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Research Article

Keywords:

Posted Date: November 9th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11211295/v1

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Additional Declarations: No competing interests reported.

Neurodevelopmental Disorder Documentation Among U.S. Adolescents Who Died by Suicide: A National Analysis of CDC WONDER Mortality Data, 2018–2024

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Abstract

Background: Neurodevelopmental disorders (NDDs), including attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and intellectual disability (ID), are associated with increased suicidality during adolescence. However, little is known about their representation in mortality records of adolescents who die by suicide. This study examined the frequency, demographic distribution, and temporal patterns of documented psychiatric and neurodevelopmental conditions among U.S. adolescents who died by suicide from 2018–2024.

Methods: We conducted a retrospective population-based analysis of 2018–2024 Multiple Cause of Death data from the CDC WONDER database. Suicide deaths among U.S. adolescents aged 10–19 years were identified using ICD-10 codes X60–X84 and Y87.0. Multiple-cause fields were queried for mental and behavioral disorders (F01–F99) and specifically ADHD (F90), ASD (F84), and ID (F70–F79). Demographic differences were assessed using chi-square tests, and Poisson regression was used to evaluate temporal trends. Suppressed cells (<10 deaths) were excluded from corresponding subgroup analyses.

Results: Among 19,369 adolescent suicide deaths, 1,226 (6.33%, 95% CI [5.99%–6.68%]) had a documented mental or behavioral disorder. ADHD was documented in 52 deaths (0.27%, 95% CI [0.20%–0.35%]), ASD in 18 (0.09%, 95% CI [0.06%–0.15%]), and ID was documented in 0 deaths. Documentation of mental or behavioral disorders was higher among adolescents aged 15–19 than those aged 10–14 years (6.68% vs. 4.88%), females than males (8.14% vs. 5.66%), White than Black adolescents (6.88% vs. 3.46%), and non-Hispanic than Hispanic adolescents (6.80% vs. 4.71%; all $p < .001$). Annual documentation ranged from 5.71% to 6.93%, with no significant variation across years ($p = .451$). NDD documentation remained sparse throughout the study period.

Conclusions: Among nearly 20,000 U.S. adolescent suicide deaths, mental and behavioral disorders were documented on the mortality record in approximately 1 in 16 deaths, while ADHD and ASD were documented in fewer than 1% and ID in 0 deaths. These findings should not be interpreted as estimates of the prevalence of NDDs among suicide decedents, but rather as evidence of limited NDD ascertainment in mortality records. The persistent documentation gap and observed demographic differences highlight an important limitation of mortality-based surveillance. Incorporating developmental and psychiatric histories into death investigations and linking mortality records with clinical data may improve NDD ascertainment and strengthen suicide surveillance and prevention for neurodivergent youth.

1. Introduction

Adolescence is a critical developmental period characterized by rapid biological, psychological, cognitive, and social transitions that shape subsequent health trajectories. During this stage, young people develop greater autonomy, establish identity, and acquire increasingly complex emotional, interpersonal, and executive skills while navigating academic and social pressures. These transitions coincide with a period in which many mental disorders first emerge. Globally, approximately one in seven adolescents aged 10–19 years experiences a mental disorder, highlighting adolescence as an important period for early identification and intervention [1]. Mental health problems during this developmental window can adversely affect functioning, relationships, educational attainment, and health across the course of life [1,2].

Suicide is a major and potentially preventable cause of mortality among young people worldwide [1,3]. Suicidal behavior arises through complex interactions among psychiatric illness, neurodevelopmental vulnerability, psychosocial adversity, and environmental stressors rather than from a single causal factor [3,4]. Identifying populations with potentially elevated vulnerability is therefore essential for improving suicide surveillance and developing targeted prevention strategies. In the United States, suicide remains a leading cause of death among youth, underscoring the need to better characterize suicide mortality in clinically vulnerable populations [3].

Neurodevelopmental disorders (NDDs), including autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and intellectual disability (ID), encompass conditions associated with developmental differences affecting cognitive, behavioral, social, and adaptive functioning [5]. Adolescents with NDDs may experience distinctive vulnerabilities, including psychiatric comorbidity, executive-function difficulties, emotional dysregulation, impulsivity, social isolation, bullying, stigma, and barriers to appropriate mental health care. In autism particularly, social masking may further complicate recognition of distress by allowing internal difficulties to remain less visible to families, educators, and clinicians. Consistent with these concerns, systematic reviews have demonstrated increased self-harm and suicidality among autistic individuals [6,7], while population-based research has reported elevated risks of suicidal behavior among individuals with ASD, particularly in the presence of comorbid ADHD [8]. Recent evidence also supports an association between ADHD and suicidality during adolescence, with psychological, family, peer, and social factors potentially influencing this relationship [9].

Despite growing recognition of the relationship between NDDs and suicidality, a substantial surveillance gap may remain between evidence of clinical vulnerability and

its representation in national mortality statistics. Existing literature has focused substantially on suicidal ideation, self-harm, suicide attempts, and mortality among selected or clinically defined populations, while comparatively little is known about how neurodevelopmental conditions are captured among adolescents who die by suicide [6–10]. Death certificates primarily document the underlying and contributing causes considered relevant to the death, and chronic underlying neurodevelopmental conditions are not consistently recorded. This could contribute to diagnostic overshadowing, in which the acute psychiatric crisis, behavioral presentation, or immediate cause of death may receive greater documentation emphasis than an underlying neurodevelopmental condition [11]. This discrepancy may be particularly relevant for conditions whose manifestations are less readily recognized during death investigations. This potential mismatch represents a possible surveillance gap: although clinical and epidemiological literature indicates elevated suicidality among neurodivergent youth, national vital-statistics records may provide substantially less visibility of these conditions [6–10].

Population-based mortality surveillance provides an opportunity to examine this surveillance gap at the national level. The Centers for Disease Control and Prevention Wide-ranging Online Data for Epidemiologic Research (CDC WONDER) Multiple Cause of Death database contains U.S. mortality data derived from death certificates and permits examination of underlying and contributing causes of death alongside demographic and geographic characteristics [12,13]. Importantly, the database permits quantification of deaths in which specific neurodevelopmental diagnoses were documented. Comparing documentation across NDD categories may therefore characterize whether ADHD, ASD, and ID are differentially represented in death-certificate data and generate hypotheses regarding differential recognition or documentation. This study therefore examines these differences in documentation over time.

Therefore, this study uses CDC WONDER Multiple Cause of Death data from 2018 through 2024 to characterize suicide mortality and neurodevelopmental disorder documentation among U.S. adolescents aged 10–19 years. The primary objective is to determine population-level mortality counts and documentation frequencies for ASD, ADHD, and ID among adolescents dying by suicide. Secondarily, we evaluate longitudinal stability, small-cell suppression patterns, and documentation gaps across the study period, with particular attention to the surveillance gap. A tertiary objective is to descriptively compare the representation of neurodevelopmental conditions with broader psychiatric conditions in mortality records. By characterizing these patterns nationally, this study aims to clarify the public health implications of differential NDD visibility within mortality records and identify opportunities for improved suicide surveillance, recognition, and documentation of neurodevelopmental conditions.

2. Methods

Study Design

This study utilized a population-based, retrospective observational design to investigate adolescent suicide mortality and the documentation of psychiatric and neurodevelopmental conditions, following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. Mortality data and population denominators were extracted from the Centers for Disease Control and Prevention WONDER (Wide-ranging Online Data for Epidemiologic Research) online database, specifically utilizing the Multiple Cause of Death (MCD) public-use data files covering the seven-year surveillance period from 2018 through 2024. The MCD dataset compiles demographic, geographic, and cause-of-death information derived from death certificates filed across all 50 states and the District of Columbia, as provided through the National Vital Statistics System.

Ethics and Data Availability

This study used publicly available, de-identified aggregate mortality data from the CDC WONDER Multiple Cause of Death database and did not involve direct interaction with human participants. No individual-level identifying information was accessed or reported. Data were used solely for statistical reporting and analysis in accordance with CDC WONDER data-use restrictions.

Study Population and Cohort Definitions

The study cohort comprised all suicide deaths among adolescents aged 10 to 19 years residing in the United States where the underlying cause of death (UCD) was classified as intentional self-harm (suicide) according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10 codes X60–X84, Y87.0). Records were stratified by demographic characteristics, including five-year age groups (10–14 years and 15–19 years), sex (male and female), race (White, Black or African American), and ethnicity (Hispanic or Latino and Not Hispanic or Latino). The overall cohort denominator for analyses of adolescent suicide deaths was 19,369.

Identification of Psychiatric and Neurodevelopmental Documentation

To evaluate the documentation of psychiatric conditions at the time of death, multiple-cause-of-death fields were queried for ICD-10 Chapter V codes (Mental and behavioral disorders, F01–F99). Broad psychiatric documentation was defined as the presence of any ICD-10 F01–F99 code among the multiple causes recorded on the death certificate. Specific neurodevelopmental conditions were identified by corresponding ICD-10 codes recorded among the multiple causes of death, including ADHD (F90), Autism Spectrum Disorder (F84), and Intellectual Disability (F70–F79). These classifications reflect documentation recorded on mortality records and should not be interpreted as estimates of the true prevalence of these conditions among individuals who died by suicide.

To comply with CDC WONDER data privacy standards, cells involving fewer than 10 deaths were subject to small-cell suppression and reported as suppressed (<10) to maintain privacy and prevent deductive identification.

Statistical Analysis

Crude annual mortality rates per 100,000 population were calculated by dividing annual adolescent suicide death counts by the corresponding resident population estimates provided through CDC WONDER. Proportions of documented psychiatric conditions across demographic strata were compared using chi-square tests of independence, with statistical significance evaluated at an alpha level of 0.05.

To evaluate temporal trends in documented psychiatric conditions, Poisson regression models were fitted using the annual number of suicide deaths with documented psychiatric conditions as the outcome, with the annual total number of adolescent suicide deaths included as an offset and calendar year as the predictor. Incidence rate ratios (IRRs) and corresponding 95% confidence intervals (CIs) were estimated. In this context, the IRR represents the estimated annual change in the proportion of adolescent suicide deaths with documented psychiatric conditions and should not be interpreted as a measure of psychiatric disease incidence, causation, or evidence that psychiatric disorders caused the deaths.

All data extraction, cleaning, table generation, and statistical analyses were performed using Python data science libraries. For demographic comparisons, analyses were restricted to categories with available, nonsuppressed counts; missing or suppressed categories were excluded from the corresponding comparisons.

3. Results

Overall Epidemiological Characteristics of Adolescent Suicide Deaths

Between 2018 and 2024, a total of 19,369 suicide deaths were recorded among adolescents aged 10 to 19 years in the national database (Table 1). Stratified by age group, adolescents aged 15 to 19 years accounted for the vast majority of mortality events (n = 15,599, 80.54%), while those aged 10 to 14 years comprised 19.46% (n = 3,770). Analysis by sex revealed a marked male predominance, with males accounting for 72.93% (n = 14,125) of deaths compared with 27.07% (n = 5,244) among females.

Table 1. Characteristics of Adolescent Suicide Deaths (2018–2024)

Demographic Variable	Total Deaths (n)	Percentage (%)
Total Deaths	19,369	100.00%
Age Group		
10–14 years	3,770	19.46%

15–19 years	15,599	80.54%
Sex		
Male	14,125	72.93%
Female	5,244	27.07%
Race*		
White	14,587	85.73%
Black or African American	2,427	14.27%
Ethnicity*		
Not Hispanic or Latino	13,723	80.66%
Hispanic or Latino	3,291	19.34%

*Note: Race and Ethnicity totals do not equal the primary denominator (19,369) due to CDC WONDER suppression of minoritized sub-categories or missing vital statistics demographic codes.

Where racial and ethnic data were available without suppression, deaths were predominantly White (85.73%, n = 14,587), followed by Black or African American (14.27%, n = 2,427). Regarding ethnicity, 80.66% (n = 13,723) were classified as Not Hispanic or Latino and 19.34% (n = 3,291) as Hispanic or Latino. Race and ethnicity totals do not sum to the overall denominator because of missing or suppressed demographic categories in the CDC WONDER data.

Crude annual mortality rates per 100,000 population demonstrated fluctuations over the seven-year surveillance window, moving from 7.20 per 100,000 in 2018 (n = 2,659) to 6.04 per 100,000 in 2024 (n = 2,259) (Table 2). Subgroup mortality rate stratification indicated a substantially higher crude rate in older adolescents aged 15–19 years (10.36 per 100,000) compared with the 10–14 age bracket (2.60 per 100,000), as well as a more than twofold elevation among males (9.46 per 100,000) relative to females (3.51 per 100,000) (Table 3).

Table 2. Annual Adolescent Suicide Mortality Rates and Temporal Trends (2018–2024)

Year	Total Suicides	Population	Crude Rate (per 100,000)	Psychiatric Deaths (F01-F99)	Psychiatric Proportion	Trend Estimate (IRR)
2018	2,659	36,943,432	7.2	182	6.84%	IRR: 0.975
2019	2,410	36,754,455	6.56	161	6.68%	95% CI: [0.967, 0.982]
2020	2,457	36,546,947	6.72	144	5.86%	p-value: < .001

2021	2,586	37,613,318	6.88	170	6.57%	
2022	2,348	37,049,495	6.34	143	6.09%	
2023	2,295	37,267,204	6.16	159	6.93%	
2024	2,259	37,381,035	6.04	129	5.71%	

Table 3. Adolescent Suicide Mortality Rates Stratified by Subgroup (2018–2024 Baseline)

Demographic Group	Deaths (n)	Population	Crude Rate (per 100,000)
Age Group			
10–14 years	3,312	127,243,435	2.6
15–19 years	13,702	132,312,451	10.36
Sex			
Male	12,572	132,831,766	9.46
Female	4,442	126,724,120	3.51

Frequency and Diagnostic Distribution of Documented Psychiatric Conditions

Among the 19,369 adolescent suicide deaths, 1,226 deaths (6.33%, 95% CI: 5.99%–6.68%) had any documented broad psychiatric condition (ICD-10 F01–F99) on their mortality records (Table 4). Specific neurodevelopmental conditions were documented infrequently: ADHD (F90) was documented in 52 cases (0.27%, 95% CI: 0.20%–0.35%), Autism Spectrum Disorder (F84) in 18 cases (0.09%, 95% CI: 0.06%–0.15%), and Intellectual Disability (F70–F79) in 0 cases (0.00%, 95% CI: 0.00%–0.02%).

Table 4. Documented Psychiatric and Neurodevelopmental Disorders Among Adolescent Suicide Deaths

Diagnostic Category	n	% of Total Suicides	95% Confidence Interval
Broad Psychiatric Conditions (F01–F99)	1,226	6.33%	[5.99%, 6.68%]
ADHD (F90)	52	0.27%	[0.20%, 0.35%]
Autism Spectrum Disorder (F84)	18	0.09%	[0.06%, 0.15%]
Intellectual Disabilities (F70–F79)	0	0.00%	[0.00%, 0.02%]

An examination of the 1,502 total documented subchapter conditions, reflecting multiple diagnoses that may be recorded for an individual death, revealed that mood [affective] disorders were the most frequently documented category, accounting for 58.06% (n = 872) of all documented subchapter conditions. This was followed by mental and behavioral disorders due to psychoactive substance use (17.58%, n = 264) and neurotic, stress-related, and somatoform disorders (14.58%, n = 219). Childhood-onset behavioral and emotional disorders (F90–F98), including ADHD, comprised 4.99% (n = 75), organic mental disorders accounted for 1.73% (n = 26), schizophrenia and delusional disorders represented 1.20% (n = 18), and disorders of psychological development, including Autism Spectrum Disorder, accounted for 1.20% (n = 18). Disorders of adult personality and behavior accounted for 0.67% (n = 10), while intellectual disabilities (F70–F79) accounted for 0 cases (Table 5).

Because individual deaths may have more than one documented psychiatric diagnosis, the 1,502 documented subchapter conditions should not be interpreted as 1,502 unique deaths.

Table 5. Hierarchy and Frequency Ranking of Documented Psychiatric Conditions (F01–F99)

MCD - ICD Sub-Chapter	Deaths (n)	% of Documented Psychiatric Diagnoses/Conditions
Mood [affective] disorders	872	58.06%
Mental and behavioural disorders due to psychoactive substance use	264	17.58%
Neurotic, stress-related and somatoform disorders	219	14.58%
Behavioural/emotional disorders with onset in childhood (incl. ADHD)	75	4.99%
Organic, including symptomatic, mental disorders	26	1.73%
Schizophrenia, schizotypal and delusional disorders	18	1.20%
Disorders of psychological development (incl. Autism)	18	1.20%
Disorders of adult personality and behaviour	10	0.67%
Mental retardation (Intellectual Disabilities)	0	0.00%

Demographic Differences in Psychiatric Documentation

The proportion of suicide deaths with documented psychiatric conditions varied significantly across demographic subgroups ($p < .001$ for age, sex, race, and ethnicity) (Table 6). Older adolescents aged 15–19 years exhibited a higher rate of psychiatric documentation (6.68%, n = 1,042) compared with younger adolescents aged 10–14 years (4.88%, n = 184). Females demonstrated a higher frequency of documented psychiatric conditions (8.14%, n = 427) than males (5.66%, n = 799).

Racial and ethnic differences were also observed. White adolescents showed a psychiatric documentation rate of 6.88% (n = 1,004), whereas Black or African American adolescents exhibited a lower documentation rate of 3.46% (n = 84). Not Hispanic or Latino adolescent deaths had a psychiatric documentation proportion of 6.80% (n = 933), compared with 4.71% (n = 155) among Hispanic or Latino adolescents. These findings describe differences in documented psychiatric conditions and should not be interpreted as evidence that psychiatric illness itself was less prevalent in any demographic group.

Table 6. Psychiatric Documentation Proportions Stratified by Demographic Characteristics

Variable	Total Deaths	Psychiatric Documented n (%)	No Psychiatric Documentation n (%)	p-value
Age Group				
10–14 years	3,770	184 (4.88%)	3,586 (95.12%)	< .001
15–19 years	15,599	1,042 (6.68%)	14,557 (93.32%)	
Sex				
Male	14,125	799 (5.66%)	13,326 (94.34%)	< .001
Female	5,244	427 (8.14%)	4,817 (91.86%)	
Race				
Black or African American	2,427	84 (3.46%)	2,343 (96.54%)	< .001
White	14,587	1,004 (6.88%)	13,583 (93.12%)	
Ethnicity				
Hispanic or Latino	3,291	155 (4.71%)	3,136 (95.29%)	< .001
Not Hispanic or Latino	13,723	933 (6.80%)	12,790 (93.20%)	
Year				

2018	2,659	182 (6.84%)	2,477 (93.16%)	0.451
2019	2,410	161 (6.68%)	2,249 (93.32%)	
2020	2,457	144 (5.86%)	2,313 (94.14%)	
2021	2,586	170 (6.57%)	2,416 (93.43%)	
2022	2,348	143 (6.09%)	2,205 (93.91%)	
2023	2,295	159 (6.93%)	2,136 (93.07%)	
2024	2,259	129 (5.71%)	2,130 (94.29%)	

Temporal Trends in Mortality and Psychiatric Documentation

Annual tracking from 2018 through 2024 demonstrated relatively stable psychiatric documentation proportions, ranging from 5.71% (n = 129 of 2,259) in 2024 to 6.93% (n = 159 of 2,295) in 2023, with no statistically significant variation in annual proportions (p = 0.451) (Table 6). Although the annual proportions did not differ significantly across calendar years (p = 0.451), Poisson regression identified a statistically significant but small downward temporal trend in the documentation rate (IRR = 0.975, 95% CI: 0.967–0.982; p < .001). These findings are not contradictory because the chi-square analysis tests differences among annual proportions, whereas the regression estimates a linear temporal trend across years.

Year-by-year examination of documented neurodevelopmental conditions showed persistent small-cell suppression and sparse recording. Annual ADHD-documented suicide counts ranged from suppressed values (<10) to 12 cases per year, with 11 cases in 2019, 11 in 2020, 11 in 2023, and 12 in 2024. Autism Spectrum Disorder documentation remained suppressed (<10 cases annually), while Intellectual Disability (F70–F79) documentation was 0 cases in every year evaluated (Table 7).

Table 7. Year-by-Year Trajectory of Documented Neurodevelopmental Suicides (2018–2024)

Year	ADHD (F90)	Autism Spectrum Disorder (F84)	Intellectual Disabilities (F70–F79)
2018	Suppressed (< 10)	Suppressed (< 10)	0
2019	11	Suppressed (< 10)	0
2020	11	Suppressed (< 10)	0
2021	Suppressed (< 10)	Suppressed (< 10)	0
2022	Suppressed (< 10)	Suppressed (< 10)	0
2023	11	Suppressed (< 10)	0
2024	12	Suppressed (< 10)	0

*Note: In accordance with CDC WONDER privacy rules, cells with fewer than 10 deaths are suppressed and reported as such to prevent deductive identification.

5. Discussion

The seven-year analysis of national suicide mortality records among adolescents demonstrated consistently low documentation of psychiatric and neurodevelopmental conditions. Although the Poisson regression model demonstrated a slight downward trend in the annual rate of documented psychiatric conditions (IRR = 0.975), the proportion of suicide deaths with documented psychiatric conditions remained relatively stable throughout the study period ($p = 0.451$). Of the 19,369 suicide deaths tracked over this period, 6.33% had a documented psychiatric condition on the mortality record.

This finding contrasts with population-based evidence demonstrating a substantially elevated risk of suicidal death among individuals with psychiatric disorders. However, this finding should not be interpreted as evidence of low psychiatric morbidity among suicide deaths, because mortality records do not capture comprehensive clinical histories. A population-based cohort study by Song et al. reported markedly increased suicide risk among individuals with psychiatric disorders [16]. Furthermore, national research has demonstrated that more than one in seven U.S. children and adolescents experiences a mental health disorder [17], while recent Global Burden of Disease analyses have demonstrated a substantial burden of mental disorders among children and adolescents [18]. Mental health disorders are recognized as important risk factors for suicide, and neurodevelopmental disorders have also been associated with increased suicidality across populations [19–21].

Our findings therefore suggest that psychiatric conditions may be incompletely represented in adolescent suicide mortality records. These findings are consistent with previous national mortality research demonstrating relatively low documentation of psychiatric disorders on death certificates despite the established relationship between psychiatric illness and suicide [22]. A national report published in 2002 similarly emphasized the substantial proportion of individuals who die by suicide who have a history of mental illness or mental health treatment [23]. Taken together, the persistent low level of psychiatric documentation observed in the present study may represent a longstanding limitation of mortality-record documentation rather than a true absence of psychiatric illness among adolescents who die by suicide.

Of the 1,226 adolescent suicide deaths with documented psychiatric conditions, childhood-onset behavioral and emotional disorders accounted for only 4.99% of documented subchapter conditions. ADHD specifically was documented in 0.27% of all suicide deaths, Autism Spectrum Disorder in 0.09%, and Intellectual Disability in 0.00%. Among the 1,502 recorded psychiatric diagnostic occurrences, mood [affective]

disorders accounted for 58.06% (n = 872). This pattern is notable given the prevalence of neurodevelopmental disorders among U.S. youth. ADHD affects millions of U.S. children and adolescents, and many affected children have co-occurring psychiatric or behavioral conditions [24]. Individuals with ADHD have also demonstrated elevated risk of suicidal behavior in prior studies [25,26], while systematic reviews have demonstrated elevated suicidality among autistic individuals [7]. The low representation of these conditions in mortality documentation does not establish that neurodevelopmental disorders were absent from the affected population. Rather, it raises the possibility that neurodevelopmental conditions are incompletely captured on death certificates.

The discrepancy between the high documented representation of mood disorders and the comparatively sparse documentation of neurodevelopmental disorders may be consistent with differences in diagnostic recognition or documentation, including the possibility of diagnostic overshadowing. However, because CDC WONDER contains mortality records rather than comprehensive clinical histories, the present study cannot determine whether a documented mood disorder was actually the principal psychiatric contributor to a death or whether a neurodevelopmental disorder was present but omitted from the mortality record. Accordingly, the findings should be interpreted as evidence of differential documentation rather than proof of diagnostic overshadowing.

The documentation of psychiatric conditions also differed by sex. Although males accounted for substantially more suicide deaths overall than females (72.93% vs 27.07%), females had a higher proportion of deaths with documented psychiatric conditions (8.14% vs 5.66%). This finding may reflect differences in psychiatric recognition, help-seeking, diagnostic patterns, or documentation practices. Previous research has demonstrated that females with ADHD may be diagnosed later and may present with more internalized or less externally disruptive symptoms, potentially contributing to missed or delayed recognition [26,27]. However, the present dataset does not permit determination of whether these mechanisms explain the observed mortality-documentation pattern. In particular, because sex-specific ADHD counts were not directly available from the presented analysis, the observed difference in overall psychiatric documentation should not be interpreted as evidence of a specific sex difference in ADHD-related suicide mortality.

Similarly, older adolescents aged 15–19 years had a higher proportion of documented psychiatric conditions than younger adolescents aged 10–14 years (6.68% vs 4.88%). Older adolescents also had a substantially higher crude suicide mortality rate than younger adolescents. Previous research has demonstrated differences in suicidal behavior and suicide attempts across adolescent age groups [28]. It is possible that differences in diagnostic recognition, healthcare contact, or death-investigation practices contribute to the lower level of documentation among younger adolescents.

Differences were also observed across racial and ethnic groups. Suicide deaths among Black or African American adolescents had a lower psychiatric documentation proportion than deaths among White adolescents (3.46% vs 6.88%), while Hispanic or Latino adolescents had a lower proportion than Not Hispanic or Latino adolescents (4.71% vs 6.80%). These findings are important in the context of previous research demonstrating racial and ethnic differences in the classification and ascertainment of suicide mortality [29]. Rockett et al. reported that suicide misclassification may disproportionately affect minority populations, including Black and Hispanic individuals [29]. Potential explanations include differences in healthcare access, psychiatric history documentation, socioeconomic conditions, cultural attitudes toward suicide, and the circumstances surrounding death investigation. The observed disparities therefore warrant further investigation rather than interpretation as evidence of an inherent difference in psychiatric illness between demographic groups.

Overall, the findings reveal a marked discrepancy between the established association of neurodevelopmental disorders with suicidality and their representation in national adolescent suicide mortality records. This surveillance gap reflects a potential discrepancy between clinical vulnerability and mortality-record visibility. The present study does not establish that neurodevelopmental disorders caused or contributed to individual deaths, nor can it establish the true prevalence of these conditions among adolescents who died by suicide. Nevertheless, the consistently sparse documentation of ADHD, Autism Spectrum Disorder, and Intellectual Disability suggests that mortality surveillance may not fully capture neurodevelopmental vulnerabilities that are clinically relevant to suicide prevention.

More systematic review of available psychiatric and developmental histories during death investigation may improve the completeness of mortality documentation. Improved recognition of neurodevelopmental conditions could potentially strengthen suicide surveillance and improve understanding of the populations at risk.

6. Limitations

This study has several limitations. Most importantly, psychiatric and neurodevelopmental conditions were identified through their documentation in mortality records rather than comprehensive clinical records. Therefore, the findings reflect documented diagnoses rather than the true prevalence of these conditions, and incomplete documentation may result in under-ascertainment, particularly for less frequently documented conditions such as ADHD, Autism Spectrum Disorder, and Intellectual Disability [30,31].

Additionally, CDC WONDER does not provide detailed individual-level clinical information, limiting assessment of potentially important factors such as symptom severity, treatment history, previous suicide attempts, medication use, substance use, and psychosocial stressors. Another significant limitation is that the aggregate nature of the dataset limits adjustment for individual-level confounding; consequently,

differences in psychiatric documentation across demographic groups may partly reflect variation in healthcare access, diagnostic practices, documentation patterns, socioeconomic factors, or other unmeasured characteristics.

The study is also subject to limitations inherent to death-certificate data. Previous research has demonstrated that psychiatric diagnoses may be inconsistently represented on death certificates and that errors in death certification can affect mortality statistics [30,31]. Furthermore, suppression of counts below 10 limits detailed interpretation of rare diagnostic and demographic subgroups, particularly for neurodevelopmental conditions [12].

The study should therefore be interpreted as an analysis of mortality-record documentation rather than an estimate of the actual prevalence of psychiatric or neurodevelopmental disorders among adolescents who died by suicide. Despite these limitations, the use of a large, population-based national mortality dataset provides valuable insight into patterns of documented psychiatric and neurodevelopmental conditions among adolescents who died by suicide.

7. Conclusion

This study found that psychiatric and neurodevelopmental conditions were infrequently documented on mortality records among U.S. adolescents who died by suicide. The particularly sparse documentation of ADHD, Autism Spectrum Disorder, and Intellectual Disability contrasts with the established literature demonstrating elevated suicidality among individuals with these conditions. The findings may indicate important gaps in mortality-record ascertainment and documentation, particularly among demographic groups in which differences in diagnosis, healthcare access, and death-investigation practices may influence documentation.

Addressing these potential gaps could include greater awareness of neurodevelopmental conditions during death investigations, improved death-certification practices, and broader consideration of available psychiatric and developmental histories. Strengthening identification and documentation of these conditions may improve understanding of youth suicide mortality and support more targeted prevention and surveillance efforts. Future studies linking mortality records with clinical or administrative data are needed to determine the extent to which neurodevelopmental diagnoses are incompletely captured in mortality surveillance.

Funding Declaration: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Clinical Trial Number: Not applicable.

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