

Original Paper

Psychological Impacts of the COVID-19 Outbreak on Chinese International Students: Examining Prevalence and Associated Factors

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Funding

This research did not receive any specific grant from funding agencies in any public, commercial, or not-for-profit sectors.

Received: June 24, 2020

Accepted: July 15, 2020

Online Published: July 22, 2020

doi:10.22158/wjer.v7n3p45

URL: <http://dx.doi.org/10.22158/wjer.v7n3p45>

Abstract

Background: *As the international community has grappled to bring the corona virus disease 2019 (COVID-19) under control, many social factors have emerged and unbearable pressure has been placed on us all. This study aimed to explore the psychological symptoms and influencing factors of the pandemic on Chinese international students.*

Method: *Post-Traumatic Stress Disorder (PTSD) symptoms and other psychological symptoms were investigated using the PTSD Checklist Civilian Version (PCL-C) and the Depression, Anxiety, Stress Scale-21 (DASS-21). Demographic data and data pertaining to the impact of COVID-19 on Chinese international students was also collected.*

Result: *Chinese international students in their fourth year of university education showed higher depressive symptoms, anxiety symptoms, and stress symptoms than students in other years of their*

students in high school than for students in their first and second years of university education. Chinese international students who were abroad were found to be most anxious about the risk of infection, financial stress, and travel restrictions following the COVID-19 outbreak.

Conclusion: *Our study suggest that the effect of COVID-19 on Chinese international students' psychological symptoms are significant. Our results are valuable for legislators and healthcare*

providers, who may need to develop effective psychological interventions for Chinese international students.

Keywords

international students, COVID-19, Post-traumatic stress disorder, DASS-21, psychological symptom

1. Introduction

At present, almost every country in the world is experiencing conditions created by the ongoing COVID-19 pandemic. Humankind's contact with this severe acute respiratory syndrome, also known as corona virus 2 (SARS-CoV2), will have both immediate and long-term consequences, not only within medicine and economics, but also in domains of culture, education, etc. The outbreak of this epidemic has not only brought with it the risk of death from viral infection, but has also brought serious psychological pressure to global populations. Negative impacts from either nature or human could lead to the worsening of mental state, which could further result in conditions such as Post-Traumatic Stress Disorder (PTSD) and other psychological symptoms (Kopala-Sibley et al., 2016; Plexousakis, Kourkoutas, Giovazolias, Chatira, & Nikolopoulos, 2019; Schwartz et al., 2019).

There have been reports on the psychological impact the current epidemic has had on the general public, including patients, medical staff, children, and older adults. However, few detailed studies on the mental health status of Chinese international students facing this epidemic have been conducted to date (Chen et al., 2020; Xiao, Zhang, Kong, Li, & Yang, 2020). During the post COVID-19 period, travel restrictions, strict isolation measures and delays in returning to schools, colleges, and universities across the country are expected to influence the mental health of college students (Duan & Zhu, 2020; Xiao, 2020; Cao, 2020). Many countries in which a great number of Chinese students are pursuing their academic studies have announced travel restrictions for foreign nationals to avoid the spread of the epidemic. Of the international Chinese students, 86% expressed a desire to fly back to China, while half of these students stated that they were not able to because of flight shortages or the unaffordable costs.

Meanwhile, Chinese international students who were abroad have faced unfair treatments and were discriminated in some countries, because they were being viewed as possible COVID-19 carriers. This misconception is what causes public fear, alienation, and discrimination, which may also lead to mental health problems, such as denial, stress, anxiety, and fear (Kang et al., 2020; King, Cabarkapa, Leow, & Ng, 2020). In addition, during the post COVID-19 period, UNESCO estimated that the shutdown of educational institutions due to the epidemic had impacted half of the students around the world – 890 million students in 114 countries. Globally, universities have faced uncertainty as to how long the corona virus crisis will last and how the post COVID-19 period might affect the mental health of students and faculty members.

A large portion of Chinese international students were unable to commence courses this year, coupled with anxiety surrounding their studies and visa status. Many of these international students were from

families of the middle class that handmade large financial sacrifices for their children's education overseas. Poor academic performance could also lead to stress and anxiety. Moreover, international students also need to deal with numerous challenges stemming from linguistic and cultural barriers. Furthermore, the difference between medical systems of different countries may be confusing and students may be limited by language barriers and stigma. Arranging interpreters for every clinical appointment can be challenging and many students who need to pay the whole fee do not have access to adequate healthcare. Therefore, it is necessary to address the potential mental health problems of Chinese international students and their access to appropriate services, particularly during the post COVID-19 era. This study aims to gain a better understanding of the prevalence of PTSD and the associated factors of psychological symptoms amongst Chinese international students to inform the development of potential interventions for improving their mental health and well-being during the post-epidemic period.

2. Methods

2.1 Participants and Procedure

The questionnaires were collected between May 10 and June 5 among 500 Chinese international students. In order to ensure the validity of our results, it was emphasized that participation was voluntary and students were given verbal and written reassurance that their responses would not be available to their program directors. All the questionnaires consisted of two parts and were completed anonymously. The first part of the questionnaire contained questions about demographics, living conditions, health conditions, exposure to the COVID-19, and the impact of COVID-19 on Chinese international students' daily life and learning. The second part of the questionnaire contained questions about the Depression Anxiety Stress Scale (*DASS-21*) and Post-Traumatic Stress Disorder (PTSD). Of the 500 students, 324 completed the survey; the response rate was 64.8%. All individuals provided written informed consent and ethical approval for the study was granted by the ethics committee.

2.2 Measurements

2.2.1 Depression, Anxiety, and Stress (*DASS-21*)

This 21-item short scale allows for the simultaneous assessment of the three emotional states of depression, anxiety, and stress. It is easy to apply in both clinical and non-clinical settings and suitable for use in different age groups (Vignola & Tucci, 2014). Each item has a four-point Likert scale, which respondents use to provide a rating. The rating choices are "not applicable" (0 points), "some degree/some of the time" (1 point), "considerable degree/a good part of time" (2 points), and "very much/ most of the time" (3 points). For Depression, the criteria were normal (0-9 points), mild (10-13 points), moderate (14-20 points), severe (21-27 points), and extremely severe (28+ points). For Anxiety, the criteria were normal (0-7 points), mild (8-9 points), moderate (10-14 points), severe (15-19 points), and extremely severe (20+ points). For Stress, the criteria were normal (0-14 points), mild (15-18 points), moderate (19-25 points), severe (26-33 points), and extremely severe (34+ points). Each

subscale's score is the doubled sum of the seven items (Lovibond & Lovibond, 1995).

2.2.2 PTSD Check List-Civilian Version (PCL-C)

PTSD was assessed by the PTSD Check List—Civilian Version (PCL-C). The PCL-C is a 17-item self-report that can be used for PTSD screening, diagnosis, or symptom monitoring. Developed by Weathers and his colleagues (Weathers et al., 1991) the civilian version of the PCL-C can be applied generally to any traumatic event and can be easily modified to fit specific time frames or events. It is self-administered and requires respondents to rate how often they have been bothered by PTSD symptoms using a 5-point scale (from 1=not at all to 5=extremely). The total score can range between 17 and 85. Scores of 38 or higher indicate severe PTSD (Dobie et al., 2002; Harrington and Newman, 2007). The PCL-C has been shown to be valid and reliable, and is available for use with a Chinese sample (Jin et al., 2014).

2.3 Statistical Analysis

SPSS 20.0 statistical software (SPSS, Inc, Chicago, IL, USA) was used for this study's data analysis. A Chi-square test was used to analyze the categorical data of the Chinese international students. Comparisons between two groups were performed using an independent-samples Student's t-test, in which a two-tailed p value of $<.05$ was considered statistically significant.

3. Results

3.1 Demographic Characteristics

In total, 324 Chinese international students completed the questionnaire. However, 110 of these were eliminated from the study owing to illogical answers, such as submitting the same answers to all questions, or reporting zero at each instance. Therefore, 214 participants' questionnaires were used in the analysis; these respondents consisted of 106 females and 108 males. In total, 57.9% of them were 16-19 years old, 34.6% were 20-23 years old, and only 7.5% were 24-27 years old. Most of these Chinese international students were in their first year of university (35%) and 25.2% were in high school. Most of the participants had no siblings (72.4%) and 47.2% of them moved back to China owing to the COVID-19 pandemic. The demographic characteristics are shown in Table 1.

Table 1. Demographic Characteristics of Chinese International Students

| | N | % |
|------------------------|-----|------|
| Age | | |
| 16-19 years old | 124 | 57.9 |
| 20-23 years old | 74 | 34.6 |
| 24-27 years old | 16 | 7.5 |
| Gender | | |
| Female | 106 | 49.5 |

| | | |
|---|-----|------|
| Male | 108 | 50.5 |
| Have siblings or not | | |
| Yes | 155 | 72.4 |
| No | 59 | 27.6 |
| Grade | | |
| High school | 54 | 25.2 |
| 1st year (freshman) | 75 | 35.0 |
| 2nd year (sophomore) | 23 | 10.7 |
| 3rd year (junior) | 24 | 11.2 |
| 4th year (senior) | 26 | 12.1 |
| Others | 12 | 5.6 |
| Place of residence | | |
| China | 101 | 47.2 |
| Abroad | 113 | 52.8 |
| Impact of COVID-19 on social activities | | |
| Mostly Positive | 66 | 30.8 |
| Mostly Depressive | 84 | 39.3 |
| No impact | 33 | 15.4 |
| Unclear | 31 | 14.5 |
| Impact of COVID-19 on academics | | |
| positive | 64 | 29.9 |
| depressive | 79 | 36.9 |
| No impact | 35 | 16.4 |
| unclear | 36 | 16.8 |
| The center of anxiety during the COVID-19 | | |
| Signing up for the tests (SAT, TOEFL) | 32 | 15.0 |
| Preparing to apply for colleges | 35 | 16.4 |
| Graduate | 76 | 35.5 |
| Other | 71 | 33.2 |
| Sleep duration per night | | |
| < 6 hours | 34 | 15.9 |
| 6-7 hours | 60 | 28.0 |

| | | | | |
|------------------------------|--------------------------|----------------------|------------------------|----------------------|
| 7-8 hours | 53 | | 24.8 | |
| 8-9 hours | 31 | | 14.5 | |
| 9-10 hours | 24 | | 11.2 | |
| > 10 hours | 12 | | 5.6 | |
| Exposure to the COVID-19 | Chinese | international | Chinese | international |
| | students in China | | students abroad | |
| | N | % | N | % |
| Living in the worst-hit area | | | | |
| Yes | 18 | 17.8 | 28 | 24.8 |
| No | 83 | 82.2 | 85 | 75.2 |
| Extremely scared | | | | |
| Yes | 21 | 20.8 | 35 | 31.0 |
| No | 80 | 79.2 | 78 | 69.0 |

3.2 The Effect of COVID-19 on Chinese International Students' Learning and Life Conditions

As shown in Table 1, 24.8% of the 52.8% of Chinese international students living abroad reported that they were living in the heavily affected areas areas and 31% reported that they were extremely scared. Most of the participants reported experiencing depressive symptoms, as well as a decrease of daily social activities (39.3%) under the impact of the COVID-19. While 36.9% of participants reported that they were unhappy about their academic studies, 35.5% of them indicated worry as to whether they would be able to graduate on time. Furthermore, most of the participants reported that they were sleeping only 6-7 hours per night. As shown in Figure 1, there were numerous sources of anxiety for international students who had returned to China, including delays in returning to school due to COVID-19 and worries concerning course schedules, assignments, and seminars which could not be completed on time. For Chinese international students who were still abroad, sources of anxiety included their inability to return to China due to COVID-19 travel restrictions and worry surrounding the risk of infection and limited financial resources.

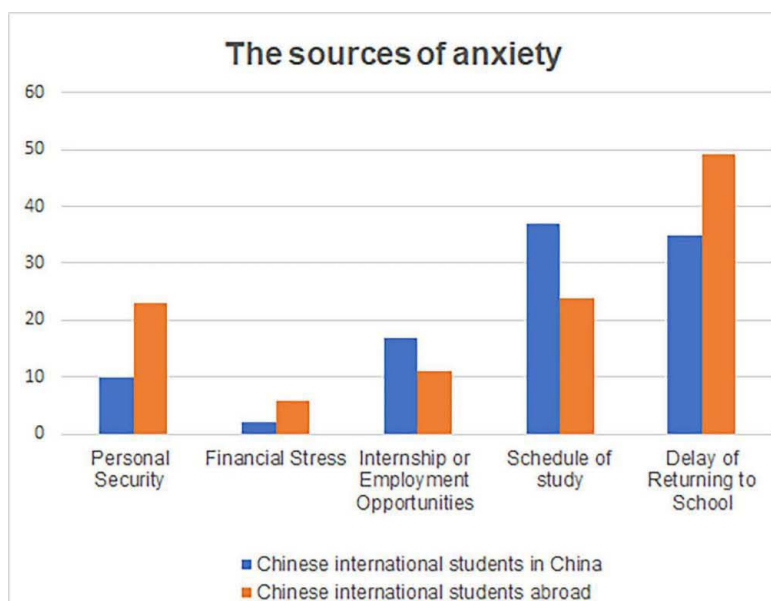
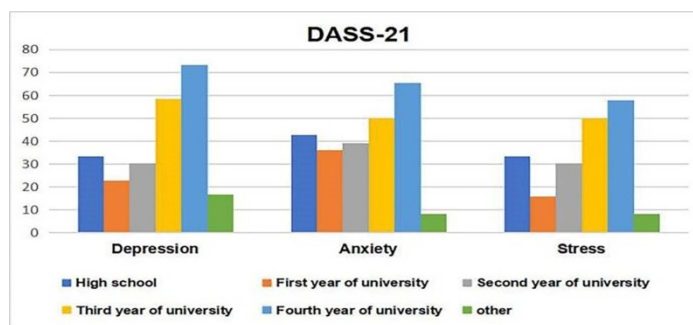


Figure 1. The Comparison of Different Sources of Anxiety things between the Chinese International Students in China and the Chinese International Students Abroad

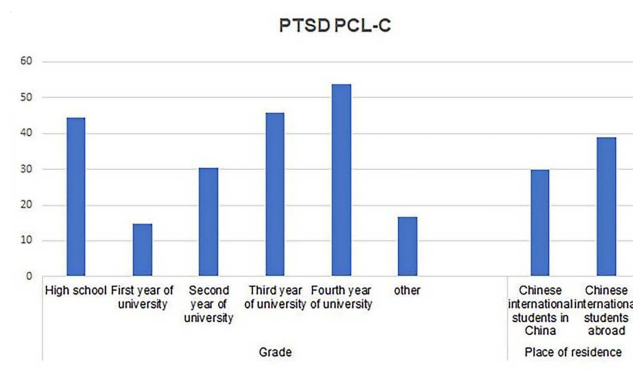
3.3 Comparative Analysis of the PCL-C and the DASS-21 Stratified by Living Area and Different Grades

As shown in Figure 2, there were significant differences with regard to the proportion of depression score > 9 , anxiety score > 7 , and stress score > 14 , as assessed by the DASS-21 ($P < 0.001$, $P = 0.013$, $P < 0.001$, respectively). Chinese international students in their fourth year of university education showed higher depressive symptoms (73.1%), anxiety symptoms (65.4%), and stress symptoms (57.7%) than students in other years of university. The second highest numbers of psychological symptoms were displayed by students in their third year of university education. Each psychological symptom of Chinese international students in high school was found to be higher than for students in their first and second years of university education but lower than for students in their third and fourth years of university education. As shown in Figure 3, the proportion of mean PCL-C scores above 38 for those who were in their final year of university is higher than for those who were in other years of their university programs ($P < 0.001$). Additionally, the mean PCL-C scores in students who remained abroad after the outbreak of the COVID-19 was higher than for those who returned to China ($t = -2.088$, $P < 0.001$).



(A)

Figure 2. DASS-21 Scores and PTSD PCL-C among Chinese International Students (A) the Percentage of Depression Score>9, the Percentage of Anxiety Score>7 and the Percentage of Stress Score>14 among different Grades of Chinese International Students



(B)

Figure 3. DASS-21 Scores and PTSD PCL-C among Chinese International Students. (B) The Percentage of PTSD PCL-C Score≥ 38 among different Grades of Chinese International Students and Among Different Places of Residence

4. Discussion

This study evaluated the current living situations, PTSD, and psychological symptoms of Chinese international students after the COVID-19 outbreak and identified related risk factors. We found that the COVID-19 epidemic had corresponding impacts on a variety of aspects, such as Chinese international students’ daily lives and learning conditions. The psychological symptoms and PTSD of Chinese international students in their third and fourth years of university education was more severe than among those in their first and second years of university education. Moreover, high school graduates who were about to study abroad also showed high levels of psychological symptoms and PTSD. Both Chinese international students who were in China and abroad indicated that they were

experiencing anxiety, and the PTSD amongst students living abroad was more serious than that seen in students who had returned to China.

According to UNESCO's monitoring, as the post COVID-19 era approached, more than 160 countries applied national closures, which influenced more than 87% of the world's student population. Several other countries have applied localized school closures, and millions of other students will experience educational disruption if these closures become nationwide (UNESCO, 2020). The post COVID-19 period has cancelled many conferences and sports events, and also replaced institutional classroom-based learning with online sessions. Colleges are being forced to come up with large-scale preventive measures so that students and professors could stay healthy, not to mention the need of creating plans for when infections materialize on campus.

Attending online classes is now a new routine for many students, yet it also presents significant challenges. Not all learners have been given access to this kind of education due to the social inequality that exists in many nations (FVG, 2020). In our study, we found that only 30.8% of Chinese international students preferred to take courses online, while most of them showed an opposing or indifferent attitude to these new forms of learning. Furthermore, according to experts the lethal SARS-CoV-2 will remain influential in global higher education even after the outbreak has been controlled. In the areas most impacted, university students might miss an entire semester or even more (The World University Rankings, 2020).

Current evidence shows that students in poor financial conditions are likely to receive more harm. Nearly half of community college students and about a third of fourth-year college and university students are already facing insecurity, fear, a sense of loss, and mood swings related to the schedule of their studies, whether they will graduate on time, and internship arrangements (The Hechinger, 2020; Tang et al., 2020). In our study, in regard to the prevalence of depression, anxiety, and stress, Chinese international students in their third and fourth years of university education showed higher levels of psychological symptoms than students in other years of university. Additionally, each psychological symptom among Chinese international students in high school was higher than that of students in their first and second years of university education, but lower than that of students in their third and fourth years of university education. The proportion of mean PCL-C scores above 38 for those who were in their final year of university after the outbreak of the COVID-19 was higher for those who were in other years of their university programs.

Currently, efforts made in response to the crisis by the Chinese government have been swift. In an unprecedented move to slow the spread of the virus, China imposed travel restrictions on overseas returnees. The air travel restrictions that suspended flights made to the U.S. by Chinese passenger airlines would take effect on June 16 or earlier. This restriction posed a dilemma for Chinese international students who were abroad or in China. In our study, the proportion of mean PCL-C scores above 38 in those who were abroad were shown to be higher than the mean scores of those who were already in China. The possible reasons for this may be as follows. First, university students may be

under-immunised (Kumar et al., 2005), have frequent close interpersonal contact (Wilson & Huttlinger, 2010; Palin & Greer, 2012), and/or may be unaware of increased risks of infection; all of these are uncertainties which may have increased the Chinese international students' stress. More serious infections of Corona virus may also be carried by international students, which could potentially be spread to other students. Second, due to the particularities of medical systems in foreign countries, it is difficult and expensive for international students to get medical treatment abroad. Additionally, an increase in racial discrimination against people of an Asian background has been observed. This may also be damaging to Chinese international students' mental health, their sense of belonging, and self-esteem, and thus may aggravate their PTSD.

This survey found that 31% of the Chinese international students who were abroad reported that they were extremely scared about COVID-19, and 24.8% of Chinese international students who were abroad reported that they were living in heavily affected areas. These proportions were all higher than those of the Chinese international students who stayed in China. Not surprisingly, Chinese international students abroad were more worried about the risk of infection than students who stayed in China. Chinese international students who came from middle class families, or worked alongside their studies abroad, may have experienced less financial pressure to a certain extent. However, the close down of many shops and restaurants due to the outbreak of the COVID-19 had been causing anxiety surrounded the economic situation of the nation they were residing in.

Proactive interventions are required in order to lessen the losses for international students in the post COVID-19 era. Experiences of discrimination can lead to poorer mental health, and therefore public awareness around infection prevention should be delivered in a culturally sensitive and evidence-based manner. First, a walk-in triage system could assist university counselling centers in differentiating urgent problems from more routine problems (Shaffer et al., 2017). Meanwhile, the triage coordinator is required to be aware of international Chinese students' specific mental health concerns involving COVID-19 and be able to teach Chinese international students about how to discuss their conflicts, depressed mood, and dissatisfaction in order to reduce their psychological pressure. Second, free counselling services provided by trainee clinics might also ease anxiety amongst Chinese international students with distress (Lauka et al., 2014). Third, university and school departments such as student affairs, international programs, and student health centers should stand together to support students with infection by advocating for non-discrimination and coordinating the response to the crisis.

5. Limitation

This study had several limitations. First, as the study was focused on Chinese international students, the results may not be applicable to other adults or to the general population. Second, the personality types and coping styles of different participants were not measured in this study, yet these may have had an influence on the results. Third, due to the constant changes that are taking place in terms of both the

crisis and the international relations surrounding it, our research is only representative of the mental status of Chinese international students in the time period during which this study was conducted.

6. Conclusions

The Chinese international students who were in a higher grade of their studies suffered more serious psychological symptoms than those who were in a lower grade during the post COVID-19 epidemic period. Furthermore, the Chinese international students who remained abroad seemed to be more anxious about the risk of infection than those who returned to China. The results of this study could assist health practitioners in identifying Chinese international students with an elevated risk of mental health problems, so that they can be targeted for appropriate mental health interventions. It is likely that universities need to consider planning for acute and long-term psychological symptoms in their students and ensuring there are services in place to help students struggling to cope, which might include graduating seniors and those living in hardest hit areas.

Authorship contribution statement:

Yilin Zhao: Investigation, Writing original draft, Formal analysis, Data curation, Project administration.

Acknowledgments

The authors would like to thank Yun Shao, MD, Ph.D., from the Department of Psychology in Shengjing Hospital of China Medical University, in Shenyang, China for his contribution to this study. An additional thank you to the Northeast Yucui Oxford International Senior High School (NYO) and STF International English Training School for their help in our study.

References

- Abdullah, A. S. A. M., Hedley, A. J., & Fielding, R. (2000). Prevalence of travel related illness amongst a group of Chinese undergraduate students in Hong Kong. *Journal of travel medicine*, 7(3), 125-132. <https://doi.org/10.2310/7060.2000.00043>
- Abdullah, A. S., McGhee, S. M., & Hedley, A. J. (2001). Health risks during travel: A population-based study amongst the Hong Kong Chinese. *Annals of tropical medicine and parasitology*, 95(1), 105-110. <https://doi.org/10.1080/00034983.2001.11813620>
- Bao, Y., Sun, Y., Meng, S., Shi, J., & Lu, L. (2020). 2019-nCoV epidemic: Address mental health care to empower society. *Lancet (London, England)*, 395(10224), e37-e38. [https://doi.org/10.1016/S0140-6736\(20\)30309-3](https://doi.org/10.1016/S0140-6736(20)30309-3)
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res*, 287, 112934. <https://doi.org/10.1016/j.psychres.2020.112934>

- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., & Zhang, Z. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *The lancet. Psychiatry*, 7(4), e15-e16. [https://doi.org/10.1016/S2215-0366\(20\)30078-X](https://doi.org/10.1016/S2215-0366(20)30078-X)
- Dobie, D. J., Kivlahan, D. R., Maynard, C., Bush, K. R., McFall, M., Epler, A. J., & Bradley, K. A. (2002). Screening for post-traumatic stress disorder in female Veteran's Affairs patients: Validation of the PTSD checklist. *General hospital psychiatry*, 24(6), 367-374. [https://doi.org/10.1016/S0163-8343\(02\)00207-4](https://doi.org/10.1016/S0163-8343(02)00207-4)
- Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *The lancet. Psychiatry*, 7(4), 300-302. [https://doi.org/10.1016/S2215-0366\(20\)30073-0](https://doi.org/10.1016/S2215-0366(20)30073-0)
- FVG. (2020). *Webinar discusses education challenges during corona virus pandemic*. Retrieved from <https://portal.fgv.br/en/news/webinar-discusses-education-challenges-duringcoronavirus-pandemic>
- Harrington, T., & Newman, E. (2007). The psychometric utility of two self-report measures of PTSD among women substance users. *Addictive behaviors*, 32(12), 2788-2798. <https://doi.org/10.1016/j.addbeh.2007.04.016>
- Hawryluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S., & Styra, R. (2004). SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging infectious diseases*, 10(7), 1206-1212. <https://doi.org/10.3201/eid1007.030703>
- Jin, Y., Xu, J., Liu, H., & Liu, D. (2014). Posttraumatic stress disorder and posttraumatic growth among adult survivors of Wenchuan earthquake after 1 year: Prevalence and correlates. *Archives of psychiatric nursing*, 28(1), 67-73. <https://doi.org/10.1016/j.apnu.2013.10.010>
- Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, L., Wang, G., Ma, H., & Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel corona virus. *The lancet. Psychiatry*, 7(3), e14. [https://doi.org/10.1016/S2215-0366\(20\)30047-X](https://doi.org/10.1016/S2215-0366(20)30047-X)
- King, J. A., Cabarkapa, S., Leow, F., & Ng, C. (2020). Addressing international student mental health during COVID-19: An imperative overdue. *Australas Psychiatry*, 19(5). <https://doi.org/10.1177/1039856220926934>
- Kopala-Sibley, D. C., Danzig, A. P., Kotov, R., Bromet, E. J., Carlson, G. A., Olino, T. M., Bhatia, V., Black, S. R., & Klein, D. N. (2016). Negative emotionality and its facets moderate the effects of exposure to Hurricane Sandy on children's postdisaster depression and anxiety symptoms. *Journal of abnormal psychology*, 125(4), 471-481. <https://doi.org/10.1037/abn0000152>
- Kumar, A., Murray, D. L., & Havlichek, D. H. (2005). Immunizations for the college student: A campus perspective of an outbreak and national and international considerations. *Pediatric clinics of North America*, 52(1), 229-xi. <https://doi.org/10.1016/j.pcl.2004.10.009>
- Lauka, J. D., McCarthy, A. K., & Carter, D. A. (2014). A national survey on counseling training clinics in CACREP-accredited programs. *Journal of Counseling in Illinois*, 3, 5-16.

- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, 33(3), 335-343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- Mihashi, M., Otsubo, Y., Yinjuan, X., Nagatomi, K., Hoshiko, M., & Ishitake, T. (2009). Predictive factors of psychological disorder development during recovery following SARS outbreak. *Health psychology: Official journal of the Division of Health Psychology. American Psychological Association*, 28(1), 91-100. <https://doi.org/10.1037/a0013674>
- Mubarak, A., Alturaiki, W., & Hemida, M. G. (2019). Middle East Respiratory Syndrome Corona virus (MERS-CoV): Infection, Immunological Response, and Vaccine Development. *Journal of immunology research*, 6491738. <https://doi.org/10.1155/2019/6491738>
- Palin, K., & Greer, M. L. (2012). The effect of mixing events on the dynamics of pH1N1 outbreaks at small residential colleges. *Journal of American college health: J of ACH*, 60(6), 485-489. <https://doi.org/10.1080/07448481.2012.696294>
- Pan, X., Ojcius, D. M., Gao, T., Li, Z., Pan, C., & Pan, C. (2020). Lessons learned from the 2019-nCoV epidemic on prevention of future infectious diseases. *Microbes and infection*, 22(2), 86-91. <https://doi.org/10.1016/j.micinf.2020.02.004>
- Plexousakis, S. S., Kourkoutas, E., Giovazolias, T., Chatira, K., & Nikolopoulos, D. (2019). School Bullying and Post-traumatic Stress Disorder Symptoms: The Role of Parental Bonding. *Frontiers in public health*, 7, 75. <https://doi.org/10.3389/fpubh.2019.00075>
- Schwartz, R. M., Rasul, R., Gargano, L. M., Lieberman-Cribbin, W., Brackbill, R. M., & Taioli, E. (2019). Examining Associations Between Hurricane Sandy Exposure and Posttraumatic Stress Disorder by Community of Residence. *Journal of traumatic stress*, 32(5), 677-687. <https://doi.org/10.1002/jts.22445>
- Shaffer, K. S., Love, M. M., Chapman, K. M., Horn, A. J., Haak, P. P., & Shen, C. Y. W. (2016). Walk-In Triage Systems in University Counseling Centers. *Journal of College Student Psychotherapy*, 31(1), 71-89. <https://doi.org/10.1080/87568225.2016.1254005>
- Tang, W., Hu, T., Hu, B., Jin, C., Wang, G., Xie, C., Chen, S., & Xu, J. (2020). Prevalence and correlates of PTSD and depressive symptoms one month after the outbreak of the COVID-19 epidemic in a sample of home-quarantined Chinese university students. *J Affect Disord*, 274, 1-7. <https://doi.org/10.1016/j.jad.2020.05.009>
- The Hechinger. (2020). *Tears, confusion and financial woes as colleges abruptly end semesters and send students home.* Retrieved from <https://hechingerreport.org/tears-confusion-andfinancial-woes-as-colleges-abruptly-end-semesters-and-send-students-home>
- The World University Rankings. (2020). *Universities brace for lasting impact of corona virus outbreak.* Retrieved from

- <https://www.timeshighereducation.com/news/universities-brace-lastingimpact-coronavirus-outbreak>
- UNESCO. (2020). *COVID-19 educational disruption and response*.
<https://en.unesco.org/themes/education-emergencies/coronavirus-school-closures>
- Vignola, R. C., & Tucci, A. M. (2014). Adaptation and validation of the depression, anxiety and stress scale (DASS) to Brazilian Portuguese. *Journal of affective disorders, 155*, 104-109.
<https://doi.org/10.1016/j.jad.2013.10.031>
- Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel corona virus outbreak of global health concern. *Lancet (London, England), 395*(10223), 470-473.
[https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9)
- Weathers, F., Huska, J., & Keane, T. (1991). *PTSD Checklist (PCL)*. Washington, DC: National Center for PTSD, US Department of Veterans Affairs.
- Wilson, S. L., & Huttlinger, K. (2010). Pandemic flu knowledge among dormitory housed university students: a need for informal social support and social networking strategies. *Rural and remote health, 10*(4), 1526.
- Xiao, C. (2020). A Novel Approach of Consultation on 2019 Novel Coronavirus (COVID-19)-Related Psychological and Mental Problems: Structured Letter Therapy. *Psychiatry investigation, 17*(2), 175-176. <https://doi.org/10.30773/pi.2020.0047>
- Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). The Effects of Social Support on Sleep Quality of Medical Staff Treating Patients with Corona virus Disease 2019 (COVID-19) in January and February 2020 in China. *Med Sci Monit, 26*, e923549.
<https://doi.org/10.12659/MSM.923921>