

# Mental Health in Adolescents: Analysis of a Nationally Representative Dataset, 2009-2018

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**Abstract - According to the World Health Organization (WHO), adolescence marks a period of vulnerability for the onset of mental health conditions. Depression is the ninth leading cause of illness and disability in all adolescents. In this paper, data from the National Survey on Drug Use and Health (NSDUH; N=563,275), a nationally representative survey of U.S. adolescents and adults, were analyzed. Between 2009 and 2018, increases in rates of major depressive episodes (MDE) in the past year (66.5%), serious psychological distress in the last month (82.7%), serious thinking about killing self in the past year (59.5%) were observed among adolescents, with girls having higher rates of MDE than boys (20.89% vs. 8.28% in 2018) and also higher percent change in rates than boys (70.0% vs 62.1%). The same trend was not found for adults ages 26 and over. Black non-Hispanic adolescents had a lower rate of MDE than other race/ethnicity groups in all years (9.83% vs. at least 14.66% in 2018). Results suggest the need for more mental health prevention and treatment programs for adolescents, who are undergoing a critical juncture in their development.**

*Key Words – mental health, adolescents, depression*

## INTRODUCTION

Adolescence, defined as when an individual is between 10-19 years of age, is a critical period for later life health and well-being. Supportive family, school, and community environments allow adolescents to maintain their mental health. However, adolescents are particularly vulnerable to the onset of mental health conditions. For U.S. adolescents and young adults, serious psychological distress, major depression, suicidal thoughts, and attempted suicide were more common in the late 2010s than in the mid-2000s [1]. Every year, mental illnesses take a heavy toll on adolescents worldwide. Globally, suicide is the third leading cause of death in teenagers aged 15 to 19, with an estimated 53,000 deaths due to suicide in 2016. Notably, it is the second leading cause of death for girls in this age group. Recognized risks for adolescent mental health problems include, but are not limited to poverty, violence, forced migration, substance use, chronic illness, harsh parenting, bullying, sexual violence, early pregnancy, early and/or forced marriages, and being a member of a minority or discriminated group [2].

According to a report from the WHO and its partners, most adolescent deaths can be prevented with good health services, education, and social support. But in many cases, adolescents who suffer from mental health disorders, substance use, or poor nutrition cannot obtain critical prevention and care services – either because these services do not exist, or because of a lack of awareness of these services. In addition, many behaviors that impact health later in life, such as physical inactivity, poor diet, and risky sexual health behaviors, develop during adolescence.

"Adolescents have been entirely absent from national health plans for decades," says Dr. Flavia Bustreo, the Assistant Director-General of the WHO. "Relatively small investments focused on adolescents now will not only result in healthy and empowered adults who thrive and contribute positively to their communities, but it will also result in healthier future generations, yielding enormous returns." [2]

The present study examines the 10-year trend in the rates of MDE, serious psychological distress, and serious suicidal thoughts for adolescents in the U.S. Knowledge of changing mental health trends provides important insight into potential risks, as well as protective factors, for adolescents. Research results in trends for various mental health problems in adolescents are variable [3]. Twenge and her co-authors analyzed data from the National Survey on Drug Use and Health (NSDUH), which is a nationally representative survey that has tracked drug and alcohol use, mental health, and other health-related issues in individuals age 12 and over in the U.S. [1]. They analyzed survey responses from more than 200,000 adolescents between the ages of 12 and 17 from 2005 to 2017. Additionally, they looked at the results of almost 400,000 adults aged 18 and over from 2008 to 2017. The rate of individuals reporting symptoms consistent with major depression in the last 12 months increased 52 percent in adolescents from 2005 to 2017 (from 8.7 percent to 13.2 percent) and 63 percent in young adults aged 18 to 25 from 2009 to 2017 (from 8.1 percent to 13.2 percent).

In addition, Sourander and co-authors examined the 10-year time trend changes of psychiatric symptoms, smoking and alcohol use in a study of Finnish adolescents [4]. Representative population-based samples with same methods at two time-points, same age range and with 10-year period between the time points were gathered to investigate secular changes in adolescents' emotional and behavioral problems. Seventh and ninth grade students filled in the Strengths and Difficulties Questionnaire (SDQ) and

questions regarding alcohol use and smoking anonymously during a school lesson in 1998 (n = 1458) and 2008 (n = 1569). The self-reports of SDQ showed substantial stability in emotional and behavioral problems from 1998 to 2008. There was no increase between the two timepoints in self-reports of SDQ total, conduct, hyperactivity, emotional or peer problems when using the 90th percentile clinical cut-off points.

This paper focuses on the mental health of adolescents in the U.S., and uses the most recent NSDUH data to compare mental health conditions between adolescents and older adults, girls and boys, and among race/ethnicity groups. The need for mental health treatment is also analyzed over the 10-year period from 2009 to 2018.

## METHODS

Data used in this study are from NDSUH, which is an annual survey of participants of 12 years and older, administered by the U.S. Substance Abuse and Mental Health Services Administration since 1971, but the survey underwent significant questionnaire redesign and improvements in 1979 and 2002 [5]. Data are available for public use. A total of 563,275 adolescents and adults participated in the survey during the 10-year study period. The numbers of participants were similar across years, ranging from 55,160 (the lowest count) in 2013 to 58,397 (the highest count) in 2011. Demographic variables included sex (male or female) and race/ethnicity (black, white, Hispanic, or other). The overall response rate was 48.79 percent for people aged 12 or older [5].

Outcome variables included in this study were: MDE in the past year, serious psychological distress in the past month, seriously think about killing self in the past 12 months, and needed mental health treatment but did not get it in the past 12 months. All these data were collected consistently over the study period. However, while MDE was available for all participants of NDSUH, the other 3 variables were available for participants of 18 years and older. All analyses were descriptive in nature and results were not weighted based on the age distribution of the U.S. population. P-values were from Chi-square test for comparing 2-sample proportions. Due to disclosure limitations for respondent confidentiality, a state variable is not included in public-release datasets.

## RESULTS

Of the 563,275 participants included in this study, 200,162 (35.5 percent), 121,159 (21.5 percent) and 241,954 (43.0 percent) were 12-19, 20-25 and 26+ years old, respectively. Of the 200,162 adolescents, 98,574 (49.3 percent) were girls, 111,474 (55.7 percent), 27,181 (13.6 percent), 40,334 (20.4 percent), and 21,173 (10.6 percent) were White (non-Hispanic), Black (non-Hispanic), Hispanic, and Other, respectively.

Figure 1 shows that the percent with MDE in the past year increased for the 12-19 and 20-25 age groups, especially after 2011. The 12-19 age group had the highest increase, changing from 8.67 percent in 2009 to 14.43 percent in 2018 (P<0.001), a relative change of 66.5 percent (Table 1). The percent with MDE for the 26+ age group declined slightly from 7.69 percent in 2009 to 7.24 percent in 2018 (P=0.066), a relative decrease of 5.8 percent (Table 1).

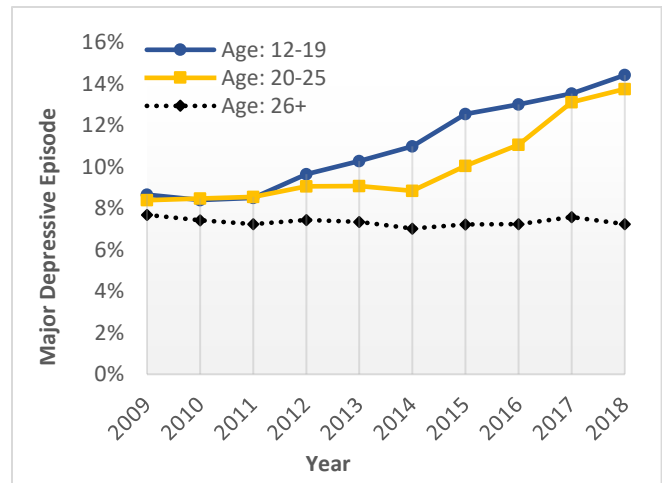


FIGURE 1: Percent with MDE in the past year by age group, 2009-2018.

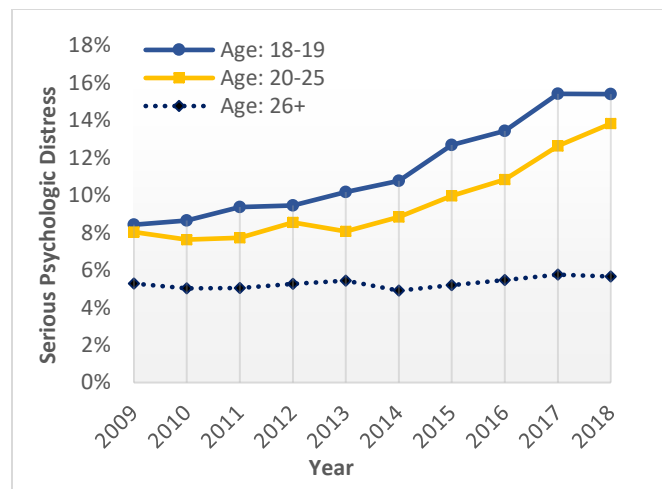


FIGURE 2: Percent with serious psychological distress in the past month by age group, 2009-2018.

Percent with serious psychological distress in the past month and percent with serious thinking about killing self were presented in Figure 2 and Figure 3, respectively, with data included in Table 1. The trends were similar in Figure 2 and Figure 3. The 18-19 age group had the highest percent with these mental health outcomes among the 3 age groups. The relative percent changes over the 10-year period in this study were 82.7 percent and 59.5 percent for serious psychological distress in the past month and serious thinking about killing self in the past 12 months (P<0.001 for both),

respectively, for the 18-19 age group. There were no significant changes in these mental health outcomes for the 26+ age group (P=0.082 and P=0.45, respectively).

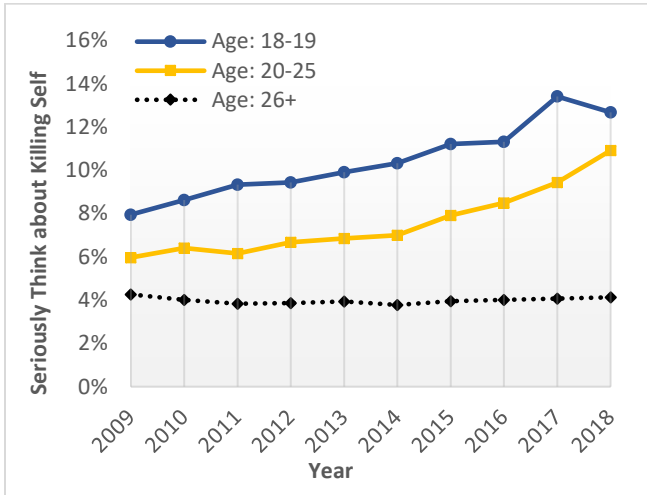


FIGURE 3: Percent with serious thinking about killing self in the past year by age group, 2009-2018.

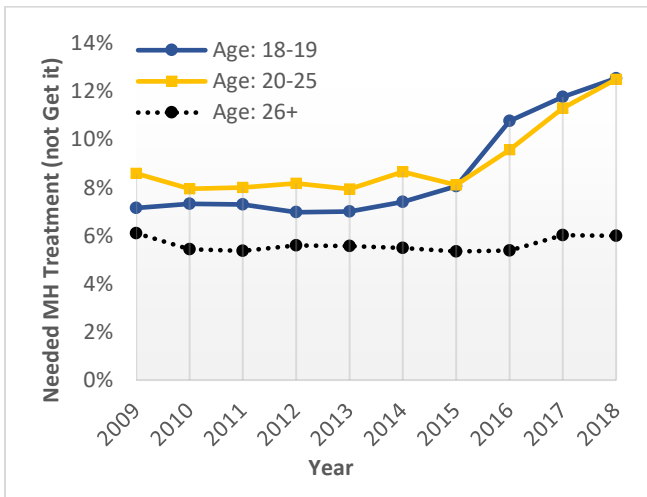


FIGURE 4: Percent needing mental health treatment but did not get it in the past year by age group, 2009-2018.

As shown in Figure 4, the 18-19 and 20-25 age groups had higher percent of participants who needed mental health treatment but did not get it in the past year, as compared to the 26+ age group. Both the 18-19 and 20-25 age groups reported increasing cases of not getting mental health treatment starting 2015, particularly for the 18-19 age group. The 18-19 age group had noticeably lower percent than the 20-25 age group for each year before 2015 but had similar or slightly higher percent after 2015.

There were differences in self-reported MDE in the past year between boys and girls, and among race/ethnicity groups, as shown in Figure 5 and 6, and Table 2. Figure 5 shows that girls had remarkably higher percent of MDE than boys, for each year during the 10-year period (P<0.001), with the difference being larger in more recent years. Since 2009,

the percent increased from 12.29 percent to 20.89 percent for girls (a relative percent increase of 70.0 percent, P<0.001), and increased from 5.11 percent to 8.28 percent for boys (a relative percent increase of 62.1 percent, P<0.001).

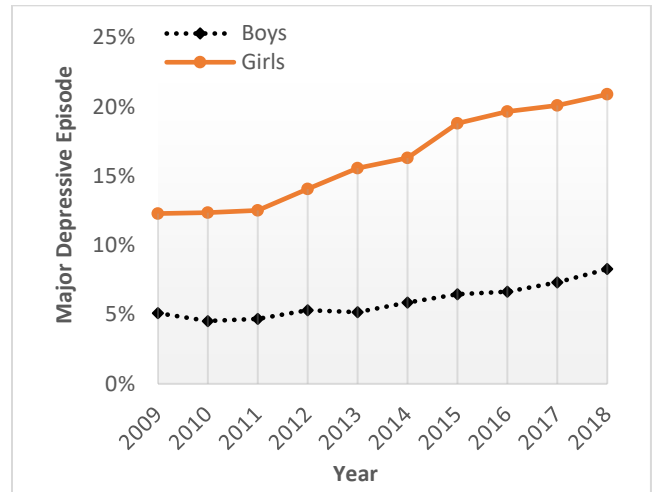


FIGURE 5: Percent with MDE in the past year by sex, 2009-2018.

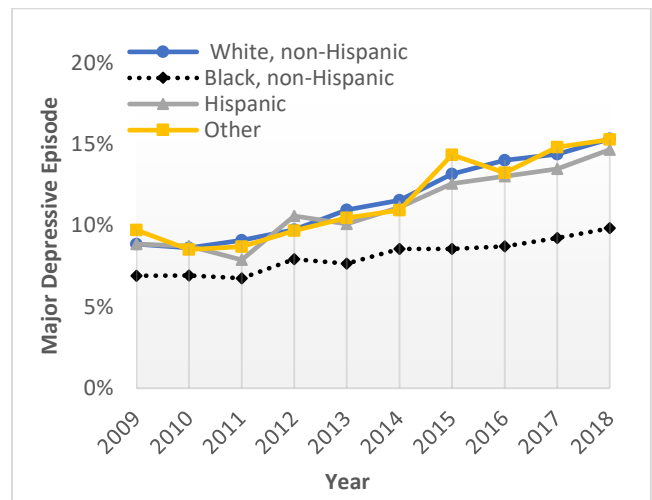


FIGURE 6: Percent with MDE in the past year by race/ethnicity group, 2009-2018.

TABLE 1: Percent of participants with each mental health outcome by age group

Age (years)	Outcomes	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Change
12-19	MDE	8.67	8.40	8.51	9.65	10.28	11.00	12.55	13.01	13.54	14.43	66.5%
	SPD	8.42	8.65	9.37	9.44	10.17	10.76	12.67	13.43	15.41	15.38	82.7%
	STK	7.95	8.63	9.33	9.44	9.92	10.32	11.21	11.32	13.41	12.68	59.5%
	NMH	7.15	7.33	7.30	6.98	7.01	7.40	8.06	10.77	11.78	12.55	75.4%
20-25	MDE	8.39	8.48	8.55	9.06	9.07	8.85	10.05	11.07	13.12	13.76	63.9%
	SPD	8.03	7.63	7.72	8.55	8.07	8.83	9.96	10.83	12.63	13.82	72.0%
	STK	5.97	6.41	6.16	6.68	6.85	7.00	7.91	8.49	9.43	10.92	83.0%
	NMH	8.59	7.95	8.01	8.18	7.94	8.66	8.12	9.57	11.30	12.50	45.5%
26+	MDE	7.69	7.42	7.25	7.45	7.36	7.03	7.23	7.24	7.57	7.24	-5.8%
	SPD	5.28	5.02	5.04	5.27	5.44	4.91	5.20	5.47	5.76	5.65	7.1%
	STK	4.27	4.02	3.84	3.87	3.93	3.78	3.95	4.02	4.08	4.13	-3.2%
	NMH	6.11	5.43	5.37	5.60	5.57	5.50	5.35	5.38	6.02	5.99	-1.9%

Abbreviation for outcomes:

MDE: major depressive episode in the past year, SPD: serious psychological distress in the past month, STK: seriously think about killing self in the past 12 months, and NMH: needed mental health treatment but did not get it in the past 12 months.

TABLE 2: Rate of major depressive episode by sex and race/ethnicity for adolescents (12-19 years)

Characteristics	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Change
Boys	5.11	4.54	4.68	5.31	5.18	5.86	6.47	6.66	7.31	8.28	62.1%
Girls	12.29	12.36	12.51	14.07	15.58	16.31	18.80	19.65	20.10	20.89	70.0%
White, non-Hispanic	8.86	8.62	9.10	9.73	10.96	11.55	13.16	14.00	14.38	15.32	73.0%
Black, non-Hispanic	6.92	6.94	6.76	7.92	7.65	8.55	8.56	8.72	9.23	9.83	42.2%
Hispanic	8.84	8.74	7.88	10.58	10.08	11.12	12.58	13.03	13.48	14.66	65.8%
Other	9.72	8.52	8.69	9.68	10.46	10.93	14.34	13.23	14.81	15.28	57.2%

The analysis of race/ethnicity groups showed an increasing trend of more cases of self-reported MDE for all groups. The trend was similar among White (non-Hispanic), Hispanic and Other groups (Figure 6), and these groups had higher percent of MDE than the Black (non-Hispanic) group.

## DISCUSSIONS

This study included data from a nationally representative datasets contributed by a large number (563,275) of participants over a 10-year period. There was a clear and consistent trend that the mental health condition for adolescents in the U.S. was worsening. This trend was in contrast to the 26+ age group, which showed very little or no change over the study period. Overall, the percent of adolescents with mental health conditions was about twice as high as the adults of 26+ years. Girls, in particular, require additional prevention and treatment programs as the percent with MDE among the girls was more than twice the percent of MDE among the boys of the same age group. These findings are consistent with those in published papers by

Twenge, et al. [1] and Park, et al. [2]. With respect to ethnicity, a study showed that White students with symptoms of depression were more than twice as likely as their Black counterparts to have received a prior diagnosis of depression, with mixed results for Hispanic students [6]. Additional research is needed to determine whether ethnic disparities are related to income, insurance status, and previous psychological treatment.

Multiple factors could contribute to the worsening mental health conditions among adolescents in the U.S. One of them is screen media. A study showed that children and adolescents who spent more time using screen media were lower in psychological well-being than low users. High users of screens were significantly more likely to display poor emotion regulation (not staying calm, arguing too much, being difficult to get along with), an inability to finish tasks, lower curiosity, and more difficulty making friends[7]. In Twenge’s paper [1], it was noted that cultural trends in the last 10 years may have had a larger effect on mood disorders and suicide-related outcomes among younger generations compared with older generations. The increased use of

electronic communication and digital media may have changed modes of social interaction enough to affect mood disorders. This may have had a bigger impact on adolescents because older adults' social lives are more stable. Older adults might also be less likely to use digital media in a way that interferes with sleep -- for example, they might be better at not staying up late on their phones or using them in the middle of the night. Indeed, additional analysis (data not shown) indicated that 99% of the adolescents who participated in the NSDUH survey in 2018 had access to a cell phone. Individuals who spend more time on social media and less time with others face-to-face reported lower well-being and are more likely to be depressed [8, 9]. Media influence can exacerbate the disparity between an adolescent's lived reality and their perceptions or aspirations for the future, in addition to affecting adolescents' sleep. Studies have shown that sleep duration among U.S. adolescents appears to be declining [10]. Thus, it is important to get enough sleep, and make sure the device use does not interfere with sleep and normal life.

Another factor that poses some adolescents at greater risk of mental health conditions is their living conditions, stigma, discrimination or exclusion, or lack of access to quality support and services. These include adolescents with chronic illness, autism spectrum disorder, an intellectual disability or other neurological condition; pregnant adolescents, adolescent parents, or those in early and/or forced marriages; orphans; and adolescents from minority ethnic or sexual backgrounds or other discriminated groups. In 2017, slightly less than 1 in 5 children lived in families with incomes below the federal poverty line, the lowest level since 2009 [11]. In this study, adolescents and young adults reported higher percent of needing mental health treatment but did not get it in the last year. Adolescents with mental health conditions are in turn particularly vulnerable to social exclusion, discrimination, stigma (affecting readiness to seek help), educational difficulties, risk-taking behaviors, physical ill-health and human rights violations. It is crucial to address the needs of adolescents with defined mental health conditions.

Other important factors affecting adolescents' mental health include the quality of their home life and relationships with peers. Violence (including harsh parenting and bullying) and socioeconomic problems are recognized risks to mental health. Children and adolescents are especially vulnerable to sexual violence, which has a clear association with detrimental mental health [2].

There are limitations to this study. First, the data are based on self-reports of mental health, and their value depends on respondents' willingness to report, truthfulness and memory. Although some experimental studies have established the validity of self-reported data in similar contexts and NSDUH procedures were designed to encourage honesty and recall, some underreporting and overreporting may take place. Second, individuals were interviewed only once and were not followed for additional interviews in subsequent years. Thus, this study did not show

changes in mental health for a fixed group of participants. However, major findings in this study are consistent with those in published papers, and the large volume of data over a long period of time are important for studying this important topic. The public access to the NSDUH data made it possible for many researchers to analyze, discuss, publish results and ideas, which will hopefully lead to better understanding of mental health conditions and, ultimately, the breaking down of barriers that inhibit adolescents' mental health.

## REFERENCES

- [1] Twenge JM, Cooper AB, Joiner TE, Duffy ME, Binau SG, Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. *Journal of Abnormal Psychology*, 2019, 128 (3), 185–199.
- [2] World Health Organization, website <https://www.who.int/en/news-room/detail/16-05-2017-more-than-1-2-million-adolescents-die-every-year-nearly-all-preventable>.
- [3] Park MJ, Scott JT, Adams SH, Brindis CD, and Irwin CE, Adolescent and young adult health in the United States in the past decade: little improvement and young adults remain worse off than adolescents, *Journal of Adolescent Health* 55 (2014) 3-16.
- [4] Sourander A, Koskelainen M, Niemela S, Rihko M, Ristkari T, Lindroos J, Changes in adolescents mental health and use of alcohol and tobacco: a 10-year time-trend study of Finnish adolescents, *Eur Child Adolesc Psychiatry* (2012) 21:665–671.
- [5] Substance Abuse and Mental Health Data Archive (SAMHDA), <https://datafiles.samhsa.gov/>
- [6] Thomas JF, Temple JR, Perez N, and Rupp R, Ethnic and Gender Disparities in Needed Adolescent Mental Health Care, *J Health Care Poor Underserved*. 2011, 22(1): 101–110
- [7] Twenge, JM, Campbell WK, Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a population-based study, *Preventive Medicine Reports*, 12 (2018), 271-283.
- [8] Lin, LY, Sidani, JE, Shensa A, Radovic A, Miller E, Colditz JB et al. (2016), Association between social media use and depression among U.S. young adults. *Depression and Anxiety*, 33, 323–331. <http://dx.doi.org/10.1002/da.22466>
- [9] Shakya HB, Christakis NA (2017). Association of Facebook use with compromised well-being: A longitudinal study. *American Journal of Epidemiology*, 185, 203–211. <http://dx.doi.org/10.1093/aje/kww189>
- [10] Twenge JM, Krizan Z, Hisler G (2017). Decreases in self-reported sleep duration among U.S. adolescents 2009–2015 and association with new media screen time. *Sleep Medicine*, 39, 47–53.
- [11] Child Trends Databank. (2019). *Children in poverty*. Available at: <https://www.childtrends.org/?indicators=children-in-poverty>