

# Depression Level Comparison: Chinese Undergraduate International Students in the United States and Local Undergraduate Students in Mainland China Two Years After COVID-19 Outbreak

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**Abstract.** Chinese international students have become the biggest population among international students studying in the United States since decade ago. Meanwhile, the number of Chinese undergraduate students are also increasing rapidly. The question of whether these two populations' depression level has deference has been proposed. The study result indicates that Chinese International undergraduate students have a higher depression level than Chinese undergraduate students studying in mainland China.

**Keywords:** Chinese international students; Chinese undergraduate students; Depression level; Depressive symptoms.

## 1. Introduction

China is the world's second largest economy in the world today. As China's economy grows, Chinese undergraduate students' numbers are also increasing rapidly. Chinese undergraduate students have increased 525,500 between the year of 2020 and the year of 2019 [11]. Meanwhile, Chinese International Students have become the largest group among all the international students studying in the United States. In the year 2020, there were 317,299 Chinese international students studying in the United States [13]. This is almost one third of the total international students who are studying in the US. The psychological wealth of this population has become extremely important.

A lot of studies have been done regarding the depression level of Chinese international students and local Chinese students. The overall prevalence of depression symptoms among Chinese was 40.1% during the COVID-19 pandemic [14]. Studies also indicate that Chinese students in Yale have a 45% prevalence of depression symptoms [5]. Both samples showed a very high prevalence of depression symptoms among Chinese students under a stressful environment. Lots of studies have been done regarding the prevalence of depression symptoms among Chinese students. Although they face similar academic challenges, Chinese international students are facing more obstacles than students in mainland China are encountering. Chinese international students need to face barriers such as cultural distance, cultural shock, language barrier, and so on [3]. Cultural distance is an important barrier which Chinese international students need to encounter. As research describes "On the other hand, femininity cultures, according to Redmond [8], emphasize the importance of relationships, caring for the weak, and the quality of life [8], cultural distance could potentially lead to the prevalence of depression symptoms. Depression linked with culture shock is extremely severe in the United States due to the prevailing individualism. ". . . the predicted probability of MDE among immigrants was about 6% when the source-country individualism score was about 10 (e.g. similar to Colombia's score of 13), . . . However, at the upper end of the scale (starting around a score of 40) the probability of MDE increased with higher levels of individualism. The estimated probability of MDE among immigrants was 14% when the source-country individualism score was 90 (e.g. 91 for the US)" [4]. Language barriers are also an important problem that Chinese international students need to overcome. The proficiency of English is also linked with the possibility of the prevalence of depression. "According to Mori (2000), the lack of English language skills is likely to affect international students' academic and social performances, which, in turn, may affect their psychological adjustment to the new culture (p. 138)" [7]. Chinese international students are also more vulnerable to depression due to acculturative stress and maladaptive perfectionism [9].

COVID-19 pandemic caused a negative impact on Chinese university students. According to research, “over one fourth of Chinese university students experienced depressive symptoms during the COVID-19 pandemic” [6]. Chinese international students are facing a more severe impact of COVID-19. After the breakout of COVID-19 pandemic, hate crimes toward Asian communities have excessively increased. According to data from the Federal Bureau of Investigation (FBI) released in August 2021, the hate crime cases toward Asians have increased by 77% in the year of 2020. Under such circumstances, the Chinese international undergraduate students’ mental health conditions have impacted dramatically. Research indicates that one year after COVID-19 breakout, Chinese international students “reported greater depression and anxiety” due to the pandemic and discrimination related to it “while at low level (below 1 SD) of perceived social support there existed a significantly positive association between discrimination and depression” [1]. In addition, Chinese international students “exhibited significantly great levels of anxiety [1].

Though lots of research has been done regarding the depression symptoms prevalence of Chinese students in Chinese colleges and Chinese international students, little is known regarding to what extent Chinese students in Chinese colleges and Chinese international students are experiencing these symptoms differently. This population is large and yet ignored. Chinese international students are far away from their family and thus more likely to be ignored even with symptoms of depression. Thus, this research is designed to fill the gap of the depression level difference between Chinese international undergraduate students and undergraduate students in Chinese universities. Regarding all the different barriers Chinese international students need to encounter, it is reasonable to hypothesize that international students are going to have a higher depression level than students in Chinese colleges.

## 2. Method

### 2.1 Study Design

This study was conducted as an online anonymous survey of Chinese students studying in Chinese universities and Chinese students studying in United States universities. This is a study which is designed to determine whether Chinese international undergraduate students have a higher depressive level. Due to the fact that this is a one time anonymous questionnaire, this is a cross-sectional study.

### 2.2 Participants

This questionnaire was sent through Chinese social media WeChat to 57 Chinese undergraduate students ( $n=57$ ). 59.65% of the participants are Chinese students studying in United States’ universities ( $n=34$ ), 40.35% of the participants are Chinese students studying in Chinese universities ( $n=23$ ). 19.30% of participants are freshmen students ( $n=11$ ), 10.53% of participants are sophomore students ( $n=6$ ), the same proportion of junior students, and 59.65% of them are senior students ( $n=34$ ). Though 12.28% of the participants have been diagnosed with depressive disorder ( $n=7$ ), this study only analyzes changes in depression symptom changes, thus these participants are also included in the study.

For participants who are studying in Chinese universities, the questionnaire was originally sent to undergraduate students who are studying in universities in Tianjin, Kunming, and Guangzhou. These three cities are largely apart geographically, and original participants are sending the questionnaire to their friends. The participants are randomly recruited from here. For Chinese International student participants, the questionnaire was originally sent to undergraduate students who are studying in universities New York, Pennsylvania, and California which are also largely apart cities geographically. These students are sending the questionnaire out to their friends to distribute the questionnaire. The participants are randomly recruited from here. Though the sample size for this study is relatively small, the participants are recruited from a large scale geographically, hence these samples are representative of Chinese students studying in Chinese universities and Chinese international students studying in United States’ universities.

## 2.3 Data Collection & Variables

This research uses an online questionnaire to collect data. The online questionnaire was distributed by researchers and participants through WeChat. Depression symptom levels were measured by Beck's Depression Inventory [2] which contains 21 questions regarding depression symptoms. Each question contains one symptom based on diagnosis criteria and there are four answers depending on severity scores from 0 to 3 points. Participants were asked to answer these 21 questions according to their past 6 months' experiences. Additional three questions were added by researchers to collect whether participants are studying in China or the United States, which school year participant is, and whether the participant has been diagnosed with depression disorder.

## 2.4 Data Analysis

A t-test will be performed in this experiment to draw the conclusion whether Chinese international undergraduate students have a higher depression level than Chinese undergraduate students studying in Chinese universities. The result will be given by the mean of the sum of BDI scores of both populations. This will also give us the p-value of the experiment.

## 3. Result

### 3.1 Participants

There are 40.35% Chinese local undergraduate students (n=23) among total of 57 participants and 59.65% of the participants are Chinese international undergraduate students (n=34). 19.30% of the participants are freshman students (n=11), 10.53% of the participants are sophomore students (n=6), the same number applies to junior students, and 59.65% of the participants are senior students (n=34). 87.72% of the participants have not been diagnosed with depression disorder by clinics (n=50) before the study, and 12.28% of the participants have been diagnosed with depression disorder by clinics (n=7) before the study.

### 3.2 Beck's Depression Inventory Score

This study is meant to use t-test to determine whether Chinese international undergraduate students studying in the United States have a higher depression level than Chinese local undergraduate students. The BDI scores are presented in the table one. The research result shows that depressive level was higher for Chinese undergraduate students studying in the United States (mean = 11.0, s.d. = 12) than depressive level for Chinese undergraduate students studying in mainland China (mean = 6.3, s.d. = 8). Plot 2 shows the mean difference between two groups of participants. The t-test indicates that there is a statistical significant difference between this two populations ( $t(56) = 1.8$ ,  $p = 0.041$ ). Thus, the research result indicates that Chinese undergraduate students studying in American universities have a higher depression level than Chinese undergraduate students who are studying in Chinese universities. This result supports research hypothesis which is Chinese international undergraduate students studying in the United States have a higher depression level than Chinese local undergraduate students. For participants who have been diagnosed with depressive disorder and participants who have not diagnosed with depressive disorder, the BDI score are slightly different. The BDI score for participants diagnosed with depressive disorder and undiagnosed participants are shown in the plot 3. Research result suggests that participants who have been diagnosed with depressive disorder (mean = 9.1, s.d. = 8) have a slightly higher depression level than participants who have not been diagnosed with depressive disorder (mean = 9.1, s.d. = 11). However, the t-test indicates that this result is statistical insignificant ( $t(56) = 0.05$ ,  $p = 0.49$ ).

Table 1. Mean and Standard deviation for BDI Scores

	M	SD
Students in China	6.26	7.881
Students in the U. S	11	12.103

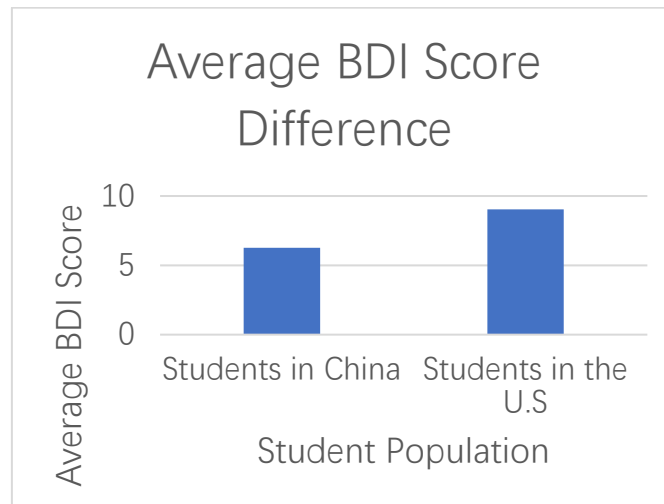


Fig. 1 Average BDI Score Difference

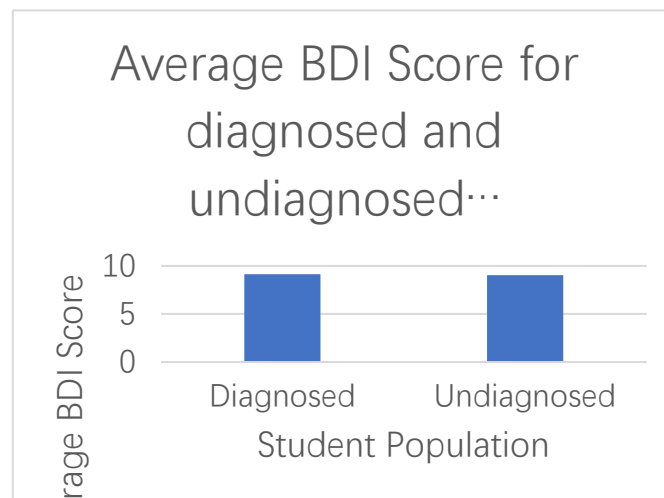


Fig. 2. Average BDI Score for diagnosed and undiagnosed participants

#### 4. Summary

The result of the study suggests that Chinese international undergraduate students studying in the United States universities have a higher depression level than Chinese undergraduate students studying in Chinese universities. The mean of 11.0 in international population and 6.3 in local population shows a significant difference between two populations. The research hypothesis which is Chinese international undergraduate students are going to have a higher depression level than Chinese local undergraduate students is also supported by this result. Like mentioned above, international students are experiencing more stressors than local students. This might attribute to the higher score of depression symptoms. This research also correlates to the previous research which shows that in a country with a higher individualism score, immigrants are more likely to show depressive symptoms [4].

The large population of Chinese undergraduate international students' mental health problems should not be neglected. Chinese undergraduate students came from a less psychologically educated environment and faced large pressures such as cultural shock. It is important for public to increase education on this population.

Though it is expected that international students might have a higher depression score than local students, it is surprising that those of who have already been diagnosed with depressive disorder are not showing a significant higher BDI score than those who have not been diagnosed with depressive disorder before. This is probably due to the small sample size the study has collected.

#### 4.1 Strengths

Though this study has a small sample size, samples are collected from a large demographic scale. These samples are representative of the different students in different areas of the two countries. Schools and environments are also differentiated by this large demographic scale. Students from different areas of the world also experience different stressors or factors that would cause depressive symptoms.

#### 4.2 Limitations

The study was conducted as a self-report questionnaire online, thus it is difficult for the researchers to conduct a strictly rigorous test of depression levels of Chinese undergraduate students. Though it was an anonymous questionnaire, because talking about sex-related topics might still make participants to be uncomfortable. Therefore, to assess whether participants' sexual desires have been decreased in past three months is likely to be biased. This study also does not able to answer what factors or stressors caused international undergraduate students have a higher level of depressive symptoms.

#### 4.3 Future Studies

Though this study suggests that Chinese international undergraduate students have a higher depression level, the question of what caused this problem remained unknown. Does the significant difference between Chinese international undergraduate students' BDI score and Chinese local undergraduate students' BDI score suggest that Chinese international undergraduate students are facing more stressors and pressures from the environment and society remains unknown. However, the significant higher BDI score of international students indicates that the society needs to pay more attention to this population. Both Chinese policy makers and the United States policy makers should consider this problem.

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