective factors" denotes a conceptual naming convention, backed by extant literature; however, because temporality

cannot be parsed out from these surveillance data, these factors might not always occur before the outcome. Second, individual-level behaviors, household experiences, school or community influences, and mental health and suicide risk indicators have differing recall periods and different time reference points, which might contribute to recall bias and affect validity of constructs and comparability of items. Third, the interrelated qualities of protective factors cannot be disentangled with these data; therefore, their independent contribution to an association with a mental health or suicide risk indicator cannot be assessed. Finally, socioeconomic status of a student's household and community have been shown to modify the relation between protective factors and mental health indicators; however, these variables could not be accounted for because they are not measured in the survey.

Future Directions

The high prevalence of poor mental health and suicide risk indicators among female students and LGBQ+ students and differences by race and ethnicity underscore the urgency for comprehensive research to explore factors that contribute to these disparities. Such work is critical to informing the design of public health interventions and programming to reduce suicide risk and improve mental health outcomes for youth. In addition, because of the importance of protective factors in improving health, even in the face of risk behaviors and negative experiences, it is important to consider monitoring additional protective factors in future survey research. Research also is needed to examine the dimensions of protective constructs used in this analysis through more nuanced, multi-item measures and scales, along with relations between protective factors. Finally, further examination of programs, initiatives, or interventions is necessary to ensure they promote protective experiences and address barriers to access across subpopulations, which might be essential for meeting the needs of adolescents at the highest risk of negative outcomes.

Conclusion

During 2023, significant differences in mental health outcomes and suicidal thoughts and behaviors among youth were observed across sex, sexual identity, and race and ethnicity. The findings in this report also found that protective factors at the individual-, family-, school-, and community-levels were associated with decreased mental health and suicide risk among high school students. Findings from this report can serve as a foundation for the advancement of research on associations between protective factors and mental health among youth. Results highlight the need for the development and implementation of inclusive, culturally, and linguistically appropriate programs, practices, and policies that protect and promote mental health and emotional well-being among youth. Moreover, as part of a larger comprehensive suicide prevention approach, strategies that both reinforce youth health-promoting behaviors and experiences at multiple levels and consider the role of cultural differences across demographic groups might be more effective in bolstering youth mental health and reducing suicidal thoughts and behaviors. CDC's Promoting School Mental Health and Wellbeing: An Action Guide for School and District Leaders (https://www.cdc.gov/healthyyouth/mental-health-action-guide/index.html), the What Works in Schools program (https://www.cdc.gov/healthyyouth/whatworks/index.htm), and the Suicide Prevention Resource for Action (https://www.cdc.gov/suicide/resources/prevention.html) provide strategies for school, district, and community leaders based on the best available evidence for promoting mental health and emotional well-being and preventing suicide.

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Conflict of Interests

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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Skipping Breakfast and Academic Grades, Persistent Feelings of Sadness or Hopelessness, and School Connectedness Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Breakfast consumption is positively associated with academic achievement and diet quality among students, whereas skipping breakfast has been linked with poor mental health. Data from CDC's 2023 nationally representative Youth Risk Behavior Survey were used to describe how often high school students ate breakfast in the past 7 days and the associations between skipping breakfast every day (ate breakfast on 0 of the past 7 days), experiencing persistent feelings of sadness or hopelessness, school connectedness, and self-reported grades. Prevalence estimates and corresponding 95% CIs were calculated, and *t*-tests were used to identify differences within demographic groups (e.g., sex, race and ethnicity, and sexual identity). Logistic regression analyses were conducted to calculate prevalence ratios describing breakfast skipping, adjusting for demographics, and stratified by sex and race and ethnicity. Most students missed breakfast ≥1 time in the past 7 days (72.6%), and 17.9% of students skipped breakfast every day, with differences by sex, sexual identity, and race and ethnicity. Overall, and among both males and females, students who experienced persistent feelings of sadness or hopelessness were more likely to skip breakfast every day. The association between feelings of sadness and hopelessness and skipping breakfast was generally consistent across racial and ethnic groups. In contrast, greater levels of school connectedness and earning mostly As or Bs were inversely associated with skipping breakfast. Students who had higher school connectedness were approximately 30% less likely to skip breakfast on all 7 days. Skipping breakfast and poor mental health co-occur among many adolescents and might impede students' readiness to learn. School efforts to make breakfast accessible and appealing to high school students might yield multiple benefits and help reinforce school administrators' efforts to recover student learning losses that occurred during the COVID-19 pandemic. Parents, school decision-makers, and organizations that partner with schools and families can use these findings to guide efforts to promote breakfast consumption.

Introduction

At the beginning of the 2022–23 school year, many school administrators faced pressure to address declines in students' mental health and accelerate learning recovery (*1*). Identifying strategies that could support the mental health of students and improve their readiness to learn became paramount. Promoting breakfast consumption can be one such strategy.

Compared with skipping breakfast, consuming breakfast can help support students' readiness to learn and has been associated with better cognitive performance and academic achievement (*2*) and diet quality (*3*). Healthier dietary patterns, including higher whole grain, fruit, and vegetable intakes, have been positively associated with measures of executive functioning, such as inhibitory control and attention (*4*). A systematic review of longitudinal studies and randomized clinical trials found that, in 10 of 11 studies, eating breakfast more frequently was associated with diet quality improvements in children and adolescents (*5*). Previous analyses of Youth Risk Behavior Survey (YRBS) data have demonstrated that daily breakfast consumption among adolescents has been declining since 2009 (*6*). This is concerning because, beyond its relevance for academic outcomes, breakfast consumption and, more specifically, the lack of breakfast consumption (i.e., skipping breakfast) has been linked to indicators of poor mental health among adolescents (e.g., depression, stress, psychological distress, and anxiety) (*7*).

To help guide schools' efforts to better support students' mental health, CDC highlights the relevance of school connectedness, which is associated with better mental health and academic outcomes and can also be protective against a broader set of adverse health behaviors and experiences (*8*). However, the relation between school connectedness and breakfast has not been previously explored, a gap noted in a

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review about breakfast and the achievement gap among urban, minority youths (*9*). This report estimates the prevalence of breakfast skipping, overall and by demographic characteristics, and describes the association between skipping breakfast and persistent feelings of sadness or hopelessness and school connectedness, both among students overall and stratified by sex and race and ethnicity. Parents, school decision-makers, and organizations that partner with schools and families can use these findings to guide efforts to promote breakfast consumption.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*10*). The prevalence estimates for all variables for the study population overall and stratified by demographic characteristics are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

Measures

Breakfast frequency was assessed using a single question: "During the past 7 days, on how many days did you eat breakfast?" Skipping breakfast was defined as consuming breakfast on 0 of the past 7 days. Experiencing persistent feelings of sadness or hopelessness, experiencing school connectedness, and reporting receiving mostly As and Bs in school were each assessed using a single question: "During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?", "Do you agree or disagree that you feel close to people at school?", and "During the past 12 months, how would you describe your grades in school?" (Table 1). Demographic variables included sex (male and female), race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Hispanic or Latino [Hispanic], multiracial, Native Hawaiian or other Pacific Islander [NH/OPI], and White), grade (9 and 10 versus 11 and 12), and sexual identity (heterosexual, gay or lesbian, bisexual, questioning [I am not sure about my sexual identity/questioning], or identify in some other way [I describe my identity some other way]). (Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.)

TABLE 1. Question wording and analytic coding for included youth behavior and experience variables — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Breakfast consumption	During the past 7 days, on how many days did you eat breakfast?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, 7 days
Skipping breakfast every day	During the past 7 days, on how many days did you eat breakfast?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	0 days, ≥1days
Experienced persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes or no
School connectedness	Do you agree or disagree that you feel close to people at school?	Strongly agree, agree, not sure, disagree, or strongly disagree	Strongly agree/agree versus not sure/disagree/strongly disagree
Mostly As or Bs	During the past 12 months, how would you describe your grades in school?	Mostly A's, Mostly B's, Mostly C's, Mostly D's, Mostly F's, none of these grades, or not sure	Mostly A's/B's, Mostly C's/D's/F's None of these grades/not sure = missing

Analysis

The prevalence of students eating breakfast on 0 to 7 days in the 7 days before taking the survey was estimated for the overall sample. In addition, the prevalence of skipping breakfast every day ("breakfast skipping"; eating breakfast on 0 of the past 7 days) was stratified by sex, race and ethnicity, grade, and sexual identity group. All prevalence estimates are weighted and presented with 95% CIs. Pairwise *t*-tests were used to identify demographic differences in prevalence estimates. Prevalence ratios, stratified by sex and race and ethnicity and adjusted for sex, race and ethnicity, sexual identity, and grade, were calculated to estimate associations between skipping breakfast and persistent feelings of sadness or hopelessness,

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

school connectedness, and receiving mostly As and Bs, using a separate model for each measure. Prevalence differences and ratios were calculated using logistic regression with predicted marginals. All prevalence estimates and measures of association used Taylor series linearization. Prevalence estimates with a denominator <30 were considered statistically unreliable and therefore were suppressed (*10*); accordingly, estimates for NH/OPI students are not presented for analyses stratified by race and ethnicity. Prevalence ratio estimates were considered statistically significant if the 95% CI did not cross the null value of 1.0. *T*-tests were considered statistically significant at the p<0.05 level. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

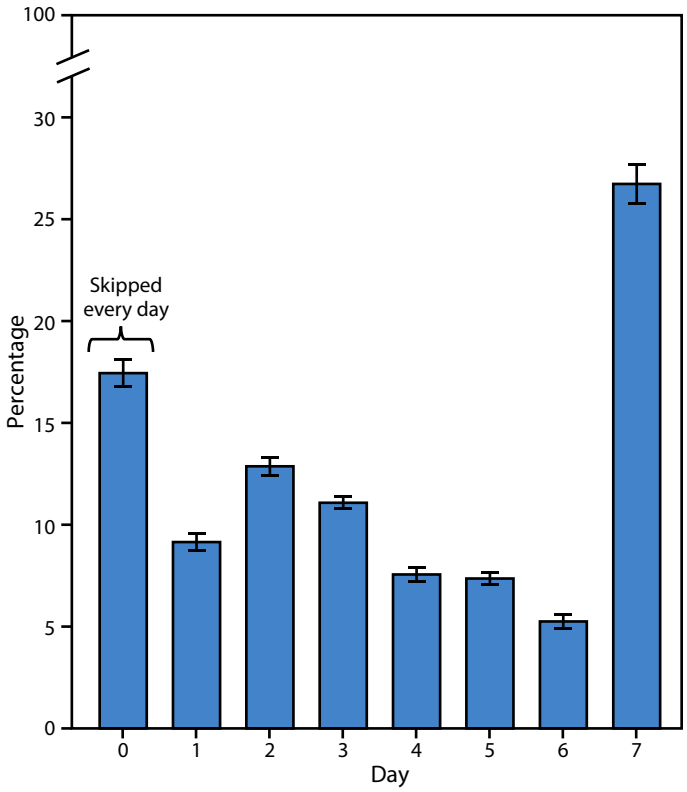
Results

Overall, 27.4% of students ate breakfast every day in the past 7 days (Figure). Cumulatively, more than half of students (51.8%) consumed breakfast on 3 or fewer days, and 17.9% of students skipped breakfast every day. Female students had a higher prevalence of skipping breakfast every day than males (19.7% versus 16.2%). Racial and ethnic differences were observed in the percentage who skipped breakfast every day. A larger proportion of Hispanic students (20.0%) reported skipping breakfast every day than White (16.2%) or AI/AN (11.1%) students. Students who identified as heterosexual reported a lower prevalence of skipping breakfast every day (15.8%) than students who identified as gay or lesbian (23.3%), bisexual (25.0%), or questioning (20.7%) (Table 2).

Experiencing persistent feelings of sadness or hopelessness in the past 12 months was associated with being more likely to skip breakfast every day in the overall sample, as well as among both male and female students and among some, but not all, racial and ethnic groups. Female students who reported persistent feelings of sadness or hopelessness were 64% (adjusted prevalence ratio [aPR] = 1.64) more likely to skip breakfast every day, and males were 37% (aPR = 1.37) more likely to skip breakfast every day compared with those who did not report persistent feelings of sadness or hopelessness in the past year. Prevalence of skipping breakfast every day was higher among students that experienced persistent feelings of sadness or hopelessness for students of most racial and ethnic backgrounds, except among AI/AN and multiracial students (Table 3).

Students who felt connected to school were less likely to skip breakfast every day overall, for female and male students, and AI/AN, Black, and White students. In the overall sample, school connectedness was associated with students being 27% less likely to skip breakfast every day (aPR = 0.73), with estimates for racial and ethnic groups ranging from 23% less likely among White students (aPR = 0.77) to 86% less likely among AI/AN students (aPR = 0.14) (Table 3).

FIGURE. Prevalence of breakfast consumption during the past 7 days among students in grades 9-12, by total number of days — Youth Risk Behavior Survey, United States, 2023*



* Bars indicate 95% CI.

Students who received mostly As or Bs were less likely to skip breakfast everyday overall, among both female and male students, and among students from most racial and ethnic groups, except for among Black and Hispanic students. Female students who received mostly As or Bs were 33% less likely to skip breakfast every day and males were 37% less likely to skip breakfast compared with students who earned mostly Cs, Ds, and Fs. Asian, multiracial, and White students who earned mostly As or Bs were also less likely to skip breakfast every day (Table 3).

Discussion

During 2023, most high school students were not eating breakfast daily, and approximately one in six students skipped breakfast on all 7 days before taking the survey. Skipping breakfast every day was more prevalent among female students than male students and among Hispanic students than White

TABLE 2. Percentage of skipping breakfast every day among high school students — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Skipping breakfast (Ate breakfast on 0 of the past 7 days) % (95% CI)
Sex†	
Female	19.7 (18.1%–21.5%)
Male	16.2 (14.4%–18.1%)
Race and ethnicity†,§	
American Indian or Alaska Native	11.1 (5.7–20.5)
Asian	15.8 (12.3–20.1)
Black or African American	18.4 (15.7–21.4)
Native Hawaiian or other Pacific Islander	24.0 (14.2–37.7)
White	16.2 (14.7–17.9)
Hispanic or Latino	20.0 (17.4–22.9)
Multiracial	17.9 (14.6–21.7)
Grade†	
9–10	17.7 (15.9–19.7)
11–12	17.9 (16.5–19.3)
Sexual identity†,¶	
Heterosexual	15.8 (14.3–17.5)
Gay or Lesbian	23.3 (18.3–29.2)
Bisexual	25.0 (21.2–29.2)
Identify in some other way	19.1 (15.1–23.7)
Questioning	20.7 (16.3–25.9)
Total	**17.9 (16.5–19.4)**

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.
† Significant difference at p<0.05 calculated using *t*-tests with Taylor series linearization: Prevalence of skipping breakfast (unadjusted): male <female; American Indian or Alaska Native, White <Hispanic or Latino; heterosexual <gay or lesbian, bisexual, questioning; describe another way <bisexual.
§ Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.
¶ Students self-identified their sexual identity with the following response options: heterosexual, gay or lesbian, bisexual, I describe my identity some other way, I am not sure about my sexual identity (questioning).

students. Cross-sectional data from the Cannabis, Obesity, Mental health, Physical Activity, Alcohol, Smoking, and Sedentary behavior (COMPASS) study in Canada found that skipping breakfast was more common among students who were trying to lose weight and who were not involved in sports (*11*), characteristics that were also more common among female students than male students in 2021 YRBS data and might contribute to the observed sex differences in skipping breakfast (*6*). This report is the first analysis of nationally representative data to examine differences in breakfast skipping by sexual identity and found that skipping breakfast every day was more prevalent among lesbian or gay, bisexual, or questioning youths than among their heterosexual counterparts.

Consistent with existing research, the findings in this report indicate that symptoms of poor mental health (i.e., persistent feelings of sadness or hopelessness) were associated with skipping breakfast every day (*7*). Most studies, including this study, examining the association between breakfast consumption and mental health (e.g., anxiety, depressive symptoms, and stress) in adolescents have been cross-sectional (*7*), limiting understanding of potential causal mechanisms. Other research has linked regular breakfast intake with improvements with diet quality (*3*,*5*), which can help support mental health in children and adolescents (*12*).

Many youths are missing the potential benefits of regular breakfast consumption, including youths experiencing persistent feelings of sadness and hopelessness. Although this report is unable to specify how poor mental health and breakfast skipping influence one another, the findings contribute to a body of literature demonstrating that youths who skip breakfast more frequently are also at greater risk for poor mental health (*7*). Together, these studies illustrate the importance of ensuring that students who are struggling with symptoms of poor mental health are prioritized for efforts to decrease breakfast skipping.

In addition, this study examined the relation between school connectedness and breakfast skipping because researchers have 1) explicitly called for better exploration of connectedness and dietary behaviors and 2) have highlighted school connectedness as an important factor for supporting mental health and a wide range of health and academic outcomes (*8*,*9*). Social connectedness, more broadly, and school connectedness, specifically, have been elevated by the U.S. Surgeon General as means of improving population-level physical and emotional well-being. This report also is the first to use national YRBS data to examine the relation between school connectedness and a dietary behavior. Findings suggest that higher levels of school connectedness were associated with being less likely to skip breakfast, addressing a noted gap in the evidence (*9*).

This report found an inverse relation between breakfast skipping and students reporting earning mostly As or Bs, underscoring previously observed associations between breakfast consumption and grades. However, the relation between breakfast skipping, grades, and school connectedness was not explored, which is a topic for future research.

Because of the phrasing of the questions and the cross-sectional nature of data in this study, certain questions of interest cannot be answered. For example, it was not possible to differentiate between eating breakfast at home or at school and, without longitudinal data, it was not possible to assess whether school connectedness promotes breakfast eating or vice versa. Students who experience higher levels of school connectedness might have other characteristics that favor breakfast consumption, such as participating in extracurricular sports or better mental health.

TABLE 3. Percentage of feelings of persistent sadness or hopelessness, school connectedness, academic grades, and skipping breakfast among high school students, by sex and race and ethnicity — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Experienced persistent feelings of sadness or hopelessness % (95% CI)	Experienced greater school connectedness % (95% CI)	Reported receiving mostly As or Bs % (95% CI)
Skipping breakfast (Ate breakfast on 0 of the past 7 days)			
Overall prevalence	23.2 (21.1–25.4)	15.1 (13.1–17.4)	15.4 (13.7–17.2)
Overall prevalence ratio	1.61 (1.41–1.84)	0.69 (0.59–0.80)	0.64 (0.56–0.73)
Adjusted prevalence ratios (aPR)†	**aPR (95% CI)**	**aPR (95% CI)**	**aPR (95% CI)**
Overall§	1.51 (1.32–1.73)	0.73 (0.64–0.84)	0.65 (0.56–0.75)
Sex¶			
Female	1.64 (1.29–2.07)	0.72 (0.61–0.85)	0.67 (0.53–0.85)
Male	1.37 (1.16–1.62)	0.74 (0.63–0.87)	0.63 (0.54–0.72)
Race and ethnicity,††			
American Indian or Alaska Native	3.47 (0.88–13.78)	0.14 (0.05–0.37)	2.09 (0.56–7.85)
Asian	1.53 (1.05–2.24)	0.59 (0.28–1.25)	0.35 (0.19–0.65)
Black or African American	1.37 (1.06–1.79)	0.63 (0.47–0.85)	0.85 (0.65–1.13)
Native Hawaiian or other Pacific Islander§§	—	—	—
White	1.49 (1.22–1.81)	0.77 (0.65–0.93)	0.57 (0.48–0.66)
Hispanic or Latino	1.65 (1.23–2.22)	0.75 (0.53–1.08)	0.76 (0.56–1.03)
Multiracial	1.14 (0.77–1.69)	0.76 (0.45–1.27)	0.51 (0.32–0.84)

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.
† aPRs were considered statistically significant if the 95% CIs did not cross the null value of 1.0.
§ Adjusted for sex, sexual identity, grade, and race and ethnicity.
¶ Adjusted for sexual identity, grade, and race and ethnicity.
** Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.
†† Adjusted for sexual identity, grade, and sex.
§§ Values suppressed in cells where N <30; estimates for Native Hawaiian or other Pacific Islander not shown.

Strategies to increase school connectedness might indirectly support breakfast consumption by increasing students' wanting to be at school and their attendance, which could lead to eating breakfast at school. Alternatively, a welcoming school breakfast program that fosters social inclusion and belonging might contribute to greater school connectedness. Findings from the COMPASS study also indicated that students with higher levels of school connectedness participated in school breakfast programs more often than those with lower connectedness (*11*). Although neither this analysis nor the analysis from COMPASS can establish causality, the plausibility of both interpretations and the broad benefits of regular breakfast consumption suggest that school efforts to make breakfast appealing and accessible could positively influence multiple outcomes (*3*,*7*,*9*).

Although schools are not the only place where breakfast is consumed, they are of strategic importance. At the household level, socioeconomic and behavioral factors, such as food availability, household income, parental education level, two-parent households, and parental breakfast consumption, are known correlates of adolescent breakfast intake (*13*). These factors are not readily modifiable to increase adolescents' opportunities to eat breakfast. In contrast, approximately 90,000 schools and institutions already participate in the U.S. Department of Agriculture's School Breakfast Program (SBP), which makes breakfast available to youths at a paid, reduced, or free cost, depending on household income level. As a result, many schools have an existing infrastructure to build from when designing approaches to support breakfast consumption.

Schools can consider various strategies to reduce skipping breakfast, such as standards-based health education, including teaching students about the benefits of eating breakfast every day, as described in the Food and Nutrition module of CDC's Health Education Curriculum Analysis Tool. Although health education can influence knowledge and attitudes about breakfast consumption, students need opportunities to apply what they are learning. Participating in SBP might be one way for schools to help address disparities in breakfast consumption and help students to overcome individual and household factors (e.g., timing, logistics, or feeling rushed; low household income; and household food insecurity) that might make it difficult to regularly consume breakfast (*9*,*13*) while providing a balanced meal that meets nutrition standards. The Community Preventive Services Task Force recommends Healthy School Meals for All (https://www.thecommunityguide.org/findings/social-determinants-health-healthy-school-meals-all.html), which makes school meals available at no cost to all students in a qualifying school without asking families to fill out applications, as a strategy to advance health equity. Such universal school meal programs were widely implemented during the emergency phase of the COVID-19 pandemic but became less common once the Federal waivers supporting this flexibility expired during the 2022–23 school year, when these

YRBS data were collected. Data from the 2022–23 school year indicate decreased participation in school breakfast and a widening gap between breakfast and lunch participation, with the exception of states that had passed legislation to adopt Healthy School Meals for All or had high uptake of the Community Eligibility Provision (*14*). The Community Eligibility Provision offers a mechanism for higher poverty districts, or individual schools within a district, to provide Healthy School Meals for All. This is relevant because universal school meals are associated with higher SBP participation and attendance and might be an important complement to school activities to narrow disparities in academic outcomes, especially because students in higher poverty school districts experienced greater losses in reading and math achievement during the COVID-19 pandemic, compared with students in lower poverty school districts (*1*).

High schools have successfully increased SBP participation by using alternative breakfast models, such as breakfast in the classroom or grab-and-go breakfasts (*15*), which are designed to give students an opportunity to have breakfast after the school day has begun, removing the need to arrive at school early to eat breakfast and reducing any stigma associated with eating breakfast in the cafeteria (*9*), while minimally disrupting learning time. It is unknown how either alternative or traditional cafeteria-based breakfast programs influence school connectedness among high school students or whether intentional program design could enhance connectedness.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (*10*). The findings in this report are subject to at least six additional limitations. First, the direction of association between skipping breakfast and the behaviors of interest cannot be assessed because of the cross-sectional nature of the data. Second, behaviors and experiences in these analyses have different recall periods (e.g., past 12 months and past 7 days) and might be subject to different recall bias. Third, a single item that focused on whether students feel close to persons at school was used to estimate school connectedness, which certain studies measure as a multidimensional construct (*8*). Fourth, household income might influence breakfast consumption, self-reported grades, and dietary intake; however, it was not possible to adjust for this potentially confounding variable. Fifth, self-reported grades are a limited measure of academic performance. Finally, the measure of breakfast consumption focused solely on frequency. Without information about the location or composition of breakfast, the role that school breakfast programs or breakfast quality play in the observed associations cannot be estimated.

Future Directions

A novel finding from this study is that students with higher levels of school connectedness, a known protective factor against poor mental health and risky health behaviors (*8*), were less likely to skip breakfast. The relation between school connectedness and breakfast consumption, including the role of school breakfast programs, merits additional exploration through longitudinal designs that include grades 9–12. States, schools, and districts that implement Healthy School Meals for All programs often evaluate program impact on attendance and academic achievement. A systematic review of the impacts of alternative breakfast models found that few of the included studies featured high school students in the United States. Of those, two reported on academic outcomes and none reported on classroom behavior (*15*). Although the studies were limited in number, the results were promising; both reported significant improvements in attendance after the adoption of alternative breakfast models (*15*). The findings in this report also are consistent with extant literature noting a cross-sectional relation between breakfast consumption and indicators of emotional well-being among adolescents (*7*). Together, these findings point to the relevance of including measures of school connectedness and youth mental health alongside indicators of academic achievement and attendance when evaluating the impact of different school breakfast models and Healthy School Meals for All. In addition, studies or evaluations using designs that can help disentangle co-occurring experiences and identities (e.g., gender and sexual identity) are needed to advance causal inferences and help identify potential causal mechanisms.

Conclusion

Most students skipped breakfast at least once in the past 7 days and 18% skipped breakfast every day. Students who skipped breakfast every day were less likely to report school connectedness or earning mostly As or Bs and more likely to report symptoms of poor mental health. Families influence adolescents' breakfast consumption at home by providing breakfast and role modeling eating breakfast; however, this might be logistically or economically infeasible in certain households (*7*). Schools can consider alternative school breakfast models, which can increase participation rates and attendance (*15*). Researchers have an opportunity to advance the field by exploring whether strategies to increase breakfast or school breakfast consumption, such as Healthy School Meals for All and alternative serving models, improve students' school connectedness, grades, and mental health outcomes and whether these benefits differ by student characteristics (e.g.,

sex, sexual identity, and race and ethnicity). Parents, school decision-makers, and organizations that partner with schools and families can use these findings to guide efforts to promote breakfast consumption.

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Conflicts of Interests

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Sarah A. Sliwa reported being a part-time adjunct faculty member at Tufts University Friedman School of Nutrition Science and Policy and being an unpaid advisory board member for Concrete Jungle, a nonprofit organization based in Atlanta, Georgia. No other potential conflicts of interest were disclosed.

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Physical Activity Behaviors and Negative Safety and Violence Experiences Among High School Students — Youth Risk Behavior Survey, United States, 2023

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Abstract

Schools are in a unique position to offer opportunities for students to be physically active throughout the school day and promote health and well-being. However, experiences that threaten safety or perceptions of safety might affect students' physical activity behaviors. Using the 2023 national Youth Risk Behavior Survey, six physical activity behaviors and five negative safety and violence experiences were examined from a nationally representative sample of U.S. high school students. This report updates national estimates for physical activity behaviors overall and by sex, grade, race and ethnicity, and sexual identity. In addition, associations between negative experiences and physical activity behaviors were examined, stratified by sex, via unadjusted and adjusted prevalence ratios. Regardless of negative safety and violence experiences, male students had a higher prevalence of meeting aerobic, muscle-strengthening, and both aerobic and muscle-strengthening physical activity guidelines compared with female students. In adjusted models among female students, a positive association was observed between being threatened or injured with a weapon at school and meeting the aerobic guideline, meeting the muscle-strengthening guideline, and playing on ≥1 sports team. Among male students, positive associations were observed between witnessing neighborhood violence and meeting the aerobic guideline and the muscle-strengthening guideline. A negative association was observed between attending physical education classes on all 5 days and witnessing neighborhood violence among female students and being bullied electronically among male students. Physical activity might serve as a mechanism that students employ to cope with negative safety and violence experiences. Understanding current physical activity behaviors among students with these negative experiences will be useful for school leaders, teachers, and public health practitioners who influence physical activity infrastructure and programming in schools and work to support safe, supportive, and inclusive school environments for student health. Although future research is needed to further explore these associations, physical activity continues to be an important behavior to prioritize for adolescent health in the school setting.

Introduction

Physical activity is important for preventing chronic disease, improving physical and mental health, and improving cognitive functioning (*1*). The Federal *Physical Activity Guidelines for Americans*, second edition, recommends that children and adolescents aged 6–17 years engage in 60 minutes or more of mostly aerobic moderate-to-vigorous physical activity each day (aerobic guideline), as well as muscle-strengthening physical activity on at least 3 days each week (muscle-strengthening guideline) (*1*). In addition, physical activity can serve as a protective factor that promotes the health and emotional well-being of children and adolescents (*2*). Schools are in a unique position to offer opportunities for students to be physically active throughout the school day as part of a Comprehensive School Physical Activity Program (https://www.cdc.gov/healthyschools/physicalactivity/pdf/2019_04_25_PE-PA-Framework_508tagged.pdf) to help meet the youth physical activity guidelines. Lack of physical activity can negatively affect students' physical and mental health, and have long-term health implications for various health conditions including heart disease, obesity, and type 2 diabetes (*1*). However, even when opportunities for physical activity exist, additional factors, such as students' actual or perceived lack of safety, might affect physical activity behaviors (*3*). Studies also have demonstrated that consistent sex disparities in students' physical activity exist (*4*). For example, in 2021, a higher percentage of male than female students met the aerobic and muscle-strengthening guidelines, attended physical education classes on all 5 days, and played on ≥1 sports team (*5*). Furthermore, another study suggests that negative safety and violence experiences for male students might have different associations with physical activity

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than for female students (*6*). Therefore, it could be important to consider how safety and violence affect participation in physical activity by sex alongside appropriate physical activity infrastructure and programming.

The association between physical activity behavior and negative safety and violence experiences (i.e., experiences of violence and bullying) among students has not been examined using nationally representative data in more than a decade (*6*), and it merits being revisited, especially as concerns around school safety and violence have persisted. CDC's Youth Risk Behavior Survey Data Summary & Trends Report: 2011–2021 (https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBS_Data-Summary-Trends_Report2023_508.pdf) demonstrates that the prevalence of students skipping school due to feeling unsafe has increased and the prevalence of being bullied electronically has not changed (although school-based bullying has declined). Public health and health professionals, state and local health officials, policymakers, and school leaders can use these findings to explore lack of safety as a factor that might influence the implementation of equitable school-based physical activity policies and practices. Understanding current physical activity behaviors among students with these negative experiences will be useful for practitioners who influence physical activity infrastructure and programming in schools and work toward safe, supportive, and inclusive school environments for student health.

Methods

Data Source

This report includes data from the 2023 YRBS (N = 20,103), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of public and private school students in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (*7*). The prevalence estimates for physical activity and negative safety and violence experiences for the study population overall and stratified by demographic characteristics are available at https://nccd.cdc.gov/youthonline/App/Default.aspx. The full YRBS questionnaire, data sets, and documentation are available at https://www.cdc.gov/yrbs/index.html. Institutional review boards at CDC and ICF, the survey contractor, approved the protocol for YRBS. Data collection was conducted consistent with applicable Federal law and CDC policy.*

*45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Measures

Six physical activity behaviors and five negative safety and violence experiences were examined for this report (Table 1). The physical activity behaviors included being physically active for ≥60 minutes per day on all 7 days (i.e., met the Federal youth aerobic guideline), exercising to strengthen or tone muscles on ≥3 days (i.e., met the Federal youth muscle-strengthening guideline), meeting both youth aerobic and muscle-strengthening guidelines, playing on ≥1 sports team, attending physical education classes on all 5 days, and attending physical education classes ≥1 day during an average week.

The negative safety and violence experiences included skipping school due to feeling unsafe, being threatened or injured with a weapon on school property, witnessing neighborhood violence, being bullied at school, and being bullied electronically. Demographic variables included sex (female and male), grade (9, 10, 11, and 12), sexual identity (heterosexual; lesbian, gay, or bisexual; questioning [I am not sure about my sexual identity/questioning] or describe identity in some other way [I describe my identity some other way]), and race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Native Hawaiian or other Pacific Islander [NH/OPI], White, Hispanic or Latino [Hispanic], or multiracial [selected >1 racial category]. (Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.)

Analysis

Prevalence and 95% CIs for each physical activity behavior were estimated, overall and by demographic characteristics. Differences between demographic subgroups were determined by pairwise *t*-test analyses. In addition, the prevalence and 95% CIs of each physical activity behavior were estimated, overall and stratified by sex, among students who did and did not have negative safety and violence experiences. Sex-stratified prevalence ratios (PRs) and adjusted PRs (aPRs) were calculated to assess the association between each physical activity behavior and each experience (adjusted for grade, race and ethnicity, and sexual identity). All prevalence estimates and measures of association were determined using Taylor series linearization. PRs and aPRs were calculated using logistic regression with predicted marginals. PRs were considered statistically significant if 95% CIs did not include a value of 1.0 or $p<0.05$. All analyses were conducted in SAS-callable SUDAAN (version 11.0.3; RTI International) using sample weights to account for complex survey design.

TABLE 1. Questions, response options, and analytic coding for physical activity behavior and negative safety and violence experiences among high school students — Youth Risk Behavior Survey, United States, 2023

Variable	Question	Response option	Analytic coding
Were physically active for a total of ≥60 minutes per day on all 7 days (i.e., met aerobic guideline)	During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	Yes (7 days) versus no (<7 days)
Did exercises to strengthen or tone muscles on ≥3 days (i.e., met muscle-strengthening guideline)	During the past 7 days, on how many days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	Yes (≥3 days) versus no (<3 days)
Met both aerobic and muscle-strengthening guidelines	[See "were physically active for a total of ≥60 minutes per day on all 7 days" and "did exercises to strengthen or tone muscles on ≥3 days."]	NA	Physically active for ≥60 minutes per day on all 7 days and did exercises to strengthen or tone muscles on ≥3 days versus physically active for ≥60 minutes per day on <7 days or did exercises to strengthen or tone muscles on <3 days
Played on ≥1 sports team	During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)	0 teams, 1 team, 2 teams, or ≥3 teams	Yes (≥1 team) versus no (0 teams)
Attended physical education classes on all 5 days	In an average week when you are in school, on how many days do you go to physical education (PE) classes?	0 days, 1 day, 2 days, 3 days, 4 days, or 5 days	Yes (5 days) versus no (<5 days)
Attended physical education classes on ≥1 day			Yes (≥1 day) versus no (0 day)
Skipped school due to feeling unsafe	During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?	0 days, 1 day, 2 or 3 days, 4 or 5 days, or ≥6 days	Yes (≥ 1 day) versus no (0 days)
Threatened or injured on school property	During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?	0 times, 1 time, 2 or 3 times, 4 or 5 times, 6 or 7 times, 8 or 9 times, 10 or 11 times, or ≥12 times	Yes (≥ 1 time) versus no (0 time)
Witnessed neighborhood violence	Have you ever seen someone get physically attacked, beaten, stabbed, or shot in your neighborhood?	Yes or no	Yes versus no
Bullied at school	During the past 12 months, have you ever been bullied on school property?	Yes or no	Yes versus no
Bullied electronically	During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes or no	Yes versus no

Abbreviation: NA = not applicable.

Results

Physical Activity Behaviors

Overall, approximately half of high school students played on ≥1 sports team (51.9%), exercised to strengthen or tone their muscles on ≥3 days per week (met the muscle-strengthening guideline) (51.1%), and attended physical education classes at least 1 day a week (49.9%) (Table 2). Approximately one fourth of students were physically active for ≥60 minutes per day on all 7 days (met the aerobic guideline) (24.6%), and fewer met both the aerobic and muscle-strengthening guidelines (16.5%). Male students had a higher prevalence of engaging in all physical activity behaviors compared with female students. The prevalence of four physical activity behaviors (met the aerobic guideline, met the muscle-strengthening guideline, met both guidelines, and played on ≥1 sports team) were lower among Asian, Black, and Hispanic students compared with White students. The prevalence of all physical activity behaviors was lower among students in grade 12 compared with students in grade 9, and among lesbian, gay, or bisexual students, and students who are questioning their identity or who identify in some other way compared with heterosexual students.

TABLE 2. Prevalence of high school students who reported physical activity behaviors, by demographic characteristics — Youth Risk Behavior Survey, United States, 2023*

Characteristic	Were physically active for a total of ≥60 minutes per day on all 7 days (met aerobic guideline) % (95% CI)†	Did exercises to strengthen or tone muscles on ≥3 days (met muscle-strengthening guideline) % (95% CI)†	Met both aerobic and muscle-strengthening guidelines % (95% CI)†	Played on ≥1 sports team % (95% CI)†	Went to physical education classes on all 5 days % (95% CI)†	Went to physical education classes on ≥1 day % (95% CI)†
Sex						
Female	16.6 (15.0–18.3)§	37.2 (34.3–40.2)§	9.4 (7.7–11.3)§	48.1 (45.0–51.2)§	23.1 (18.3–28.9)§	44.6 (39.2–50.2)§
Male	32.2 (30.0–34.4)	63.8 (60.7–66.8)	23.5 (20.2–27.1)	55.7 (52.0–59.4)	31.4 (24.9–38.6)	54.7 (49.4–59.8)
Race and ethnicity¶						
American Indian or Alaska Native	31.9 (14.5–56.4)	44.2 (31.2–58.1)	14.3 (9.1–21.9)**	57.0 (44.7–68.4)	34.9 (23.0–49.0)	53.1 (39.9–65.8)
Asian	15.6 (11.6–20.7)††,§§,¶¶,***	45.6 (39.5–51.7)§§,***	9.1 (6.3–12.9)§§,¶¶,***,†††	46.0 (37.5–54.8)§§,***	20.6 (12.8–31.3)§§,†††	53.2 (38.6–67.3)
Black or African American	21.5 (19.3–24.0)§§§,¶¶¶	46.7 (42.5–51.0)***,§§§	12.2 (9.2–16.0)§§§,¶¶¶,****	49.8 (45.7–53.9)§§§,¶¶¶	24.4 (17.2–33.3)	48.1 (39.9–56.3)
Native Hawaiian or other Pacific Islander	29.3 (19.1–42.1)	52.6 (39.1–65.7)	27.3 (17.9–39.1)	56.6 (44.6–67.9)	35.2 (19.8–54.5)	55.7 (38.9–71.3)
White	29.0 (26.7–31.4)	54.3 (49.5–59.0)	19.5 (16.1–23.3)	56.2 (52.0–60.3)	26.2 (20.5–33.0)	48.4 (42.7–54.2)
Hispanic or Latino	20.1 (17.3–23.3)††††,§§§§	48.8 (45.2–52.4)††††	14.4 (11.1–18.4)††††,§§§§,¶¶¶¶	47.3 (43.6–51.0)††††,§§§§	30.9 (23.4–39.7)	51.9 (45.3–58.4)
Multiracial	26.3 (21.6–31.5)	56.2 (49.8–62.5)	20.4 (16.1–25.5)	57.0 (51.2–62.5)	28.9 (20.9–38.6)	50.6 (42.7–58.5)
Grade						
9	26.9 (24.4–29.6)*****	55.3 (51.5–59.1)*****,†††††	17.5 (14.4–20.9)	57.2 (53.1–61.2)*****,†††††	39.5 (30.5–49.3)*****,†††††,§§§§§	71.1 (64.1–77.2)*****,†††††,§§§§§
10	26.4 (23.5–29.6)¶¶¶¶¶	52.1 (47.5–56.6)	18.2 (14.6–22.4)¶¶¶¶¶	54.2 (50.2–58.2)¶¶¶¶¶	30.3 (23.5–38.1)¶¶¶¶¶,******	53.3 (47.1–59.4)¶¶¶¶¶,******
11	23.7 (21.1–26.4)	48.8 (44.0–53.6)	16.2 (13.0–19.9)	50.2 (45.9–54.5)	21.4 (16.2–27.7)††††††	40.2 (33.3–47.6)††††††
12	21.0 (18.3–24.1)	47.9 (44.0–51.7)	14.0 (11.3–17.2)	46.1 (41.1–51.3)	17.1 (12.9–22.3)	33.0 (26.2–40.6)
Sexual identity						
Heterosexual	28.8 (26.9–30.7)§§§§§§,¶¶¶¶¶¶	57.7 (54.5–60.9)§§§§§§,¶¶¶¶¶¶	20.3 (17.4–23.4)§§§§§§,¶¶¶¶¶¶	57.9 (54.5–61.1)§§§§§§,¶¶¶¶¶¶	29.0 (23.0–35.9)§§§§§§,¶¶¶¶¶¶	52.2 (46.5–57.8)§§§§§§,¶¶¶¶¶¶
Lesbian, gay, or bisexual	12.7 (10.7–15.0)	31.7 (27.8–35.9)	6.9 (5.2–9.2)	37.7 (34.1–41.4)	20.9 (16.2–26.5)	41.7 (36.6–47.0)
Described identity in some other way or questioning	12.7 (10.5–15.4)	27.4 (23.5–31.7)	5.5 (3.6–8.3)	34.0 (29.3–39.0)	23.4 (17.7–30.2)	43.8 (37.8–49.9)
Total	**24.6 (22.8–26.5)**	**51.1 (48.0–54.1)**	**16.5 (14.0–19.3)**	**51.9 (48.9–54.9)**	**27.4 (21.9–33.6)**	**49.9 (44.8–55.0)**

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Weighted prevalence and corresponding 95% CI.

§ Female students significantly differed from male students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶ Persons of Hispanic or Latino origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

** American Indian or Alaska Native students significantly differed from Native Hawaiian or other Pacific Islander students, based on *t*-test analysis with Taylor series linearization (p<0.05).

†† Asian students significantly differed from Black or African American or African American students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§ Asian students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶ Asian students significantly differed from Native Hawaiian or other Pacific Islander students, based on *t*-test analysis with Taylor series linearization (p<0.05).

*** Asian students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

††† Asian students significantly differed from Hispanic or Latino students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§ Black or African American students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶ Black or African American students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

**** Black or African American students significantly differed from Native Hawaiian or other Pacific Islander, based on *t*-test analysis with Taylor series linearization (p<0.05).

†††† Hispanic or Latino students significantly differed from multiracial students, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§ Hispanic or Latino students significantly differed from White students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶ Hispanic or Latino students significantly differed from Native Hawaiian or other Pacific Islander students, based on *t*-test analysis with Taylor series linearization (p<0.05).

***** Students in grade 9 significantly differed from students in grade 12, based on *t*-test analysis with Taylor series linearization (p<0.05).

††††† Students in grade 9 significantly differed from students in grade 11, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§ Students in grade 9 significantly differed from students in grade 10, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶ Students in grade 10 significantly differed from students in grade 12, based on *t*-test analysis with Taylor series linearization (p<0.05).

****** Students in grade 10 significantly differed from students in grade 11, based on *t*-test analysis with Taylor series linearization (p<0.05).

†††††† Students in grade 11 significantly differed from students in grade 12, based on *t*-test analysis with Taylor series linearization (p<0.05).

§§§§§§ Heterosexual students significantly differed from lesbian, gay, or bisexual students, based on *t*-test analysis with Taylor series linearization (p<0.05).

¶¶¶¶¶¶ Heterosexual students significantly differed from students who described identity in some other way or were questioning, based on *t*-test with Taylor series linearization (p<0.05).

Physical Activity Behaviors by Negative Safety and Violence Experiences

Overall, students who skipped school due to feeling unsafe had a lower prevalence of meeting the aerobic guideline compared with students who did not skip school (Tables 3 and 4). Students who were bullied electronically had a lower prevalence of meeting the muscle-strengthening guideline and attending physical education class on all 5 days compared with students who were not bullied electronically. Conversely, students who were threatened or injured with a weapon at school had a higher prevalence of meeting the muscle-strengthening guideline and playing on ≥1 sports team compared with students who were not threatened or injured with a weapon at school.

Among male and female students, the prevalence of physical activity behavior differed by negative safety and violence experience. For example, the prevalence of meeting the muscle-strengthening guideline was higher among female students who were threatened or injured with a weapon at school (48.6%) or bullied at school (40.9%) compared with female students without these experiences (36.3% and 36.4%, respectively). Male students who were threatened or injured with a weapon at school had a higher prevalence (71.7%) of meeting the muscle-strengthening guideline compared with male students without this negative experience (63.1%). Male students who were bullied at school had a lower prevalence of meeting the aerobic guideline (27.6%) and male students who were bullied electronically had a lower prevalence of attending physical education class on all 5 days (25.1%) compared with their male peers who did not experience these kinds of bullying (33.1% and 32.3%, respectively).

Associations Between Physical Activity Behaviors and Negative Safety and Violence Experiences by Sex

In adjusted models, among female students, a positive association was observed between being threatened or injured with a weapon at school and meeting the aerobic guideline, meeting the muscle-strengthening guideline, and playing on ≥1 sports teams (Tables 5 and 6). In addition, among female students, there was a positive association between being bullied at school and meeting the aerobic guideline and meeting both aerobic and muscle-strengthening guidelines.

Among male students, there was a positive association between being threatened or injured with a weapon at school and meeting the muscle-strengthening guideline and playing on ≥1 sports team. In addition, among male students, a positive association between witnessing neighborhood violence and meeting the aerobic guideline and meeting the muscle-strengthening guideline was observed.

TABLE 3. Prevalence of physical activity behaviors among high school students, by sex and negative safety and violence experiences — Youth Risk Behavior Survey, United States, 2023*

Negative safety and violence experiences	Were physically active for a total of ≥60 minutes per day on all 7 days (met aerobic guideline)			Did exercises to strengthen or tone muscles on ≥3 days (met muscle-strengthening guideline)			Met both aerobic and muscle-strengthening guidelines		
	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)
Skipped school due to feeling unsafe									
Yes	**20.7 (17.6–24.1)**†	14.8 (11.5–18.9)	29.8 (23.6–36.8)	**48.5 (45.5–51.4)**	38.4 (35.4–41.5)	63.8 (57.5–69.6)	**14.0 (11.1–17.6)**	9.9 (7.3–13.4)	20.6 (14.3–28.7)
No	**25.3 (23.3–27.3)**	16.9 (15.2–18.8)	32.5 (30.3–34.7)	**51.4 (48.1–54.7)**	37.0 (33.7–40.4)	63.8 (60.6–66.9)	**16.9 (14.2–20.0)**	9.3 (7.5–11.4)	23.8 (20.5–27.5)
Threatened or injured with a weapon on school property									
Yes	**26.4 (23.0–30.1)**	20.5 (16.3–25.4)	31.7 (27.9–35.7)	**60.6 (55.7–65.4)**§	48.6 (42.9–54.2)§	71.7 (64.4–78.0)§	**16.5 (13.0–20.7)**	12.2 (8.5–17.0)	20.4 (16.0–25.6)
No	**24.5 (22.5–26.5)**	16.3 (14.5–18.2)	32.2 (29.8–34.6)	**50.1 (46.9–53.4)**	36.3 (33.3–39.3)	63.1 (59.7–66.4)	**16.6 (14.0–19.7)**	9.1 (7.4–11.2)	24.0 (20.5–27.8)
Witnessed neighborhood violence									
Yes	**26.5 (23.1–30.1)**	15.7 (12.9–19.0)	35.0 (30.6–39.7)	**53.5 (49.6–57.3)**	36.1 (31.4–41.0)	67.3 (62.7–71.6)¶	**20.3 (16.8–24.3)**	10.3 (7.7–13.6)	28.4 (23.7–33.5)
No	**25.0 (23.3–26.8)**	17.3 (15.4–19.5)	32.3 (30.1–34.5)	**50.5 (46.8–54.2)**	37.7 (34.2–41.3)	62.6 (58.9–66.2)	**19.1 (17.0–21.4)**	11.3 (9.5–13.3)	26.6 (24.1–29.4)
Bullied at school									
Yes	**23.0 (19.9–26.4)**	19.1 (16.3–22.3)	27.6 (22.7–33.1)**	**50.4 (46.5–54.4)**	40.9 (37.1–44.8)**	62.5 (57.4–67.3)	**16.1 (13.0–19.8)**	12.6 (10.0–15.8)**	20.3 (15.8–25.7)
No	**25.2 (23.3–27.1)**	16.0 (14.1–18.1)	33.1 (31.0–35.3)	**51.4 (48.1–54.6)**	36.4 (33.2–39.7)	64.2 (60.9–67.3)	**16.7 (14.1–19.7)**	8.5 (6.8–10.6)	24.2 (20.8–27.8)
Bullied electronically									
Yes	**22.3 (18.2–27.1)**	18.6 (15.1–22.7)	28.4 (22.1–35.7)	**47.8 (43.5–52.2)**††	40.3 (36.2–44.6)	60.8 (54.1–67.0)	**14.5 (10.8–19.2)**	11.0 (8.2–14.7)	20.1 (14.2–27.6)
No	**25.2 (23.3–27.1)**	16.2 (14.4–18.1)	32.7 (30.6–34.8)	**51.7 (48.6–54.8)**	36.5 (33.3–39.9)	64.2 (61.2–67.2)	**17.0 (14.4–19.8)**	8.9(7.2–11.0)	23.9 (20.8–27.4)

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Students who skipped school due to feeling unsafe significantly different from students who did not skip school, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

§ Students who were threatened or injured with a weapon on school property significantly differed from students who were not threatened or injured with a weapon on school property, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

¶ Students who witnessed neighborhood violence significantly differed from students who did not witness neighborhood violence, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

** Students who were bullied at school significantly differed from students who were not bullied at school, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

†† Students who were bullied electronically significantly differed from students who were not bullied electronically, based on *t*-test analysis with Taylor series linearization ($p<0.05$).

TABLE 4. Prevalence of physical activity behaviors among high school students, by sex and negative safety and violence experiences — Youth Risk Behavior Survey, United States, 2023*

Negative safety and violence experiences	Played on ≥1 sports team			Went to physical education classes on all 5 days			Went to physical education classes on ≥1 day		
	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)	Overall % (95% CI)	Female % (95% CI)	Male % (95% CI)
Skipped school due to feeling unsafe									
Yes	**50.4 (46.5–54.3)**	46.4 (40.7–52.1)	57.2 (49.1–64.9)	**27.4 (21.3–34.5)**	23.4 (18.4–29.3)	34.2 (24.9–44.9)	**50.4 (43.8–57.1)**	45.7 (38.8–52.7)	58.1 (49.2–66.5)
No	**52.3 (49.2–55.3)**	48.6 (45.2–52.0)	55.6 (52.0–59.3)	**27.4 (21.7–33.9)**	23.1 (18.0–29.2)	31.0 (24.5–38.4)	**49.8 (44.7–55.0)**	44.5 (38.9–50.2)	54.2 (49.1–59.3)
Threatened or injured with a weapon on school property									
Yes	**58.2 (54.1–62.3)**†	56.9 (49.9–63.6)†	60.5 (54.1–66.5)	**29.8 (23.4–37.2)**	23.6 (17.4–31.2)	36.0 (27.6–45.4)	**52.3 (47.3–57.2)**	43.6 (36.4–51.0)	59.4 (53.0–65.5)
No	**51.2 (47.9–54.5)**	46.9 (43.3–50.5)	55.4 (51.5–59.3)	**27.6 (22.1–33.9)**	23.4 (18.4–29.3)	31.5 (25.0–38.7)	**50.1 (44.9–55.4)**	45.3 (39.6–51.1)	54.7 (49.3–60.0)
Witnessed neighborhood violence									
Yes	**52.6 (48.2–57.0)**	46.7 (41.7–51.8)	57.4 (51.4–63.1)	**29.9 (24.6–35.8)**	22.0 (16.5–28.7)	36.8 (31.1–42.9)	**52.3 (46.6–57.9)**	44.0 (36.8–51.5)	58.8 (53.0–64.4)
No	**52.2 (48.8–55.6)**	48.5 (45.0–52.1)	56.0 (51.8–60.1)	**29.5 (24.1–35.7)**	26.0 (21.0–31.6)	32.8 (26.1–40.3)	**51.8 (46.0–57.5)**	47.0 (40.7–53.4)	56.3 (50.5–62.0)
Bullied at school									
Yes	**51.8 (48.0–55.6)**	50.6 (46.1–55.2)	53.4 (47.6–59.0)	**26.5 (20.8–33.0)**	23.3 (18.4–29.0)	30.3 (22.7–39.2)	**51.2 (45.8–56.5)**	47.0 (40.9–53.3)	56.0 (49.9–62.0)
No	**52.2 (48.9–55.4)**	47.5 (44.3–50.7)	56.3 (52.3–60.3)	**27.5 (21.8–33.9)**	22.8 (17.6–29.1)	31.5 (25.1–38.7)	**49.3 (44.0–54.7)**	43.6 (37.7–49.7)	54.3 (49.0–59.5)
Bullied electronically									
Yes	**50.8 (46.5–55.1)**	51.5 (46.5–56.6)	50.2 (43.1–57.3)	**22.8 (16.8–30.3)**§	21.6 (16.0–28.5)	25.1 (17.3–34.9)§	**47.8 (42.2–53.4)**	45.8 (39.7–52.0)	50.6 (44.2–56.9)
No	**52.2 (49.0–55.4)**	47.2 (44.1–50.4)	56.6 (52.8–60.3)	**28.3 (22.6–34.8)**	23.6 (18.3–29.8)	32.3 (25.8–39.5)	**50.2 (44.9–55.4)**	44.2 (38.4–50.1)	55.1 (49.8–60.4)

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Students who were threatened or injured with a weapon on school property significantly differed from students who were not threatened or injured with a weapon on school property, based on *t*-test with Taylor series linearization ($p<0.05$).

§ Students who were bullied electronically significantly differed from students who were not bullied electronically, based on *t*-test with Taylor series linearization ($p<0.05$).

TABLE 5. Associations between negative safety and violence experiences and physical activity behaviors among high school students, by sex — Youth Risk Behavior Survey, United States, 2023*

Negative safety and violence experience†	Were physically active for a total of ≥60 minutes per day on all 7 days (met aerobic guideline)				Did exercises to strengthen or tone muscles on ≥3 days (met muscle-strengthening guideline)				Met both aerobic and muscle-strengthening guidelines			
	Female		Male		Female		Male		Female		Male	
	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)
Skipped school due to feeling unsafe	0.88 (0.68–1.14)	0.98 (0.77–1.26)	0.92 (0.74–1.15)	1.04 (0.84–1.28)	1.04 (0.93–1.15)	1.06 (0.96–1.16)	1.00 (0.91–1.10)	1.07 (0.99–1.16)	1.07 (0.76–1.51)	1.19 (0.86–1.65)	0.86 (0.61– 1.22)	1.01 (0.73– 1.41)
Threatened or injured with a weapon on school property	1.26 (0.98–1.62)	1.34 (1.03–1.74)**	0.99 (0.86–1.13)	1.12 (0.97–1.29)	1.34 (1.20–1.49)**	1.28 (1.12–1.45)**	1.14 (1.03–1.25)**	1.17 (1.07–1.28)**	1.33 (0.93–1.91)	1.38 (0.98–1.96)	0.85 (0.70– 1.03)	0.98 (0.82–1.17)
Witnessed neighborhood violence	0.91 (0.73–1.13)	1.00 (0.80–1.26)	1.08 (0.94–1.24)	1.17 (1.02–1.33)**	0.96 (0.81–1.12)	1.01 (0.88–1.16)	1.07 (1.00–1.15)**	1.11 (1.04–1.18)**	0.91 (0.67–1.22)	1.03 (0.76–1.38)	1.07 (0.91– 1.25)	1.15 (0.99–1.34)
Bullied at school	1.19 (0.96–1.47)	1.21 (1.01–1.45)**	0.83 (0.69–1.01)	0.91 (0.78–1.06)	1.12 (1.01–1.25)**	1.09 (0.99–1.20)	0.97 (0.90–1.05)	1.02 (0.93–1.11)	1.48 (1.13– 1.94)**	1.53 (1.22– 1.93)**	0.84 (0.68–1.03)	0.93 (0.78– 1.12)
Bullied electronically	1.15 (0.90–1.47)	1.19 (0.98–1.45)	0.87 (0.68–1.10)	1.02 (0.88–1.19)	1.10 (0.97–1.25)	1.05 (0.93–1.18)	0.95 (0.86–1.04)	0.98 (0.90–1.07)	1.23 (0.90–1.69)	1.28 (0.98– 1.67)	0.84 (0.63–1.11)	1.01 (0.85–1.20)

Abbreviations: aPR = adjusted prevalence ratio; PR = prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Each negative safety experience was included in a separate model with each of the physical activity behaviors, with no other negative safety experiences adjusted for in any model.

§ PR for physical activity behaviors, comparing students with negative safety experiences to those without (referent group).

¶ aPR for physical activity behaviors, adjusted for grade, race and ethnicity, and sexual identity, comparing students with negative safety experiences to those without (referent group).

** Estimates were considered statistically significant if the 95% CIs did not include 1.0. Certain 95% CIs include 1.0 because of rounding.

Negative associations were observed between the negative safety and violence experiences and physical education attendance. In adjusted models, among female students, a negative association was observed between witnessing neighborhood violence and attending physical education classes on all 5 days. In adjusted models, among male students, a negative association was observed between being bullied electronically and attending physical education classes on all 5 days.

Discussion

Although nationwide efforts to promote physical activity among adolescents exist, the findings of this report indicate that >80% of U.S. high school students are not meeting the nationally recommended aerobic and muscle-strengthening guidelines for physical activity. In addition, disparities were observed in meeting guidelines, whereby male students, heterosexual students, and White students were more likely

TABLE 6. Associations between negative safety and violence experiences and physical activity behaviors among high school students, by sex — Youth Risk Behavior Survey, United States, 2023*

Negative safety and violence experience†	Played on ≥1 sports team				Went to physical education classes on all 5 days				Went to physical education classes on ≥1 day			
	Female		Male		Female		Male		Female		Male	
	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶| (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)	PR§ (95% CI)	aPR¶ (95% CI)
Skipped school due to feeling unsafe	0.95 (0.83–1.09)	0.98 (0.84–1.13)	1.03 (0.91–1.17)	1.10 (0.98–1.22)	1.01 (0.82–1.24)	0.99 (0.79–1.24)	1.10 (0.84–1.44)	1.10 (0.84–1.45)	1.03 (0.91–1.16)	1.00 (0.89–1.13)	1.07 (0.95–1.21)	1.06 (0.94–1.19)
Threatened or injured with a weapon on school property	1.21 (1.06–1.39)**	1.22 (1.06–1.40)**	1.09 (0.99–1.20)	1.15 (1.05–1.26)**	1.01 (0.79–1.29)	0.95 (0.75–1.21)	1.14 (0.95–1.38)	1.06 (0.87–1.30)	0.96 (0.82–1.13)	0.89 (0.75–1.05)	1.09 (0.98–1.21)	0.99 (0.89–1.10)
Witnessed neighborhood violence	0.96 (0.86–1.08)	1.04 (0.94–1.16)	1.02 (0.93–1.13)	1.05 (0.96–1.15)	0.85 (0.69–1.04)	0.78 (0.64–0.95)**	1.12 (0.96–1.31)	1.09 (0.96–1.25)	0.94 (0.83–1.05)	0.90 (0.80–1.01)	1.04 (0.97–1.12)	1.05 (0.98–1.12)
Bullied at school	1.07 (0.98–1.17)	1.03 (0.94–1.12)	0.95 (0.85–1.05)	1.01 (0.91–1.12)	1.02 (0.82–1.26)	0.98 (0.80–1.20)	0.96 (0.82–1.13)	0.96 (0.85–1.10)	1.08 (0.96–1.21)	1.01 (0.91–1.12)	1.03 (0.96–1.11)	1.00 (0.94–1.07)
Bullied electronically	1.09 (0.98–1.21)	1.05 (0.95–1.17)	0.89 (0.78–1.01)	0.96 (0.85–1.09)	0.92 (0.70–1.20)	0.93 (0.74–1.16)	0.78 (0.60–1.00)	0.86 (0.76–0.98)**	1.04 (0.93–1.15)	0.98 (0.89–1.09)	0.92 (0.83–1.01)	0.93 (0.86–1.01)

Abbreviations: aPR = adjusted prevalence ratio; PR = prevalence ratio.

* N = 20,103 respondents. The total number of students answering each question varied. Data might be missing because 1) the question did not appear in that student's questionnaire, 2) the student did not answer the question, or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Percentages in each category are calculated on the known data.

† Each negative safety experience was included in a separate model with each of the physical activity behaviors, with no other negative safety experiences adjusted for in any model.

§ PR for physical activity behaviors, comparing students with negative safety experiences to those without (referent group).

¶ aPR for physical activity behaviors, adjusted for grade, race and ethnicity, and sexual identity, comparing students with negative safety experiences to those without (referent group).

** Estimates were considered statistically significant if the 95% CIs did not include 1.0. Some 95% CIs include 1.0 because of rounding.

to meet the physical activity guidelines. This report found, for male and female students, that certain negative safety and violence experiences were associated with a higher prevalence of engagement in physical activity behaviors and that associations varied by sex. In adjusted models, a positive association was observed between being threatened or injured on school property and meeting the muscle-strengthening guideline, among both male and female students. In contrast, being bullied at school was positively associated with meeting the aerobic guideline and meeting both the aerobic and muscle-strengthening guidelines among female but not male students, in adjusted models.

Previous studies have demonstrated the role of physical activity as a protective factor that promotes students' health and well-being (*8*). Daily physical activity (i.e., ≥60 minutes all 7 days), daily physical education (i.e., attended all 5 days), and playing on sports teams have all been associated with higher levels of feeling close to persons at school, which helps students engage in positive health behaviors and avoid many risk behaviors (*8*,*9*). Physical activity also has been identified as a protective factor for adolescents because it positively affects self-esteem, relationships, and academic achievement (*1*,*10*). Therefore, students who experience situations that make them feel unsafe might engage in physical activity as an outlet for coping with increased stress and anxiety (*11*).

Certain results observed in this report differed from those of a similar 2009 study, but both studies found positive and negative relations between violence-related behaviors and physical activity behaviors in high school students (*6*). For example, among male students who were bullied on school property, the 2009 study demonstrated a negative association with daily physical activity, while the results in this report demonstrate a negative association with physical education (*6*). One similar finding in both reports was a positive association among male students threatened or injured with a weapon on school property and sports team participation (*6*). In an analysis of 2019 YRBS data, adolescent girls who experienced sexual violence were found to have engaged in muscle-strengthening exercises more often; one possible reason is that students might turn to strength training as a means of protecting themselves from future acts of violence, as has been noted among anabolic steroid users who have experienced sexual violence (*12*,*13*). Alternatively, muscle-strengthening and playing sports might provide a positive outlet for students who have experienced stressful situations.

Physical activity behaviors that are contingent on school practice and policy (e.g., physical education class attendance), might have a different relation to student-level safety and violence experiences. For example, female students who witnessed community violence and male students who were bullied electronically were less likely to attend physical education class on all 5 days, indicating a different directional relation with these negative safety and violence experiences than the other physical activity behaviors. Future studies are needed to understand how school policy or other factors related to school policy might affect sex-specific associations between negative safety and violence experiences and physical education attendance.

The cross-sectional nature of these data prevents causal inference. For example, although physical activity is known

to help reduce symptoms of anxiety and depression (*1*), it is unclear whether students turn to physical activity as a way of reducing anxiety and depression or if they are exposed to negative safety and violence experiences (e.g., unsafe environments, sports hazing, or rivalries) while participating in physical activity. Being bullied at school was positively associated with meeting the aerobic physical activity guideline and meeting both physical activity guidelines for female students, but not male students. Physical environments related to physical activity might play a role in these relationships; locker rooms, for instance, have been identified as places within school settings associated with violence and bullying, especially for female students (*14*). This finding emphasizes that safe physical environments are important for both promoting physical activity and preventing youth violence (https://www.cdc.gov/violence-prevention/media/pdf/resources-for-action/cv-prevention-resource-for-action_508.pdf) in spaces where physical activity occurs.

Because schools have a unique opportunity to help students participate in the amount of physical activity beneficial for overall health, negative safety and violence experiences associated with students' physical activity behaviors need to be carefully considered. Understanding female and male students' current physical activity behaviors in the context of negative safety and violence experiences could be important for physical education teachers, coaches, athletic directors, and school counselors. For example, there could be an opportunity within physical education classes, sports teams, and school spaces that promote physical activity to discuss ways to constructively process stress that students face when they feel unsafe. The identified associations between negative safety and violence experiences and more frequent physical activity behaviors also reinforce the need for physical activity infrastructure and programming in the school setting as a protective factor for the well-being of children and adolescents (*2*).

These findings demonstrate that more high school students who have been threatened at school played on a youth sports team than students without these negative experiences. As schools and communities work to increase the proportion of children and adolescents who participate on a sports team or take sports lessons after school or on weekends (an objective of Healthy People 2030; https://health.gov/healthypeople), students could substantially benefit from ensuring that sports offer a healthy and safe environment and outlet for coping with stress. These considerations can help keep participation safe for students while increasing opportunities for school-based physical activity that are implemented as part of a Comprehensive School Physical Activity Program.

Limitations

General limitations for the 2023 YRBS are described in the overview report of this supplement (*7*). The findings in this report are subject to at least two additional limitations. First, negative safety and violence experiences and physical activity behaviors had various frames of reference (i.e., past 7 days, past 30 days, and past year), which might affect any resulting relation between the experiences and the physical activity behaviors. Second, individual socioeconomic status measures are known to be associated with physical activity opportunities but were not available and thus not accounted for in the analyses (*15*).

Future Directions

Continuing to monitor trends in physical activity behaviors to promote health and well-being could be beneficial to students. Future studies could link YRBS data to school and place-based data sets to determine school and community characteristics that might act as barriers or facilitators to creating safe environments and encouraging physical activity behaviors. Linking these data sets would allow for investigating how physical activity behaviors differ by other demographic and socioeconomic characteristics to further examine health disparities. This findings in this report also suggest the need for further research to explore causal relations between negative safety and violence experiences and physical activity behaviors, identify pathways to understand how violence increases stress, and investigate whether physical activity serves as a moderator when students feel unsafe. Future studies could use multivariable modeling to consider the association between multiple negative safety and violence experiences with a single physical activity behavior, which could help identify the most salient negative experience related to engaging in a physical activity behavior. Future surveys could also consider asking students directly whether negative safety and violence experiences motivated them to participate in more or less of a specific physical activity behavior. In addition, it would be beneficial to examine the differences between physical activity behaviors that students engage in on school grounds compared with those that occur in nonschool settings. Whether female students and male students might be subject to negative safety and violence experiences for reasons related to gender norms and physical activity is unknown. These experiences might include female students being bullied for having a muscular physique from muscle-strengthening or male students being bullied electronically for being unathletic and not attending physical education classes. These findings might also guide professional development opportunities to ensure coaches,

physical education teachers, and athletic directors have access to knowledge, tools, and resources related to identifying and supporting students who have experienced violence or bullying while also creating safe, supportive environments for physical activity.

Conclusion

Although physical activity is a protective factor and beneficial to health and well-being, fewer than one in five students met both the aerobic and muscle-strengthening guidelines. In addition, only half of students participated in physical education and sports, which are opportunities that increase their physical activity. Contrary to what was expected, negative safety and violence experiences were mostly associated with students being more likely to engage in physical activity behaviors, with the exception of physical education class attendance. Understanding the potential protective effect of physical activity behaviors and the physical activity environments and situations in which students might encounter negative safety and violence experiences can inform physical activity infrastructure and programming offered in a school setting. Further exploring these associations can help public health and educational leaders develop more effective school-based interventions as well as continue to build practices that promote physical activity in schools through a Comprehensive School Physical Activity Program. In practice, this study could serve as a reference point for initiating dialogue about ways of ensuring implementation of safe, supportive, and inclusive school and physical activity environments that address bullying and violence. Physical education teachers can play a critical role for supporting physical activity participation within schools and creating safe environments for physical activity while addressing the development of skills across the psychomotor, cognitive, social, and affective domains of learning throughout a student's journey towards developing foundational motivation and self-efficacy for lifelong physical activity.

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Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Sarah Sliwa reported being a part-time adjunct faculty member at Tufts University Friedman School of Nutrition Science and Policy and being an unpaid advisory board member for Concrete Jungle, a nonprofit organization based in Atlanta, Georgia. No other potential conflicts of interest were disclosed.

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