National Health Statistics Reports

Number 191 ■ October 24, 2023

Emergency Department Visits Related to Mental Health Disorders Among Children and Adolescents: United States, 2018–2021

by Loredana Santo, M.D., M.P.H, Zachary J. Peters, M.P.H, Danielle Davis, M.P.H., and Carol J. DeFrances, Ph.D.

Abstract

Objective—This report describes emergency department (ED) visits related to mental health disorders among children and adolescents and compares them with visits by children and adolescents without mental health disorders.

Methods—Nationally representative estimates were derived from data collected in the 2018–2021 National Hospital Ambulatory Medical Care Survey (NHAMCS), an annual survey of ED visits in the United States. ED visits were counted as mental health-related if they had an *International Classification of Diseases, 10th Revision, Clinical Modification* diagnosis code between F01 and F99. Selected characteristics of patients, hospitals, and visits were assessed.

Results—From 2018 to 2021, an annual average of 1,026,000 visits were made by children and adolescents with a diagnosis of a mental health disorder, representing 14.0 ED visits per 1,000 children and adolescents. Visit rates related to mental health disorders were higher among adolescents ages 12–17 (30.7) compared with children younger than 12 years (5.3), among girls (16.1) compared with boys (12.1), and among Black non-Hispanic (20.8) compared with Hispanic (13.2) children and adolescents. Mood disorders, anxiety disorders, and behavioral and emotional disorders were the most frequent diagnoses at mental health-related ED visits. Medicaid was the primary expected source of payment at 60.2% of the visits. Approximately one-quarter of the children and adolescents visiting the ED with any diagnosis of a mental health disorder received at least one psychiatric medication.

Conclusion—Findings from this report describe ED visits related to mental health disorders among children and adolescents and highlight differences in visits to the ED by children and adolescents with and without diagnosed mental health disorders.

Keywords: mental illness • emergency care • children and adolescents • National Hospital Ambulatory Medical Care Survey (NHAMCS)

Introduction

Mental health disorders, including suicide attempts and suicides, have increased in the past decade (1,2). Before the COVID-19 pandemic, approximately one in five children and adolescents had a mental health disorder, on average, each year (3). The number of pediatric emergency department (ED) visits involving mental health concerns also increased over past decades relative to general ED visits (4–8). Data from the 2015–2020 Pediatric Health Information System, an administrative database that contains data from 49 tertiary care U.S. children's hospitals, showed that mental health ED visits increased by 8.0% annually, while all other visits increased by 1.5% annually (9). Data from the 2007–2016 Nationwide Emergency Department Sample showed that pediatric visits for mental health disorders increased 60% during the decade (2). Data from the 2011–2015 National Hospital Ambulatory Medical Care Survey (NHAMCS) reported a 53% increase in psychiatric ED visits among children (ages 6–11 years) and a 54% increase among adolescents (ages 12–17) (1). A recent journal article using 2011–2020 NHAMCS data showed that the percentages of mental health-related

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

NCHS reports can be downloaded from: https://www.cdc.gov/nchs/products/index.htm.

visits for youth ages 6–24 increased from 7.7% of total pediatric ED visits in 2010–2011 to 13.1% of total pediatric ED visits in 2019–2020, with an average annual percent change of 8.0% (8). From March 2020 to October 2020, mental health-related ED visits increased 24% for children ages 5–11 and 31% for those ages 12–17 compared with 2019 ED visits (10).

The decreasing number of psychiatric care facilities nationwide and the inaccessibility of outpatient services, especially during the early COVID-19 pandemic, has made the ED the first point of contact for immediate mental health services for many children and adolescents (11,12).

Recently, the American Academy of Pediatrics, American Academy of Child and Adolescent Psychiatry, and Children's Hospital Association declared a National State of Emergency in Children's Mental Health based on increasing mental health problems among children and adolescents, which were made worse by the COVID-19 pandemic (13). This report adds to previous research (8,10) by using nationally representative data to assess recent ED use and characteristics of visits for mental health disorders by children and adolescents. Unlike other reports (1,8), this report includes analysis on children younger than age 6 and highlights differences among visits by children and adolescents with and without mental health disorders. Data from the 2018–2021 NHAMCS are used to compare patient, hospital, and visit characteristics.

Methods

Data source

NHAMCS is a nationally representative survey of nonfederal general and short-stay hospitals conducted by the National Center for Health Statistics. NHAMCS uses a multistage probability design with samples of geographic primary sampling units, hospitals within primary sampling units, and patient visits within EDs. The plan and operation of NHAMCS are described elsewhere (14). Weighted overall response rates for NHAMCS were 60.3% in 2018, 59.4% in 2019, 35.1% in 2020, and 46.0% in 2021. ED visit data include patient demographic characteristics and visit information obtained from medical records, including medical diagnoses, primary expected source of payment, reason for visit, diagnostic and therapeutic services ordered or provided, and medications given in the ED or prescribed at discharge.

For this report, analyses were conducted using data from a restricted-use version of the data file. A public-use version of this file is available from: https://www.cdc.gov/nchs/ahcd/datasets_documentation_related.htm. Count estimates and measures of variance could differ between the restricted-use and public-use files. Information for accessing the restricted-use data file is available from: https://www.cdc.gov/rdc/index.htm. ED visits were assessed among children and adolescents age 17 and younger. Mental health-related ED visits were identified as having any *International Classification of Diseases, 10th Revision, Clinical Modification* diagnosis code between F01 and F99; NHAMCS includes up to five diagnoses per ED visit. A mental health-related visit could include any one of the five diagnoses collected. Additionally, analyses also assessed subcategories of mental health-related ED visits, with the following categories identified as having any of the associated diagnosis codes:

- Mental and behavioral disorders due to psychoactive substance use (subsequently, substance use disorders): F10–F19
- Mood [affective] disorders: F30–F39
- Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (subsequently, anxiety disorders): F40–F48
- Pervasive and specific developmental disorders (subsequently, developmental disorders): F80–F89
- Behavioral and emotional disorders with onset usually occurring in childhood and adolescence (subsequently, behavioral and emotional disorders): F90–F98
- Other mental health disorders: F01–F09, F20–F29, F50–F59, F60–F69, F70–F79, F99

During 2018–2021, 726 visit records, representing an annual average of approximately 1 million visits, were identified with the associated diagnosis codes. Visit rates represent the number of visits per 1,000 children and adolescents per year from 2018 to 2021 and were based on the July 1, 2018; July 1, 2019; July 1, 2020; and July 1, 2021, sets of estimates of the U.S. civilian noninstitutionalized population, as developed by the U.S. Census Bureau, Population Division. Because of concerns that 2020 was potentially different from the other years due to the COVID-19 pandemic, rate estimates from the 2020 survey year were compared with rate estimates from the other years, and no statistically significant differences were found (see Table I in Technical Notes).

To provide national estimates of ED use, sample weights were applied to each case. Adjustment factors for hospital nonresponse and the inclusion of hospital panels each year are included in the construction of the weights. Sampling error was estimated using a Taylor Series approximation, which accounted for the survey's complex sampling design. The study population for the main analyses includes all ED visits by children and adolescents age 17 and younger. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, N.C.) and SAS callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.). Differences between groups were tested using a two-sided t statistic at the $p < 0.05$ significance level. All estimates were evaluated using National Center for Health Statistics data presentation standards for proportions (15). Estimates that did not meet these standards are presented with an asterisk in the report tables.

Results

Rates of mental health-related ED visits by children and adolescents

During 2018–2021, an annual average of 1,026,000 visits were made by children and adolescents with a diagnosis of a mental health disorder (3.5% of all ED visits by children and adolescents). The ED visit rate was 14.0 per 1,000 children and adolescents (Figure 1).

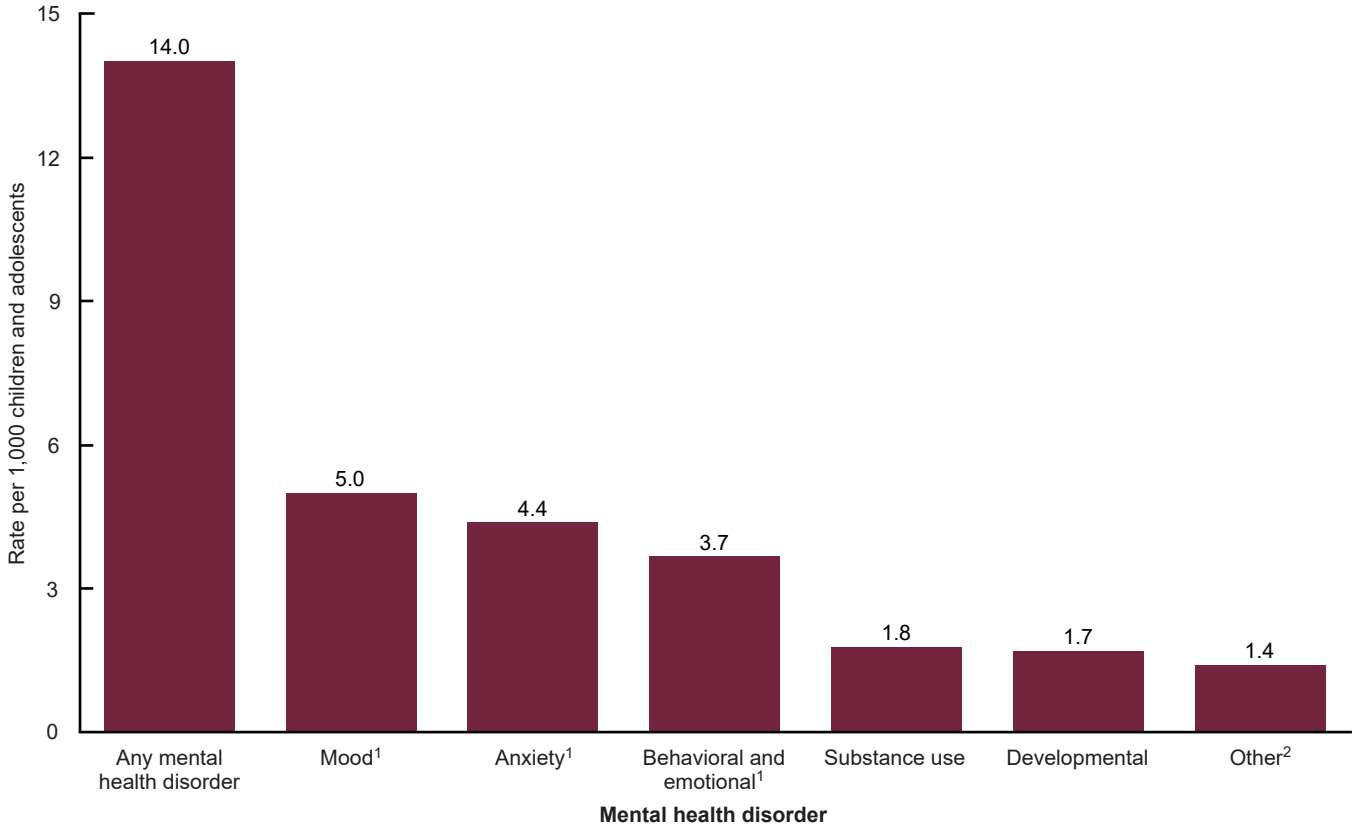
Mood disorders were diagnosed at 5.0 ED visits per 1,000 children and adolescents, followed by anxiety disorders (4.4), behavioral and emotional disorders (3.7), substance use disorders (1.8), and developmental disorders (1.7) (Table 1).

Rates of ED visits among children and adolescents by mental health status and demographic characteristics

Visit rates related to mental health disorders were higher among adolescents ages 12–17 (30.7) compared with children younger than 12 (5.3) (Figure 2). This differed from visits by children and adolescents without mental health disorders, in which visit rates were higher among children younger than 12 (434.8) compared with adolescents ages 12–17 (281.9). ED visit rates related to mental health disorders were higher among girls (16.1) than boys (12.1); however, no difference was observed between boys and girls for nonmental health-related ED visits. ED visit rates related to mental health disorders were higher among Black non-Hispanic (subsequently, Black) children and adolescents (20.8) than Hispanic (13.2) and White non-Hispanic (subsequently, White) (14.4) children and adolescents, but the difference between Black and White children and adolescents was not significant.

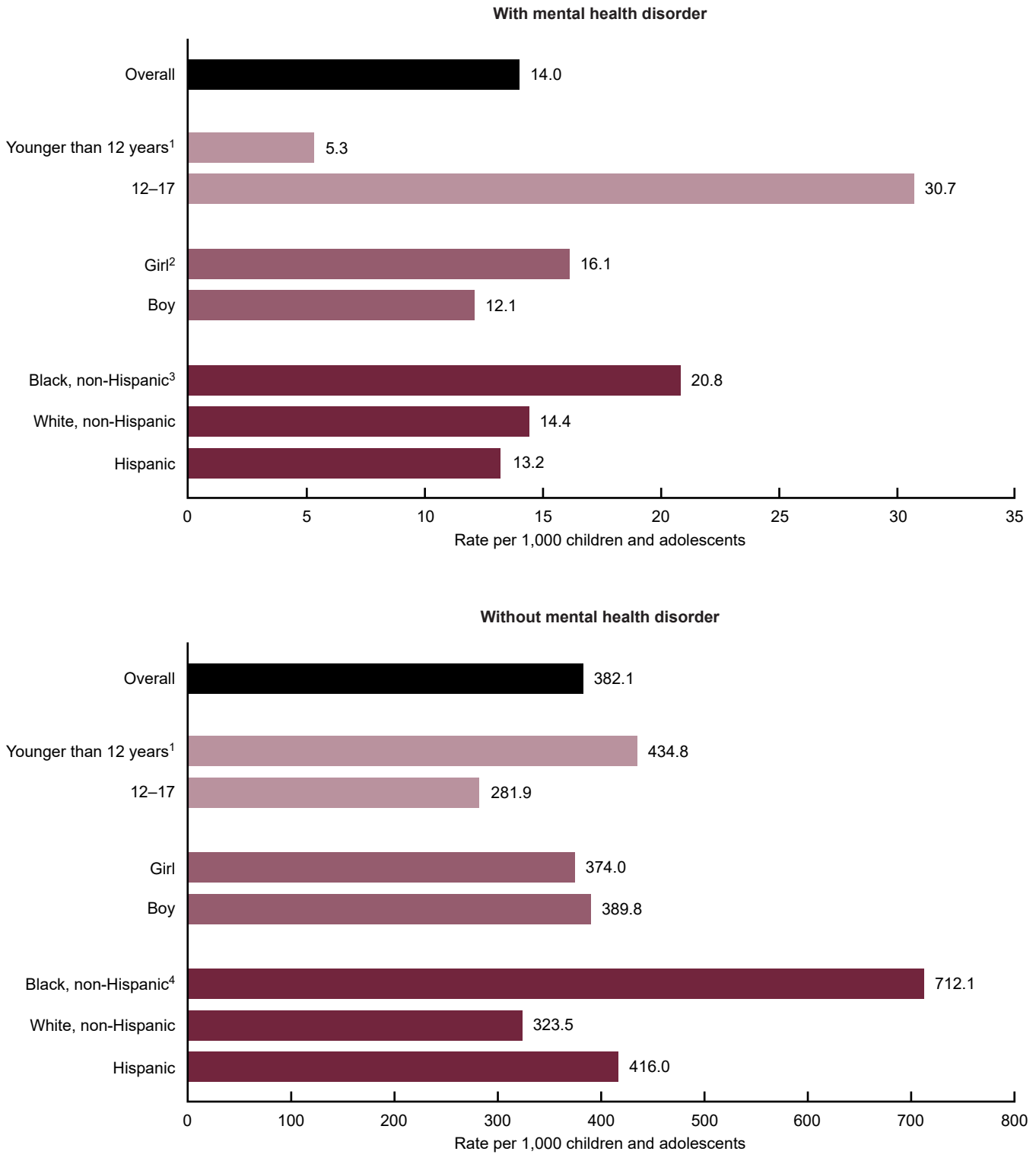
Among visits without mental health disorders, patterns by race and Hispanic origin were similar to ED visit rates for mental health disorders, with higher rates among Black children and adolescents (712.1) than among White (323.5) and Hispanic (416.0) children and adolescents.

Figure 1. Rate of emergency department visits among children and adolescents with a mental health disorder, by type of disorder: United States, 2018–2021



[1]Significantly different from substance use, developmental, and other disorders.
[2]Includes mental disorders due to known physiological conditions; schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders; behavioral syndromes associated with physiological disturbances and physical factors; disorders of adult personality and behavior; intellectual disabilities; and mental disorder, not otherwise specified.
NOTES: Rates are based on a sample of 726 emergency department visits by children and adolescents with any diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents). A visit may be represented in more than one mental health disorder category. *International Classification of Diseases, 10th Revision, Clinical Modification* codes and category descriptions are shown in Table 1 in this report. Visit rates are based on the July 1, 2018; July 1, 2019; July 1, 2020; and July 1, 2021, sets of estimates of the U.S. civilian noninstitutionalized population developed by the U.S. Census Bureau, Population Division.
SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Figure 2. Rate of emergency department visits among children and adolescents, by mental health status and demographic characteristics: United States, 2018–2021



[1]Significantly different from adolescents ages 12–17.
[2]Significantly different from boys.
[3]Significantly different from Hispanic children and adolescents.
[4]Significantly different from Hispanic and White non-Hispanic children and adolescents.
NOTES: Rates for children and adolescents with mental health disorders were lower than rates for those without mental health disorders across all categories. Rates are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits. Visit rates are based on the July 1, 2018; July 1, 2019; July 1, 2020; and July 1, 2021, sets of estimates of the U.S. civilian noninstitutionalized population developed by the U.S. Census Bureau, Population Division. Overall estimates include all visits by children and adolescents age 17 and younger. Race categories for Asian, Native Hawaiian or Other Pacific Islander, American Indian and Alaska Native, and multiple races are not shown due to small sample sizes.
SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Percentages of ED visits among children and adolescents by mental health status and visit and hospital characteristics

Tables 2–4 show percentages of ED visits by selected visit and hospital characteristics. Data are shown for children and adolescents with and without mental health disorders.

Visit characteristics

Medicaid was the most common primary expected source of payment for visits by children and adolescents with mental health disorders, at 60.2%, similar to visits by children and adolescents without mental health disorders, at 67.5% (Table 2). Visits with private insurance represented 35.3% of visits by children and adolescents with mental health disorders, higher than the 26.3% of visits without mental health disorders.

Approximately one in five visits by patients with mental health disorders were either admitted to the hospital or transferred to a psychiatric hospital. Patients were admitted to the hospital at 9.2% of mental health-related ED visits, higher than the 4.7% of visits without mental health disorders. Children and adolescents with mental health disorders were transferred to a psychiatric hospital at 12.4% of the visits, higher than the percentage of visits by patients without mental health disorders, at 0.3%.

Patients waited to be seen for 1 hour or more at 15.1% of all mental health-related ED visits and at 15.5% of visits without mental health disorders. A larger percentage of visits by patients with mental health disorders (42.0%) than visits by patients without mental health disorders (17.8%) lasted 4 hours or more.

"Symptoms referable to psychological and mental disorders or mental disorders" was the principal reason listed for the visit at 31.4% of visits by children and adolescents with a mental health disorder (Table 3). "Symptoms referable to other organs or systems," which includes symptoms referable to the cardiovascular and lymphatic systems; eyes and ears; respiratory system; digestive system; genitourinary; skin, nails, and hair; and musculoskeletal system, was the principal reason for the visit at 20.3% of visits for children and adolescents with mental health-related disorders. Following this, "injuries, poisoning or adverse effect" was reported most frequently at 18.0% of visits. Suicide attempt, self-mutilation, violence, and overdose accounted for approximately one-half of the visits where injuries, poisoning or adverse effect was the principal reason for the visit (Table II). "General or special examinations, diagnostic tests, or medications" (includes general psychiatric or psychological examination) was the principal reason for the visit at 13.3% of mental health-related ED visits (Table 3).

The most frequent reason for visits among children and adolescents without mental health disorders was symptoms referable to other organs or systems (50.1%), followed by injuries, poisoning or adverse effect (19.7%), and general symptoms (18.8%) (Table 3). Suicide attempt, self-mutilation, violence, and overdose accounted for 1.7% of the visits at which injuries, poisoning or adverse effect was the principal reason for the visit (Table II).

Hospital characteristics

Among visits with mental health disorders, the percentage of visits that occurred in hospitals located in the South (33.7%) was higher than the percentages of visits that occurred in hospitals located in the Northeast (21.6%) and West (18.5%) (Table 4). Similarly, among visits without mental health disorders, a higher percentage of visits occurred at hospitals located in the South (42.8%) compared with the other regions. Most ED visits with mental health disorders (90.1%) and without (89.7%) occurred at hospitals in metropolitan statistical areas.

Percentages of ED visits among children and adolescents by mental health status and medication category

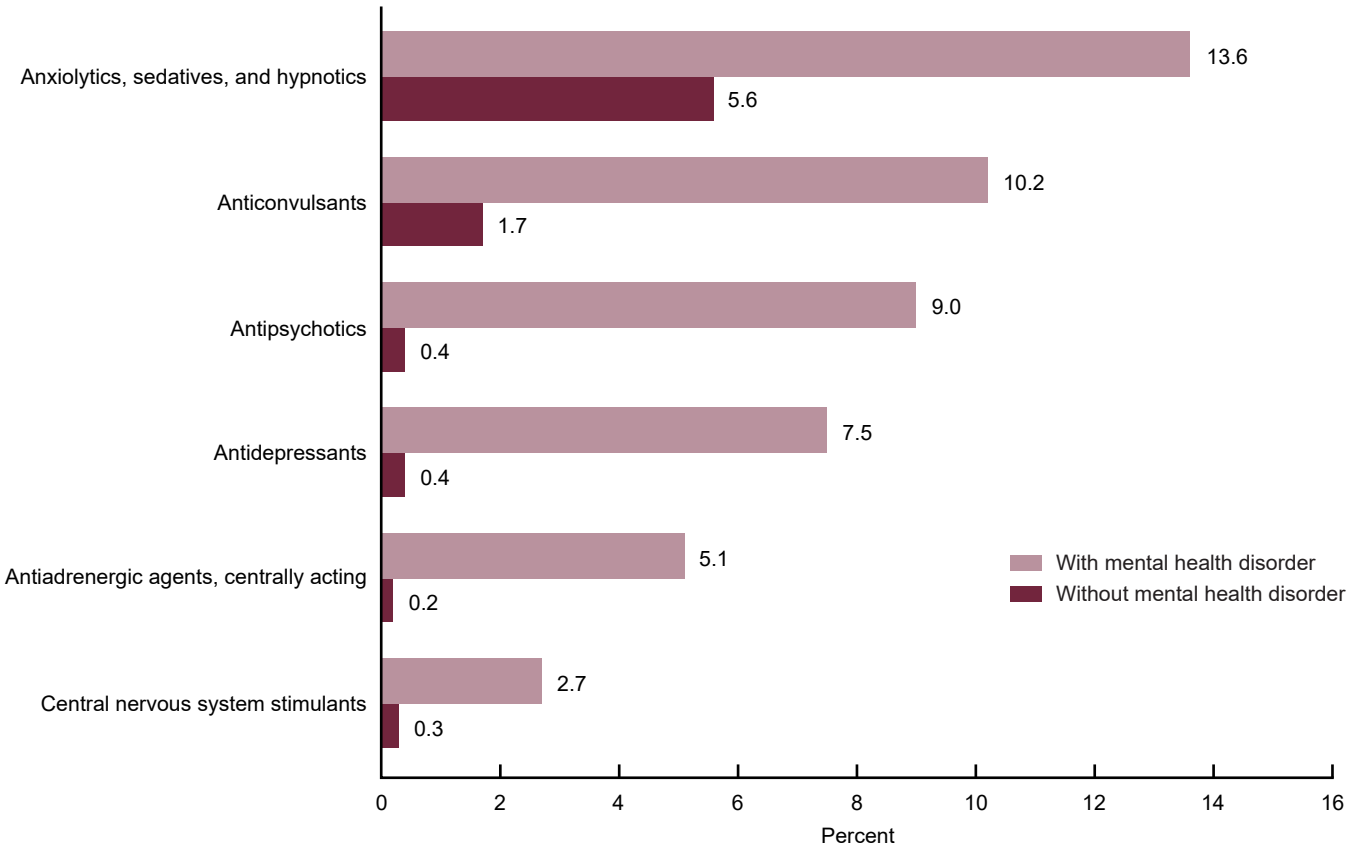
At least one psychiatric medication was given or prescribed at discharge at 24.4% of visits by children and adolescents with mental health disorders (Table 5). Anxiolytics, sedatives, and hypnotics were prescribed at 13.6% of the ED visits by children and adolescents with mental health disorders, followed by anticonvulsants (10.2%), antipsychotics (9.0%), antidepressants (7.5%), antiadrenergic agents (5.1%), and central nervous system stimulants (2.7%) (Figure 3). The percentages of all medication categories given or prescribed were higher for visits by children and adolescents with mental health disorders compared with visits without mental health disorders.

Discussion

Nationally representative data from NHAMCS highlight differences in the use of EDs by children and adolescents with and without mental health disorders. During 2018–2021, ED visit rates for mood disorders, anxiety disorders, and behavioral and emotional disorders were higher than visit rates for the other mental health disorders assessed. This finding is consistent with data showing that anxiety, depression, attention-deficit/hyperactivity disorder, and behavioral disorders are the most common mental health disorders in children and adolescents (3). During 2013–2019, the most common disorders diagnosed in U.S. children and adolescents ages 3–17 years were attention-deficit/hyperactivity disorder, included in this analysis under behavioral and emotional disorders, and anxiety, each affecting approximately 1 in 11 children (3). Data from the 2016 National Survey of Children's Health found that in children ages 3–17 years, 7.1% had anxiety problems, 7.4% had a behavioral or conduct problem, and 3.2% had depression (16).

Rates of mental health-related ED visits were higher among adolescents than children. This could be explained

Figure 3. Percentage of emergency department visits among children and adolescents, by mental health status and medication category: United States, 2018–2021



NOTES: Percentages for visits by children and adolescents with mental health disorders are significantly different from visits by those without mental disorders for all medication categories. Percentages are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits. Medications were identified using the Cerner Multum second-level therapeutic category codes for anxiolytics, sedatives, and hypnotics (67); anticonvulsants (64); antipsychotics (251); antidepressants (249); antiadrenergic agents, centrally acting (44); and CNS stimulants (71), available from: https://www.cerner.com/solutions/drug-database.
SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

by the fact that the most common mental health disorders have higher incidence during adolescence. And while some disorders (for example, depression) typically develop during adolescence, others (for example, attention-deficit/hyperactivity disorder) may have an earlier onset but may remain undiagnosed due to limitations in screening and assessment (17,18). Unlike mental health-related ED visits, rates of nonmental health-related ED visits were higher among children than adolescents, matching the overall pattern of ED visits (20).

Rates for mental health-related ED visits were higher among girls than boys. This is consistent with previous findings from the Centers for Disease Control and Prevention's National Syndromic Surveillance Program showing that during 2019 and 2020, among patients of all ages, the proportion of mental health-related ED visits were higher among females than males (10).

Rates for mental health-related ED visits were higher among Black children and adolescents than Hispanic and White children and adolescents, although the sample lacked power (ability) to detect a significant difference between Black and White children and adolescents. This aligns with previous research (19) and is consistent with higher overall rates of ED visits among Black people (20).

Data from the 2005–2015 NHAMCS showed that a higher proportion of mental health visits resulted in admission or transfer compared with visits without mental health disorders, which is similar to the findings in this report (21). The wait time to be seen by a professional was similar among visits by children and adolescents with and without mental health disorders, while the total length of the visit was higher among visits by children and adolescents with mental health disorders. Previous studies have noted that mental health patients visiting the ED tend to spend more time there for evaluation and disposition due to insufficient psychiatric services and inpatient resources (22,23).

Distributions by region and metropolitan statistical area status for mental health-related ED visits were similar to nonmental health-related visits and similar to the distributions of overall ED visits (20,24–26). In nearly one-third of the mental health-related ED visits, the reason for visit provided by the patient was characterized as symptoms referable to psychological and mental disorders or for mental disorder. Injuries, poisoning or adverse effect was the primary reason for visits at 18.0% of mental health-

related ED visits. A similar percentage of visits reporting injuries, poisoning or adverse effect as the primary reason for the visit was found for nonmental health-related visits. However, a more detailed investigation of the verbatim text available in the NHAMCS data revealed that among these visits, suicide attempt, self-mutilation, violence, and overdose accounted for 49.9% of the injury visits by children and adolescents with mental health disorders and 1.7% of injury visits by children and adolescents without mental health disorders. This aligns with previous reports. Between 2011 and 2015, suicide-related ED visits increased by 250% among children and adolescents (1), and visits related to self-harm increased by 329% between 2007 and 2016 (2). More recent data from the national Youth Risk Behavior Survey indicated that in 2019 among U.S. high school students ages 14–18, 18.8% seriously considered attempting suicide, 15.7% made a suicide plan, 8.9% attempted suicide one or more times, and 2.5% made a suicide attempt requiring medical treatment (3).

At nearly 25% of mental health-related ED visits, at least one psychiatric medication was given or prescribed at discharge. Psychiatric medications may be an effective part of the treatment for mental health disorders in childhood and adolescence and are often used in combination with other treatments (27). A study at an academic medical center that examined pediatric ED visits involving a mental health diagnosis between 2009 and 2013 found that 23% of patients received a pharmacological intervention (7). Anxiolytics, sedatives, hypnotic medications (includes benzodiazepines, barbiturates, and miscellaneous anxiolytics), anticonvulsants (includes benzodiazepine anticonvulsants, among others), and antipsychotics were the three most frequently given or prescribed medication categories for children and youth with mental health-related visits. A retrospective analysis of electronic medical record review of patients visiting a tertiary care pediatric hospital from 2009 to 2016 with a psychiatric chief complaint found that most patients were treated with antipsychotic medications (28). Additionally, a national sample of children covered by private health insurance for at least 1 year between 2012 and 2018 showed that nearly 28% of children received a drug treatment, and benzodiazepines or tricyclic antidepressants were among the most commonly prescribed medications (29).

This study has limitations that should be considered. First, although 4 years of data were combined to increase the reliability of estimates by patient, visit, and hospital characteristics, sample sizes from the 2018–2021 NHAMCS were insufficient to conduct a stratified analysis within age groups. Additionally, estimates for some characteristics (insurance type) did not meet reliability criteria based on small sample size. Also, the small sample size resulted in the inability to detect significant differences for some groups that had relatively large observed differences. Second, this study included visits with any mental health diagnosis listed, even if a mental health disorder was not the primary diagnosis or reason for visiting the ED. Third, NHAMCS does not collect information on whether medications prescribed were taken by the patient; as a result, medication adherence was not examined in this report.

Even with these limitations, this study builds on previous literature, providing the most recent nationally representative data on the pattern of ED use among children and adolescents with mental health disorders.

References

1. Kalb LG, Stapp EK, Ballard ED, Holingue C, Keefer A, Riley A. Trends in psychiatric emergency department visits among youth and young adults in the US. Pediatrics 143(4). 2019.
2. Lo CB, Bridge JA, Shi J, Ludwig L, Stanley RM. Children's mental health emergency department visits: 2007–2016. Pediatrics 145(6). 2020.
3. Bitsko RH, Claussen AH, Lichstein J, Black LI, Jones SE, Danielson ML, et al. Mental health surveillance among children—United States, 2013–2019. MMWR Suppl 71(2):1–42. 2022.
4. Simon AE, Schoendorf KC. Emergency department visits for mental health conditions among US children, 2001–2011. Clin Pediatr (Phila) 53(14):1359–66. 2014.
5. Mapelli E, Black T, Doan Q. Trends in pediatric emergency department utilization for mental health-related visits. J Pediatr 167(4):905–10. 2015.
6. Centers for Disease Control and Prevention. Emergency department visits by patients with mental health disorders—North Carolina, 2008–2010. MMWR Morb Mortal Wkly Rep 62(23):469–72. 2013.
7. Sheridan DC, Spiro DM, Fu R, Johnson KP, Sheridan JS, Oue AA, et al. Mental health utilization in a pediatric emergency department. Pediatr Emerg Care 31(8):555–9. 2015.
8. Bommersbach TJ, McKean AJ, Olfson M, Rhee TG. National trends in mental health-related emergency department visits among youth, 2011–2020. JAMA 329(17):1469–77. 2023.
9. Cushing AM, Liberman DB, Pham PK, Michelson KA, Festekjian A, Chang TP, Chaudhari PP. Mental health revisits at US pediatric emergency departments. JAMA Pediatr 177(2):168–76. 2023.
10. Leeb RT, Bitsko RH, Radhakrishnan L, Martinez P, Njai R, Holland KM. Mental health-related emergency department visits among children aged < 18 years during the COVID-19 Pandemic—United States, January 1–October 17, 2020. MMWR Morb Mortal Wkly Rep 69(45):1675–80. 2020.
11. Cree RA, So M, Franks J, Richards R, Leeb R, Hashikawa A, et al. Characteristics associated with presence of pediatric mental health care policies in emergency departments. Pediatr Emerg Care 37(12):e1116–21. 2021.
12. Cama S, Malowney M, Smith AJB, Spottswood M, Cheng E, Ostrowsky L, et al. Availability of outpatient mental health care by pediatricians and child psychiatrists in five U.S. cities. Int J Health Serv 47(4):621–35. 2017.

13. American Academy of Pediatrics. AAP, AACAP, CHA declare national emergency in children's mental health. 2021.
14. National Center for Health Statistics. 2020 NHAMCS micro-data file documentation. 2022. Available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc20-ed-508.pdf.
15. Parker JD, Talih M, Malec DJ, Beresovsky V, Carroll M, Gonzalez JF Jr, et al. National Center for Health Statistics data presentation standards for proportions. National Center for Health Statistics. Vital Health Stat 2(175). 2017.
16. Ghandour RM, Sherman LJ, Vladutiu CJ, Ali MM, Lynch SE, Bitsko RH, Blumberg SJ. Prevalence and treatment of depression, anxiety, and conduct problems in US Children. J Pediatr 206:256–67. 2019.
17. Kessler RC, Wang PS. The descriptive epidemiology of commonly occurring mental disorders in the United States. Annu Rev Public Health 29:115–29. 2008.
18. Paus T, Keshavan M, Giedd JN. Why do many psychiatric disorders emerge during adolescence? Nat Rev Neurosci 9(12):947–57. 2008.
19. Abrams AH, Badolato GM, Boyle MD, McCarter R, Goyal MK. Racial and ethnic disparities in pediatric mental health-related emergency department visits. Pediatr Emerg Care 38(1):e214–8. 2022.
20. Cairns C, Kang K. National Hospital Ambulatory Medical Care Survey: 2020 emergency department summary tables. DOI: https://dx.doi.org/10.15620/cdc:121911.
21. Nash KA, Zima BT, Rothenberg C, Hoffmann J, Moreno C, Rosenthal MS, Venkatesh AK. Prolonged emergency department length of stay for US pediatric mental health visits (2005–2015). Pediatrics 147(5). 2021.
22. Case SD, Case BG, Olfson M, Linakis JG, Laska EM. Length of stay of pediatric mental health emergency department visits in the United States. J Am Acad Child Adolesc Psychiatry 50(11):1110–9. 2011.
23. Waseem M, Prasankumar R, Pagan K, Leber M. A retrospective look at length of stay for pediatric psychiatric patients in an urban emergency department. Pediatr Emerg Care 27(3):170–3. 2011.
24. Cairns C, Kang K. National Hospital Ambulatory Medical Care Survey: 2019 emergency department summary tables. DOI: https://dx.doi.org/10.15620/cdc:115748.
25. Cairns C, Kang K, Santo L. National Hospital Ambulatory Medical Care Survey: 2018 emergency department summary tables. Available from: https://www.cdc.gov/nchs/data/nhamcs/web_tables/2018-ed-web-tables-508.pdf.
26. Cairns C, Kang K. National Hospital Ambulatory Medical Care Survey: 2021 emergency department summary tables. Available from: https://www.cdc.gov/nchs/data/nhamcs/web_tables/2021-nhamcs-ed-web-tables-508.pdf.
27. American Academy of Child and Adolescent Psychiatry. Psychiatric medication for children and adolescents: Part II—types of medications. 2017. Available from: https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Psychiatric-Medication-For-Children-And-Adolescents-Part-II-Types-Of-Medications-029.aspx.
28. Rudolf F, Hollenbach K, Carstairs KL, Carstairs SD. A retrospective review of antipsychotic medications administered to psychiatric patients in a tertiary care pediatric emergency department. J Pediatr Pharmacol Ther 24(3):234–7. 2019.
29. Cuddy E, Currie J. Treatment of mental illness in American adolescents varies widely within and across areas. Proc Natl Acad Sci U S A. 117(39):24039–46. 2020.

Table 1. Emergency department visit rate for children and adolescents with a mental health disorder, by type of disorder: United States, 2018–2021

Disorder category (ICD–10–CM[1] code)	Rate per 1,000 children and adolescents	Standard error	95% confidence interval
Mental and behavioral disorders due to psychoactive substance use (F10–F19)	1.8	0.3	1.2–2.4
Mood [affective] disorders (F30–F39)	5.0	0.6	3.8–6.2
Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (F40–F48)	4.4	0.5	3.4–5.4
Pervasive and specific developmental disorders (F80–F89)	1.7	0.3	1.2–2.2
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence (F90–F98)	3.7	0.5	2.6–4.7
Other[2] (F01–F09, F20–F29, F50–F59, F60–F69, F70–F79, F99)	1.4	0.3	0.9–2.0

[1]Based on the *International Classification of Diseases, 10th Revision, Clinical Modification*.
[2]Includes mental disorders due to known physiological conditions (F01–F09); schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders (F20–F29); behavioral syndromes associated with physiological disturbances and physical factors (F50–F59); disorders of adult personality and behavior (F60–F69); intellectual disabilities (F70–F79); and mental disorder, not otherwise specified (F99).

NOTES: Rates are based on a sample of 726 emergency department visits by children and adolescents with any diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents). A visit may be represented in more than one mental health disorder category. Visit rates are based on the July 1, 2018; July 1, 2019; July 1, 2020; and July 1, 2021, sets of estimates of the U.S. civilian noninstitutionalized population developed by the U.S. Census Bureau, Population Division.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Table 2. Percentage of emergency department visits among children and adolescents, by mental health status and selected visit characteristics: United States, 2018–2021

	With mental health disorder			Without mental health disorder		
Visit characteristic	Percent	Standard error	95% confidence interval	Percent	Standard error	95% confidence interval
Expected source of payment[1]						
Private[2]	35.3	3.7	28.5–42.8	26.3	1.1	24.1–28.5
Medicare	*	*	*	0.5	0.1	0.3–0.9
Medicaid	60.2	3.8	52.7–67.3	67.5	1.2	65.1–69.8
No insurance[3]	*	*	*	4.1	0.3	3.4–4.8
Visit disposition						
Admitted to this hospital[2]	9.2	2.0	6.0–13.9	4.7	0.8	3.3–6.6
Transferred to a psychiatric hospital[2]	12.4	2.5	8.2–18.2	0.3	0.1	0.2–05
Visit wait and duration						
Wait time 1 hour or more[4]	15.1	2.6	10.8–20.8	15.5	1.2	13.3–17.9
Visit duration 4 hours or more[2,5]	42.0	3.4	35.5–48.6	17.8	1.2	15.6–20.3

* Estimate does not meet National Center for Health Statistics standards of reliability.
[1]Expected source of payment was missing or unknown for 9.3% of visits by children and adolescents with mental health disorders and 10.2% of visits by children and adolescents without mental health disorders. Missing and unknown data are excluded from the analysis. Other payment, which includes worker's compensation and any other payment source, is not shown in the table.
[2]Significantly higher than visits by children and adolescents without mental health disorders.
[3]Includes self-pay and no charge or charity.
[4]Wait time was missing for 13.9% of visits by children and adolescents with mental health disorders and 13.7% of visits by children and adolescents without mental health disorders.
[5]Duration of visit was missing for 8.1% of visits by children and adolescents with mental health disorders and 5.5% of visits by children and adolescents without mental health disorders.

NOTES: Percentages are based on a sample of 726 emergency department visits by children and adolescents with any diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits made by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Table 3. Percentage of emergency department visits among children and adolescents, by mental health status and principal reason for visit: United States, 2018–2021

Reason for visit[1]	With mental health disorder			Without mental health disorder		
	Percent	Standard error	95% confidence interval	Percent	Standard error	95% confidence interval
Symptoms referable to psychological and mental disorders or mental disorders[2]	31.4	3.0	25.8–37.6	1.1	0.1	0.9–1.4
Symptoms referable to other organs or systems[3]	20.3	2.5	15.8–25.7	50.1	0.7	48.7–51.5
Injuries, poisoning or adverse effect	18.0	2.5	13.6–23.5	19.7	0.7	18.4–21.1
General or special examinations, diagnostic tests or medications[2]	13.3	2.4	9.2–18.9	1.9	0.2	1.7–2.3
General symptoms[3]	6.4	1.4	4.1–9.8	18.8	0.6	17.7–20.0
Symptoms referable to nervous the system	5.6	1.3	3.6–8.7	4.1	0.2	3.6–4.5
Physical examination required for school or employment[2]	2.2	0.9	1.0–4.8	0.1	0.0	0.1–0.2
Other	*	*	*	4.4	0.6	3.4–5.7

0.0 Quantity more than zero but less than 0.05.
* Estimate does not meet National Center for Health Statistics standards of reliability.
[1]Based on the patient's own words and coded according to "A Reason for Visit Classification for Ambulatory Care," National Center for Health Statistics, Series Report 2, Number 78. Also see the 2021 National Hospital Ambulatory Medical Care Survey public-use data file documentation, Appendix II: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc21-ed-508.pdf. For this report, the codes were grouped and renamed as follows: 1100–1199 and 2300–2349, Symptoms referable to psychological and mental disorders or mental disorders; 1260–1999, Symptoms referable to other organs or systems; 5001–5935, Injuries, poisoning or adverse effect; 3100–4899, General or special examinations, diagnostic tests or medications; 1001–1099, General symptoms; 1200–1259, Symptoms referable to nervous the system; 7100–7140, Physical examination required for school or employment; other includes the disease module 2001–2999 (excluding 2300–2349), test results 6100–6700, uncodable entries 8990–8999, and unknown.
[2]Significantly higher than visits by children and adolescents without mental health disorders.
[3]Significantly lower than visits by children and adolescents without mental health disorders.

NOTES: Percentages are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Table 4. Percentage of emergency department visits among children and adolescents, by mental health status and selected hospital characteristics: United States, 2018–2021

Hospital characteristic	With mental health disorder			Without mental health disorder		
	Percent	Standard error	95% confidence interval	Percent	Standard error	95% confidence interval
Region						
Northeast	21.6	3.5	15.5–29.2	16.4	1.9	12.9–20.5
Midwest	26.3	3.5	20.0–33.7	21.6	2.6	16.9–27.2
South[1]	33.7	4.1	26.1–42.2	42.8	3.2	36.7–49.1
West	18.5	2.7	13.7–24.4	19.2	2.0	15.6–23.4
Metropolitan statistical area (MSA)[2]						
MSA	90.1	1.8	86.1–93.1	89.7	1.2	87.0–91.9
Non-MSA	9.9	1.8	6.9–13.9	10.3	1.2	8.1–13.0

[1]Significantly higher than visits in the West and Northeast among children and adolescents with mental health disorders and higher than visits in the Northeast, Midwest, and West among children and adolescents without mental health disorders.
[2]MSA is metropolitan statistical area. Status is based on the actual location of the hospital and MSA as defined by the U.S. Census Bureau and Office of Management and Budget; MSA is updated each year based on the latest Office of Management and Budget guidance. MSAs have at least one urbanized area of 50,000 or more population plus adjacent territory with a high degree of social and economic integration with the core, as measured by commuting ties. Non-MSAs include noncore rural areas as well as micropolitan statistical areas, which have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory with a high degree of social and economic integration with the core as measured by commuting ties.

NOTES: Percentages are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Table 5. Percentage of emergency department visits among children and adolescents, by mental health status and medication category: United States, 2018–2021

Medication category	With mental health disorder			Without mental health disorder		
	Percent	Standard error	95% confidence interval	Percent	Standard error	95% confidence interval
At least one psychiatric medication	24.4	2.8	18.9–30.5	7.0	0.4	6.3–7.9
Anxiolytics, sedatives, and hypnotics	13.6	2.0	10.1–18.1	5.6	0.3	5.0–6.3
Anticonvulsants	10.2	1.8	7.2–14.5	1.7	0.3	1.2–2.3
Antipsychotics	9.0	1.6	6.3–12.6	0.4	0.1	0.3–0.6
Antidepressants	7.5	1.6	4.8–11.3	0.4	0.1	0.3–0.6
Antiadrenergic agents, centrally acting	5.1	1.2	3.2–8.0	0.2	0.1	0.1–0.3
Central nervous system stimulants	2.7	0.8	1.5–4.7	0.3	0.1	0.2–0.5

NOTES: Percentages of visits by children and adolescents with mental health disorders are significantly higher than percentages of visits by those without mental health disorders for all medication categories. Percentages are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits. Medications were identified using the Cerner Multum second-level therapeutic category codes for anxiolytics, sedatives, and hypnotics (67); anticonvulsants (64); antipsychotics (251); antidepressants (249); antiadrenergic agents, centrally acting (44); and central nervous system stimulants (71), available from: https://www.cerner.com/solutions/drug-database. A visit may have more than one psychiatric medication.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Technical Notes

Table I. Emergency department visit rate for children and adolescents with a mental health disorder, by year: United States, 2018–2021

Year	Rate per 1,000 children and adolescents	Standard error	95% confidence interval
2018	11.9	1.8	8.4–15.4
2019	16.9	2.5	12.0–21.8
2020	12.9	2.5	8.0–17.9
2021	14.4	2.4	9.7–19.2

NOTE: Visit rates are based on the July 1, 2018; July 1, 2019; July 1, 2020; and July 1, 2021, sets of estimates of the U.S. civilian noninstitutionalized population developed by the U.S. Census Bureau, Population Division.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

Table II. Percentage of injury visits to emergency department among children and adolescents, by mental health status and principal reason for visit: United States, 2018–2021

Reason for visit[1] (code number)	With mental health disorder			Without mental health disorder		
	Percent	Standard error	95% confidence interval	Percent	Standard error	95% confidence interval
Violence, NOS[2]; Intentional self-mutilation; Suicide attempt; Intentional overdose; Adverse effect of drug abuse; Adverse effect of alcohol; and Alcohol poisoning[3] (5815.0; 5818.0; 5820.0; 5820.1; 5910.0; 5915.0; 5916.0)	49.9	6.8	35.5–64.2	1.7	0.3	1.1–2.3
Motor vehicle accident; Accident NOS[2] (5805.0; 5810.0)	*	*	*	9.6	1.1	7.6–11.9
Fractures and dislocations; Sprains and strains; Lacerations and cuts; Puncture wounds; Contusions, abrasions, and bruises; Injury, other and unspecified type; Foreign body; Burns; Bites; and Late effects of an old injury (5005.0–5050.0; 5105.0–5130.0; 5205.0–5230.0; 5305.0–5325.0; 5405.0–5430.0; 5505.0–5575.0; 5600.0–5620.0; 5705.0–5750.0; 5755.0–5760.0; 5800.0)	*	*	*	81.5	1.5	78.4–54.4
All other reasons ...	*	*	*	7.2	0.7	5.9–8.8

* Estimate does not meet National Center for Health Statistics standards of reliability.
… Category not applicable.
[1]The denominator is injury visits based only on the reason-for-visit classification. Reason for visit is based on the patient's own words and coded according to "A Reason for Visit Classification for Ambulatory Care," National Center for Health Statistics, Series Report 2, Number 78. Also see the 2021 National Hospital Ambulatory Medical Care Survey public-use data file documentation, Appendix II: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHAMCS/doc21-ed-508.pdf.
[2]Not otherwise specified.
[3]Significantly different from visits by children and adolescents without mental health disorders.

NOTES: Percentages are based on a sample of 726 emergency department visits by children and adolescents with any listed diagnosis of a mental health disorder, representing an annual average of 1,026,000 visits (3.5% of all emergency department visits by children and adolescents) and 14,207 emergency department visits by children and adolescents without a diagnosis of a mental health disorder, representing an annual average of 27,915,000 visits.

SOURCE: National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2018–2021.

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES

Centers for Disease Control and Prevention
National Center for Health Statistics
3311 Toledo Road, Room 4551, MS P08
Hyattsville, MD 20782–2064

For more NCHS NHSRs, visit:
https://www.cdc.gov/nchs/products/nhsr.htm.

National Health Statistics Reports ■ Number 191 ■ October 24, 2023

Suggested citation

Santo L, Peters ZJ, Davis D, DeFrances CJ. Emergency department visits related to mental health disorders among children and adolescents: United States, 2018–2021. National Health Statistics Reports; no 191. Hyattsville MD: National Center for Health Statistics. 2023. DOI: https://dx.doi.org/10.15620/cdc:132642.