

# Depression and Anxiety among High School Students in the United States and China and its Relationship with Academic and Familial Satisfaction

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*Received June 2, 2025*

*Accepted September 14, 2025*

*Electronic access November 15, 2025*

This study examines the prevalence of depression and anxiety among high school students in the United States and China and explores their relationship with academic and familial satisfaction. Utilizing the PHQ-9 and GAD-7 clinical tools, alongside self-reported measures of academic and familial satisfaction, data were collected from 201 students (99 American, 102 Chinese). Results revealed that American students exhibited significantly higher levels of depression (effect size=1.374) and anxiety (effect size=1.216) compared to their Chinese counterparts. Depression and anxiety negatively correlated with both academic and familial satisfaction across both groups, though the strength of these relationships varied. Cultural factors, educational structures, and societal attitudes were discussed as influential in shaping these disparities. The study highlights the need for culturally sensitive approaches to addressing adolescent mental health and suggests promoting supportive academic environments and open familial communication as key strategies for mitigating mental health challenges among teenagers globally.

**Keywords:** Adolescent Mental Health, Depression, Anxiety, Cultural Differences, Academic and Familial Satisfaction

## Introduction

Mental health challenges among teenagers have become an increasingly prominent concern in recent years, particularly as rates of depression and anxiety continue to rise globally<sup>1</sup>. Adolescents are especially vulnerable to these mental health conditions due to the unique pressures and transitions they experience during this developmental stage, as the teenage brain undergoes substantial neurodevelopmental changes, making it more sensitive to emotional stimuli and less equipped to regulate stress due to the ongoing maturation of brain regions<sup>2</sup>. The impact of anxiety and depression on teenagers' wellbeing, academic performance, and social interactions underscores the importance of understanding the factors that contribute to their mental health. However, these factors are not necessarily universal and can be shaped by societal and cultural differences.

China and the United States serve as useful comparisons for studying adolescent mental health because of their distinct educational environments and cultural attitudes toward academic success. Chinese high schools are often characterized by their academic rigor and high levels of homogeneity, emphasizing standardized curriculums and intense study environments, which can place substantial pressure on students to excel academically<sup>3</sup>. The American educational system places weight on individuality and often provides more flexibility in educational paths, often allowing for students to explore a wider range of

extracurricular activities<sup>4</sup>. Nonetheless, the schooling system alone does not determine the mental and emotional wellness of students. In Western contexts, academic satisfaction and parental support are consistently found to correlate with adolescent mental health. Similarly, in collectivist contexts like China, literature emphasizes family resilience as a key protective factor mediating youth psychological outcomes: adolescents in families high in communication, emotional support, and adaptability demonstrated significantly fewer symptoms of depression or anxiety, even when controlling for personal strengths<sup>5</sup>.

Previous studies have suggested that adolescents in East Asian societies, including China, report elevated symptoms of depression and anxiety compared to their Western peers, potentially due to sustained academic pressure, stricter familial expectations, and cultural norms discouraging emotional expression<sup>6</sup>. In contrast, while American students face significant pressures related to college admissions, extracurricular commitments, and social media exposure, their educational environments tend to emphasize flexibility and individual expression, which may provide partial psychological buffers<sup>7</sup>.

Based on established scholarship, meaningful cultural differences in the prevalence and correlates of depression and anxiety between Chinese and American adolescents can be anticipated. It was hypothesized that Chinese high school students will report higher levels of depression and anxiety compared to their American counterparts. Furthermore, it was expected that lower levels

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of academic and familial satisfaction will correlate with higher symptoms of depression and anxiety in both groups, although the strength of these relationships may differ by culture.

To contextualize these dynamics, the study draws upon Bronfenbrenner's Ecological Systems Theory, which posits that adolescent development is shaped by interactions across nested environmental systems, including the microsystem (family, school), mesosystem (interactions between school and family), exosystem (parental work environments or policy), macrosystem (cultural values), and chronosystem (historical context). This model is particularly useful for cross-cultural comparisons, as it highlights how broader societal and cultural structures influence individual psychological outcomes<sup>8</sup>. In this study, familial satisfaction and academic experiences are considered within the microsystem, while cultural values around education and emotional expression form part of the macrosystem. This theoretical lens helps explain how differing societal structures in the U.S. and China may result in divergent adolescent mental health profiles, even when individual stressors (e.g., academic expectations) appear similar.

## Methods

A sample of students was recruited from both countries; due to time and resource limitations, only one region was selected from each country based on feasibility of data collection. The participating students were recruited from average-sized, public high schools in both countries. These schools were selected based on accessibility and administrative approval, but also because they reflect typical educational environments rather than elite or highly specialized institutions. The American high school was located in an urban region with access to standard public school resources. Comparably, the Chinese high school was situated in an urban area and followed the national public school curriculum. Data collection was conducted on an ordinary school day that was not immediately before or after a major school break (e.g., national holiday) or close to high-stakes academic assessments such as midterms, finals, or university entrance exams. This timing was intentional to avoid capturing temporary spikes in stress or mood that may not reflect students' usual mental health status. To reduce confounding variables related to gender and socioeconomic status, the participant sample was balanced such that the male-to-female ratio did not differ significantly, with only a 1.3% difference. All participants were 11th grade students planning on attending college, ensuring consistency in academic tracks and developmental stages. Furthermore, the samples came from middle to low income families. In the U.S., "middle-income" is defined as households earning two-thirds to double the national median income, and "lower-income" as below two-thirds of that median (e.g., roughly \$38,900 to \$116,800 annually for a three-person household in 2019–2020)<sup>9</sup>. In China, based on definitions by the National Bureau of Statistics and

related research, per-capita household income in the middle-income range falls between RMB 100,000 and 500,000 annually (approx. USD 14,800–74,200), with lower-income households earning below that threshold<sup>10</sup>.

Consent was obtained from all participants and their parents (if under 18). The consent form included detailed information about the study's purpose, procedures, potential risks, confidentiality, and students' rights to withdraw at any time without consequence; parents were informed that their child will be asked to complete a mental health screening questionnaire and brief academic and personal satisfaction items.

Students then completed an anonymous questionnaire that included two standardized clinical tools: the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7). Both of these tools are commonly used in medical and psychological settings to assess depression and anxiety, respectively, and have been validated for use with adolescent populations<sup>11,12</sup>. Although PHQ-9 and GAD-7 originate from Western clinical frameworks, both have been translated, culturally adapted, and validated in Chinese adolescent samples. For instance, the PHQ-9 has demonstrated strong internal consistency, test-retest reliability  $> 0.80$ , and high diagnostic accuracy in Chinese youth settings<sup>13</sup>. The GAD-7 likewise showed robust reliability in a large Shenzhen adolescent sample, and measurement invariance studies confirm its construct validity across Chinese and non-Chinese groups, although scalar invariance is partial, indicating caution in comparing absolute mean scores between cultures<sup>14</sup>. These validations support our use of the PHQ-9 and GAD-7, albeit with culturally appropriate cutoffs and critical interpretation. For the Chinese students in this study, officially translated versions of the PHQ-9 and GAD-7 were provided to prevent language barriers and ensure accurate responses. The PHQ-9, which measures depression severity, has a total score ranging from 0 to 27, while the GAD-7, which evaluates anxiety symptoms, has a total score ranging from 0 to 21, providing a quantitative measure of anxiety and depression levels in the sample. Students scoring in the moderate to severe range on either PHQ-9 or GAD-7 (a score  $> 9$ ) saw a pop-up message encouraging them to seek support; they were then immediately provided with a list of local resources and hotlines. A debriefing sheet was provided to all students at the end of the survey explaining what the scores mean, how to seek help, and resources available.

In addition to the PHQ-9 and GAD-7, the students were also asked to report on their self-perceived relationship with their parents and their satisfaction with their academic performance on a scale ranging from 1 to 5, with 1 being extremely unsatisfactory and 5 being extremely satisfactory. These additional factors allow for a broader understanding of how personal and environmental variables may influence mental health outcomes between the two cultural contexts.

## Results

A total of 201 participants were recruited for this study, consisting of 99 American high schoolers and 102 Chinese high schoolers.

In terms of depression, the mean score for American students was 8.837 with a median of 8, while those of Chinese students revealed significantly smaller values of 2.569 and 1. The range of scores obtained across the American and Chinese students appears to be similar, 22 and 24, respectively. The standard deviation for American students was 5.169, reflecting greater variability compared to 3.863 for Chinese students. The 95% confidence interval for American students was [7.292,10.382], indicating a broader range of possible mean values, while that of Chinese students was [1.819,3.319], offering a more precise estimate of their mean depression score (Table 1). Furthermore, the t-test revealed a statistically significant difference in depression levels between the two groups, with a t-value of 8.041 and p-value less than 0.05. This suggests that the observed difference in depression scores is unlikely to have occurred by chance and that the data is statistically significant. Effect sizes were also calculated to assess the magnitude of the differences. Cohen's d for depression was 1.374, indicating a large effect size, which means that the difference in depression levels between American and Chinese students is substantial (Table 3).

**Table 1** Mean, median, range, standard deviation, and 95% confidence interval of depression levels among American and Chinese participants

	American	Chinese
Mean	8.837	2.569
Median	8	1
Range	22	24
Standard Deviation	5.168	3.863
95% CI	[7.292,10.382]	[1.819,3.319]

Regarding anxiety, American students again reported higher levels, with a mean score of 7.767 compared to 2.549 for Chinese students. The median anxiety score for American students was 7, while Chinese students had a median score of 1, which further supports the trend of higher anxiety among American students. The range of anxiety scores was similar for both groups, with American students showing a range of 20 and Chinese students a range of 19. The standard deviation for American students was 4.775, indicating more variability in anxiety levels, while Chinese students had a lower value of 3.778. The 95% confidence interval for American students was [6.34,9.194], suggesting a broader uncertainty in the mean estimate, while the confidence interval for Chinese students was [1.816,3.282] (Table 2). The t-test produced a t-value of 7.007 with a p-value less than 0.05, indicating a significant difference between the two groups in terms of anxiety and proving statistical significance.

Additionally, Cohen's d was calculated to be 1.216, which is a large effect size, suggesting that the difference between American and Chinese students is highly pronounced (Table 3).

**Table 2** Mean, median, range, standard deviation, and 95% confidence interval of anxiety levels among American and Chinese participants

	American	Chinese
Mean	7.767	2.549
Median	7	1
Range	20	19
Standard Deviation	4.775	3.778
95% CI	[6.34,9.194]	[1.816,3.282]

**Table 3** t-value and Cohen's d of depression and anxiety levels among American and Chinese participants

	Depression	Anxiety
t-value	8.041	7.007
Cohen's d (Effect Size)	1.374	1.216

The analysis also included Pearson's correlation coefficients to explore the relationship between depression and anxiety levels in both groups, as well as their connection to other factors such as academic satisfaction and familial satisfaction, measured on a scale of 1 to 5. For both American and Chinese students, depression showed a weak to moderate negative correlation with academic satisfaction (−0.435 and −0.137, respectively), meaning that higher levels of depression are associated with lower satisfaction in school performance. Depression also had a moderate negative correlation among American students with familial satisfaction (−0.444), as well as Chinese students (−0.377), indicating that more depressive symptoms are linked to lower levels of satisfaction with familial relationships. These observed trends also apply to anxiety levels across both groups. Anxiety in American students was moderately negatively correlated with academic satisfaction (−0.291) and familial satisfaction (−0.335); anxiety in Chinese students showed a weaker negative correlation with academic satisfaction (−0.117) and parent satisfaction (−0.221). These values suggest that depression and anxiety are related to academic and familial satisfaction (Table 4).

Furthermore, incorporating significance testing into the correlation analysis revealed important distinctions in the strength and reliability of observed relationships. Among American students, all correlations between depression/anxiety and both academic and familial satisfaction were statistically significant ( $p < 0.01$ ), with moderate negative associations and relatively narrow confidence intervals. For example, depression was significantly negatively correlated with academic satisfaction ( $r = -0.435$ , 95% CI [−0.582, −0.260],  $p < 0.0001$ ) and

familial satisfaction ( $r = -0.444$ , 95% CI  $[-0.590, -0.270]$ ,  $p < 0.0001$ ). Anxiety also showed significant negative correlations with academic ( $r = -0.291$ , 95% CI  $[-0.462, -0.099]$ ,  $p = 0.0035$ ) and familial satisfaction ( $r = -0.335$ , 95% CI  $[-0.499, -0.147]$ ,  $p = 0.0007$ ). In contrast, among Chinese students, only the correlation between depression and familial satisfaction ( $r = -0.377$ , 95% CI  $[-0.532, -0.197]$ ,  $p = 0.0001$ ) and between anxiety and familial satisfaction ( $r = -0.221$ , 95% CI  $[-0.398, -0.028]$ ,  $p = 0.0256$ ) reached statistical significance. Correlations between mental health symptoms and academic satisfaction in the Chinese group were weaker and not statistically significant, with wide confidence intervals crossing zero, indicating a lack of robust association (e.g., depression and academic satisfaction:  $r = -0.137$ , 95% CI  $[-0.323, 0.059]$ ,  $p = 0.1697$ ). These results suggest that while familial satisfaction is significantly linked to mental health in both cultural groups, the connection between academic satisfaction and mental health appears more pronounced and reliable in the American sample.

## Discussion

The findings from this study reveal significant differences in the levels of anxiety and depression between American and Chinese high school students, indicating that cultural, societal, and environmental factors likely play a role in shaping these disparities. Contrary to the original hypothesis, which anticipated higher depression and anxiety scores among Chinese students, the results showed that American students reported significantly higher levels of both depression and anxiety. These findings potentially suggest that students in the U.S. may face unique psychological burdens, possibly stemming from social comparison, fragmented educational support systems, or the broader normalization of mental health disclosure, that contribute to their higher symptom levels<sup>15</sup>.

The observed trend can also be attributed to the difference in course rigor across grade levels in America and China. In the U.S., high school students often experience a significant increase in academic rigor compared to their earlier schooling years. In elementary and middle school, the focus is generally in foundational schools and exploration, with less pressure to excel academically. The surge in academic pressure in high school, along with the added stress of extracurricular activities, standardized testing, and college admissions, can overwhelm students, contributing to heightened levels of anxiety and depression<sup>16</sup>. Research found that students' grades often decline sharply from eighth to ninth grade, highlighting the academic challenges associated with this transition<sup>17</sup>. On the other hand, Chinese schools are known for their rigorous academic structure from elementary education. The educational system places a strong emphasis on discipline, hard work, and high academic standards, which are instilled from early childhood<sup>18</sup>. This

consistent level of academic intensity across all school years potentially helps students develop the resilience needed to handle academic pressure. Because the pressure is a long-term, consistent experience, it may be less likely for high school students to produce the high-scoring results in tests such as the PHQ-9 and GAD-7 seen in American students, who relatively abruptly transition to a more demanding academic environment.

Despite Chinese students reporting lower levels of depression and anxiety, the numbers may not necessarily reflect a healthier mental state. From the perspective of Bronfenbrenner's Ecological Systems Theory, these findings could reflect how the macrosystem, encompassing cultural norms and attitudes toward mental health, interacts with the microsystem (family and school) to shape adolescents' willingness to disclose emotional distress. In Chinese culture, mental illness is often associated with shame, moral failure, and a loss of "face," leading individuals to conceal symptoms to protect family honor and social standing<sup>19</sup>. This cultural emphasis on emotional restraint and collectivism can result in somatization, where psychological distress manifests as physical symptoms like headaches or fatigue, further complicating accurate reporting<sup>20</sup>. As a result, the lower reported levels could reflect underreporting rather than an absence of mental health concerns. This contrast highlights the importance of considering cultural context when assessing mental health, as Chinese students may underreport their struggles due to societal expectations, while American students may be more forthcoming in discussing their emotional difficulties.

Furthermore, a growing body of anthropology and psychology underscores the contrasting expectations surrounding adolescent emotion between Western and East Asian contexts. Research using the Emotion Regulation Implicit Association Test (ER-IAT) found that Chinese participants implicitly and explicitly valued emotional expression less than European Americans, reflecting cultural norms that frame overt emotion as socially disruptive. Neurophysiological and self-report studies further reveal that European Americans are encouraged to express emotional states, whereas Asian individuals are socialized to suppress expression in order to maintain relational harmony and interdependence. For example, in suppression tasks, European Americans showed elevated physiological arousal inconsistent with inward emotional states—highlighting a cultural conflict between the impulse to express and the need to suppress—whereas Asian participants showed more congruence with their internal state, indicating cultural and neural habituation to suppression strategies<sup>21</sup>.

The second part of the hypothesis, that lower academic and familial satisfaction would be associated with higher depression and anxiety symptoms, was partially supported. Satisfaction with academics and family demonstrated meaningful associations with mental health, but the strength and significance of these relationships varied between the two cultural groups. In the American sample, both academic and familial satisfaction

**Table 4** Pearson’s correlation coefficient of academic and familial satisfaction (reported on a scale of 1-5) among American (A) and Chinese (C) participants and its 95% confidence interval and p-value

		Depression (A)	Depression (C)	Anxiety (A)	Anxiety (C)
Academic Satisfaction	<i>r</i>	−0.435	−0.137	−0.291	−0.117
	95% CI	[−0.582, −0.260]	[−0.323, 0.059]	[−0.462, −0.099]	[−0.305, 0.079]
	<i>p</i>	< 0.0001	0.1697	0.0035	0.2416
Familial Satisfaction	<i>r</i>	−0.444	−0.377	−0.335	−0.221
	95% CI	[−0.590, −0.270]	[−0.532, −0.197]	[−0.499, −0.147]	[−0.398, −0.028]
	<i>p</i>	< 0.0001	0.0001	0.0007	0.0256

were significantly negatively correlated with symptoms of depression and anxiety, indicating that lower satisfaction in these domains was reliably associated with worse mental health outcomes. In contrast, among Chinese students, only familial satisfaction showed a statistically significant negative correlation with depression and anxiety. The associations between academic satisfaction and mental health, while directionally negative, were weak and did not reach statistical significance. These findings suggest that familial support may be a more salient protective factor for Chinese students’ mental health than academic self-appraisal, or that academic dissatisfaction is less likely to be emotionally internalized or openly acknowledged due to cultural norms<sup>22</sup>. Importantly, the observed associations do not imply causality, and it remains unclear whether dissatisfaction contributes to mental health symptoms or whether existing symptoms reduce students’ perceived satisfaction. Nonetheless, the stronger and statistically robust associations in the American group point to potentially greater emotional salience or openness in evaluating academic and familial stressors in that context.

The patterns observed in this study echo and diverge from previous research examining cross-cultural adolescent mental health. For instance, Chen et al. (2021) found that Chinese high school students, compared to their American peers, reported lower academic anxiety but higher somatic and mood-related depressive symptoms, despite comparable academic performance. This is consistent with our finding that Chinese students reported lower anxiety and depression scores, but it raises the possibility of underreporting or alternative symptom expression<sup>23</sup>. Additionally, studies by Jiang et al. have shown that academic stress in Chinese adolescents predicts depression indirectly via school burnout and is moderated by self-esteem, indicating that internal factors may mediate the mental health impact of academic dissatisfaction. This offers a potential explanation for the weaker correlation between academic satisfaction and depressive symptoms observed in the Chinese sample in the study<sup>24</sup>. These findings collectively suggest that cultural norms may buffer or mask the emotional salience of academic satisfaction among Chinese students, leading to weaker statistical associations when measured via self-report tools.

In light of the findings, both the U.S. and China should adopt targeted, culturally sensitive strategies to address adolescent

mental health. For the U.S., where depression and anxiety levels are significantly higher and more closely tied to academic and familial dissatisfaction, schools should embed routine mental health screenings, expand access to counseling services, and train educators to identify and respond to emotional distress. Interventions should also focus on promoting academic environments that balance rigor with autonomy and well-being, while encouraging open communication within families. In China, where mental health symptoms may be underreported due to stigma and emotional restraint, efforts should prioritize destigmatization campaigns and integrate psychosocial education into school curricula. Since familial satisfaction emerged as a stronger predictor of mental health in both cultures, policies should support family engagement programs that foster emotional support, adaptability, and trust.

Moreover, this study has limitations. First, the sample sizes between American and Chinese students were slightly imbalanced, with more participants from China, which may have influenced the comparative results. Second, the study relied exclusively on self-reported questionnaires, which are subject to response biases such as social desirability or underreporting, particularly in cultures where mental health stigma remains strong. Third, the participants were recruited from only one geographic region in each country, limiting the generalizability of the findings to broader national populations. Regional socioeconomic factors, school environments, and local cultural norms could differ within each country. Finally, as mental health can vary over time, a one-time survey limits the ability to detect such fluctuations. A future longitudinal or time-lag design—in which students are surveyed multiple times across different academic periods—would provide a more dynamic understanding of how academic cycles, social factors, or seasonal shifts influence adolescent mental health.

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