



Psychological Impacts of the COVID-19 Pandemic Lockdown on International Medical Students: A Cross-sectional Study in China

Mohammed ALGerafi^{1*}, Wenlan Zhang¹, Tram Huynh To²

¹ School of Education, Shaanxi Normal University, Xi'an, CHINA.

² Faculty of Odontostomatology, Hong Bang International University, Ho Chi Minh, VIETNAM.

*Corresponding Author (Email: malgerafi@gmail.com).

Paper ID: 12A10N

Volume 12 Issue 10

Received 30 April 2021

Received in revised form 19

July 2021

Accepted 24 July 2021

Available online 05 August
2021

Keywords:

COVID-19 lockdown;
International students;
Lockdown burnout;
Medical education;
Psychology; Feeling
stress; Feeling isolation;
Oldenburg Burnout
Inventory (OLBI).

Abstract

Lockdown to control the spread of the COVID-19 crisis has resulted in various psychological effects on humans. Medical students may have been particularly affected by the lockdown due to many disturbances in their daily lives and education. The primary objective of this study was to assess the academic burnout status and its relationship with other factors among international medical students in China during the COVID-19 pandemic lockdown. This was an online-based cross-sectional study using a self-administrated questionnaire conducted from February-August 2020 in China when the lockdown took place and all Chinese medical schools shifted toward electronic learning. A total of 407 eligible respondents were analyzed. Almost all students were clustered above the descriptive cut-off for both exhaustion (405/407) and disengagement (368/407) dimensions. The overall burnout was significantly associated with the academic attitude, feeling of isolation, and stress. This study suggests that international medical students may suffer from psychological distress and negative academic attitude due to higher feelings of isolation and greater levels of stress during the COVID-19 pandemic lockdown. It is recommended that actions are needed to be taken to reduce the psychological impact of the lockdown, thereby supporting the students' well-being and education.

Disciplinary: Medical Education, Psychology.

©2021 INT TRANS J ENG MANAG SCI TECH.

Cite This Article:

ALGerafi, M., Zhang, W., Huynh To, T. (2021). Psychological Impacts of the COVID-19 Pandemic Lockdown on International Medical Students: A Cross-sectional Study in China. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 12(10), 12A10N, 1-10. <http://TUENGR.COM/V12/12A10N.pdf> DOI: 10.14456/ITJEMAST.2021.203

1 Introduction

It is widely anticipated that the COVID-19 pandemic is going to have a long-lasting effect on the psychology of all humans, worldwide. However, as the pandemic is still ongoing, it is

exceedingly difficult to predict and assess the range and the severity of this psychological burden. Although the western world was taken by surprise, considering pandemics a problem of the past or of underdeveloped countries, Asia had its share of pandemics, before SARS-COV2 appeared. Multidrug-resistant malaria in 2013 (Amato et al., 2018), yellow fever in 2016 (Wilder-Smith et al., 2019), the Zika outbreak in 2018 (Yadav et al., 2019) have made Asian countries painfully aware of how suddenly they appear and how easily they spread.

As one of the pioneers in response to the COVID-19 crisis, China has suspended in-person classes and switched to electronic learning several times since mid-February 2020. Obviously, medical schools have been no exception. Considering the temporary closure of medical schools during the lockdown, medical students may have been particularly affected. They must cope with the sudden changes in curriculum and the rapid shift toward online education. Senior students may be further impacted because of the cancellation of clinical exposure (Nishimura et al., 2021). Moreover, the social distancing among students may have also affected their psychological state since the academic years are considered to be the most impactful in a person's life (Brouwer & Jansen, 2019). Therefore, medical students may feel less supported both academically and socially (Aftab et al., 2021).

China has emerged as an educational hub for international students for years. During the crisis, international students may feel worse than local attendees do, as the change of country generally leads to a totally different cultural background that the person has experienced thus far. Under the pandemic lockdown, international students may perceive themselves as far away from their families, friends, academic environment, and other social relationships, possibly resulting in psychological distress. Indeed, social support is reported to enhance academic goals and reduce emotional exhaustion among undergraduate students in China (Li et al., 2018). Summing up all these issues, it is important to maintain the psychological well-being of international medical students with effective approaches to support their wellness and education. Herein, our study presents the psychological impact of the lockdown during the COVID-19 pandemic on international students pursuing their education in medical schools in China and attempts to predict whether the social environment can affect them personally and academically.

The present report is based on a prospective cross-sectional study conducted with an online questionnaire, during the ongoing COVID-19 pandemic lockdown in China (spring semester February – August 2020), when all medical schools introduced e-learning as the only way of continuing their courses. Chinese Medical Schools have a 5-year curriculum with an additional year of clinical internship. The clinical specialization covers a 2-3 years' master's degree.

International students, at all Medical Schools, in China, including MBBS (Bachelor of Medicine and Bachelor of Surgery), Dentistry, and Pharmacology, were the target of our study. Around 40,000 expat students are estimated to be currently studying in the Chinese Medical Schools, countrywide. We calculated that a minimum of 381 correctly completed questionnaires was needed for a statistically valid representation of our target group (Cardinale et al., 2011).

Our research team developed the questionnaire through consultation with a medical education expert and tried it out through a pilot study on 30 students. The amended version was posted, for four weeks, on the WeChat platform that is widely used by medical students in China. Concurrently, it was published in the university groups of each university by local medical students and the snowball sampling method was used to reach the largest number of respondents and increase participation. The survey was terminated when the predesignated number was reached.

The questionnaire consisted of three main domains. The first comprised the demographics of the participants, namely, age, gender, country of origin, country of residence, living and social conditions. In particular, the cohabitation conditions and the social bubble of each student were determined. Moreover, a short self-assessment of their personality (introvert/extrovert) was also included. The pillar provides the framework within which the students are expected to perform and adapt.

The second pillar measured the burnout factor using the Oldenburg Burnout Inventory (OLBI), a useful tool that has been used previously for academic burnout in medical students and residents (Tipa, R.O et al 2019). Disengagement items are 1, 3(R), 6(R), 7, 9(R), 11(R), 13, 15. Exhaustion items are 2(R), 4(R), 5, 8(R), 10, 12(R), 14, 16. (R) means reversed item when the scores should be such that higher scores indicate more burnout.

Finally, the third domain comprised assessment of the student's attitude towards their studies, their teachers, and their future was also assessed. The sum of the corresponding replies was categorized as an educational attitude and stress scores, respectively. The pillar is correlated with the psychological impact on educational progress.

The overall stress score is the sum of questions scores pertaining to their feeling of isolation and uncertainty towards the perceived situation. The questions for each section are presented in Supplementary tables S1-S5. Domains 2, and 3 were structured positively and assessed in a five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). Therefore, a total score for each domain was calculated as the sum of the individual statement.

Data analysis was performed using Jamovi 1.27 statistical software. Initial descriptive analysis revealed that data do not follow a normal distribution pattern, therefore appropriate tests for parametric and non-parametric variables were selected. Cronbach's alpha coefficient was calculated in all entities.

2 Result

Four hundred twelve students completed the questionnaire, and five were excluded because they fell outside the pre-set parameters (e.g., they were taking only language classes, or were studying in non-medical disciplines).

Therefore, the following data represent 407 students, aged 18-43 (mean 26.5 ± 5.01); males were 248 (63.39%), females 159 (36.61%). These represent approximately 10% (407/40,000) of the international medical students in China (Li & Sun, 2019), thus a representative sample of the target population (confidence level 5%). The response rate was 100%, as there was a rigorous follow-up.

Participants originated from all continents, but understandably most come from Asia (70.27%) and then Africa (24.82%) (Table 1). This trend coincides with the distribution of students (Asian students 59.95% and African students 16.57%) from the official data (Ministry of Education of the People’s Republic of China, 2019). The older the students, thus being in the clinical years, the more likely it was to reside in China during the pandemic ($p < .001$). The social bubble consisted of more than 4 persons (mean 4.68) with the older students having fewer people around them, but not statistically different from juniors ($p = 0.084$).

Out of the undergraduate students (158, 38.82%), most of them (57.59%) were in the preclinical years (1-3 years), while the rest were in the latter years (37.34%). Almost half of the students (55.61%) were residing in China during the pandemic, while the rest (44.39%) were back in their home countries. Most of the students (88.45%) lived with someone else, either their family (51.35%) or at a university dormitory (28.75%), or shared a house (8.35%), while only a few lived alone (11.55%) (Table 1).

Table 1. Demographic data of participants

	No	%
Gender	407	
Male	248	63.39
Female	159	36.61
Continent of Origin	407	
Asia	286	70.27
Africa	101	24.82
Europe	10	2.46
America	7	1.72
Oceania	3	0.74
Dwelling arrangements*	407	
Alone	47	11.55
Family	209	51.35
Shared housing	34	8.35
University Dormitory	117	28.75
Place of Residence*	407	
China	226	55.61
Outside of China	181	44.39
Number of people in a social bubble (Mean, SD)	4.48 (2.98)	
Junior	4.81	p=0.084
Senior	4.08	

* Place of residence during the lockdown period

The continent of origin (Africa, America, Asia, Europe, or Oceania) does not seem to affect any of the parameters measured. Similarly, the personality traits (introvert/extrovert) do not seem to have any impact on the scales used (data not shown).

Table 2. alpha Cronbach coefficient for internal consistency

Component	No of questions	Alpha Cronbach coefficient
Attitude score	10	0.700
Overall stress	11	0.625
OLBI-exhaustion	8	0.732
OLBI-disengagement	8	0.791
OLBI- total	16	0.892

Firstly, the alpha Cronbach coefficient was calculated for all subdomains (Table 2). The stress score is rather low ($\alpha=0.625$), most likely due to the heterogeneity of the stressing factors assessed. All conclusions will take this into account. The effect of binary parameters was assessed by t-test and the results are presented in Table 3. In summary, gender correlates with age (male students tend to be older, $p=0.002$) most likely because they pursued higher degrees; older students (seniors) also tend to have a smaller social circle ($p=0.056$) while not statistically significant.

Table 3. t-test p-value for binary parameters

	gender	residence	Senior/junior
Age	0.002*	<0.001*	0.011*
Social Bubble	0.470	0.968	0.056
Year in medical school	0.623	0.003*	<0.001
Professors did their best	0.764	0.009*	0.959
Professors rose to challenge	0.147	0.029*	0.641
Attitude score	0.569	<0.001*	0.384
Overall stress score	0.625	0.866	0.534
OLBI-Exh	0.350	0.370	0.530
OLBI-dis	0.100	0.015*	0.243
OLBI-total	0.120	0.050*	0.280
I/E score	0.932	0.689	0.268

*Levene test is significant ($p<.05$), suggesting a violation of the assumption of equal variances

Residence (in or outside China) seemed to affect greatly most parameters of our study. Students outside China judged more harshly their professors ($p=0.009$ and $p=0.029$), had a more negative attitude towards their studies ($p<0.001$), and exhibited a higher OLBI dissociation ($p=0.015$) and overall score ($p=0.050$.) (Table 3).

Table 4. one way ANOVA p-value for non-binary parameters

	dwelling	degree
Age	0.208	<.001*
Social Bubble	0.090	0.050
Year in medical school	0.064	<.001*
Professors did their best	0.005*	0.791
Professors rose to challenge	0.014*	0.188
Attitude score	<.001*	<.001*
Overall stress score	0.026*	0.519
OLBI-Exh	0.332	0.199
OLBI-dis	0.256	0.841
OLBI-total	0.179	0.457
I/E score	0.388	0.089

The analysis of the non-binary nonparametric factors, with one-way ANOVA, is shown in Table 4. Dwelling conditions (alone, shared household, university dorm, family) show an impact on factors such as attitude towards the professors ($p=0.005$ and $p=0.014$), the general academic attitude ($p<0.001$), and overall stress ($p=0.026$). More specifically, people living within their family or at a university dormitory were more favorable towards their teacher than those living alone. Reversibly those living alone or within university dormitories have a higher academic affinity.

The degree level (BSc, PhD, Master) affects obviously the age and the year in medical school, as well as the academic attitude ($p<0.001$). The higher the degree level the more satisfied the students. The less satisfied were those in Bachelor, mostly because some of the students got no

experience of live classroom teaching. These students may also have had less opportunity to expand their social bubble, as they had the least people identified as a social bubble.

3 Discussion

This study presents a comprehensive overview of the mental and psychological state of international students, in medical schools of China, during the COVID-19 pandemic. Burnout was measured in connection to the living situation, the social bubble, the social dissociation, the feeling of stress. Academic performance was also assessed regarding the above-mentioned parameters.

In our study, the feelings of exhaustion and dissociation do not seem to associate significantly with the stress levels and the feeling of isolation. These associations have been reported in the past for the academic community, and especially the medical school students, even before the pandemic. The phenomenon has been well documented across the globe from first- to third-world countries (Ezenwaji et al., 2019; Rudinskaitė et al., 2020). Burnout is the psychological manifestation of chronic stress and is usually linked to substance and alcohol abuse, even suicidal ideation, in extreme cases (Talih et al., 2018).

The most important parameter that appears to relate to both the academic attitude and the attitude towards the instructors, seems to be the residence of the students. The students living overseas seem to be more dissociated from studies and are more critical towards their teachers. The residence location can account for discontent as living away from the university can give rise to technical issues of distant learning (e.g., internet connection, time difference, etc.), which have been reported extensively (Farooq et al., 2020).

Since younger students tended to be located abroad, maybe they did not have the time either to adjust to academic life or to connect to their university before the pandemic. This highlights the importance of university life that expands beyond the curriculum and reaches the social life of students. From this study, it was clear that the student's state of mind affected greatly how they perceived and impacting their own performance and the performance of the professors. Their scholarly attitude strongly correlated with the stress and the isolation feeling and so did their attitude towards their professors' efforts. Factors that most affected that attitude were their living conditions but not the gender, age nor personality intro/extroversion.

Many college recruiters have been researching the burn-out predictors for future college students. Research has shown that burnout levels significantly increase with the rise of both academic stress and psychological distress. Neuroticism has an indirect impact on burnout, as they both increase in a parallel manner. Emotional intelligence, on the other hand, has a significant direct effect on lowering burnout, but its positive effect is reduced when psychological distress and neuroticism are present (Yusoff et al., 2021). It is therefore apparent that multiple factors can simultaneously affect the psychological profile of students and that this profile can be modified by external factors. As it is evident, even without external circumstances the medical academic life is not easy. The desire to succeed coupled with difficulties in achieving success can lead to an imbalance of the "effort-reward equilibrium that leads to burnout (Larki et al., 2018). However, in

our study, this type of characteristic was not investigated extensively. We only assessed the introversion score, and this does not seem to be affecting the remaining parameters. Maybe the living conditions during a pandemic are stressful enough for everybody to mask the impact of personality characteristics.

Medical studies can be challenging, but for some students, they can truly become a source of anxiety. Previous studies suggest that stress can impact negatively on students' mental health and that burnout is frequently reported among medical school students (Collin et al., 2020). The studies suggest greater stress levels than depression, among medical students, with the women showing greater percentages of burnout (Castaldelli-Maia et al., 2019). However, in our study, gender did not affect any of the parameters studied.

The same goes with the age/stage of studies, as no apparent difference was observed in respect to the psychological parameters, though previous reports mention cycles of elation and despair depending on the year of studies, peaking towards graduation (Moutinho et al., 2017). This discrepancy of the demographics is due to the heightened negative feelings everybody has been feeling during the COVID-19 lockdowns, that made smaller group difference less apparent. Indeed, almost all students were clustered in the high burnout scales for both exhaustion and disengagement. These high percentages are not uncommon among medical students in general, even before the pandemic (Almeida et al., 2019).

When studying abroad, more challenges need to be overcome and issues of adaptability and adjustment need to be addressed. International students live away from their home countries and therefore have created coping mechanisms and systems to compensate for this loss and missing out. This mechanism includes developing strong friendly bonds or brings family over to accompany them through their studies. Interestingly, a report on burnout predictors for international students in the Eastern Caribbean medical schools, pre-COVID-19, showed that there was no significant predictive link between being a medical student or having family support and the overall burnout, whereas there was a strong correlation between previous diagnosis and presence of a mental disorder and burnout (Lewis, 2020). Similarly, in our study, the dwelling conditions, and their residence in or out of China did not impact the OLBI scores. Moreover, half of the students were living with their family during the lockdown, and most of them with someone they were familiar with (either relative or friend). Their self-reported social bubble was considerable, creating a substantial social safety net around them. A study of international Chinese students in South Korea that linked the lower levels of psychosocial well-being directly as well as indirectly via acculturation and academic burnout (Jin et al., 2021). Another study reported higher stress levels in international medical students due to COVID-19 in comparison to local medical students (O'Byrne et al., 2021).

Moving forward, acknowledging the difficulties of international students is imperative for universities to support them. A recent study has shown that students have increased stress levels at the end of the semester, which coincides with the semester assessment processes. In that study,

junior medical students (<3y) were compared when having frequent formative assessments during the year vs end-of-the-year summative examinations. The stress levels were higher in the former group than the latter, suggesting that changes in the curriculum structure can have a beneficial effect on students' well-being (Merrick et al., 2021). On the other hand, a large meta-analysis of a large group of students in China of different learning levels showed that learning burnout interventions can be effective and should be implemented more rigorously and consistently (Tang et al., 2021).

4 Conclusion

The pandemic has created more challenges and strain on the psychology of international students, which affects their well-being and academic progress. More specifically the students, who during the pandemic were studying outside China, were affected the most. Going forward it is evident that remote studying is going to continue as a valid, parallel system of university attendance, therefore more effort must be applied worldwide to develop compatible international systems that permit studies across the globe. China being the 3rd country in international students' recruitment needs to lead the way to such improvements and developments. This is going to be vital in the future of international studying, especially in the medical field which is known to be tough and demanding.

5 Availability of Data and Material

Data can be made available by contacting the corresponding author.

6 References

- Almeida, T., Kadhum, M., Farrell, S. M., Ventriglio, A., & Molodynski, A. (2019). A descriptive study of mental health and wellbeing among medical students in Portugal. *International Review of Psychiatry*, 31(7-8), 574-578. DOI: 10.1080/09540261.2019.1675283
- Amato, R., Pearson, R. D., Almagro-Garcia, J., Amaratunga, C., Lim, P., Suon, S., Sreng, S., Drury, E., Stalker, J., Miotto, O., Fairhurst, R. M., & Kwiatkowski, D. P. (2018). Origins of the current outbreak of multidrug-resistant malaria in southeast Asia: A retrospective genetic study. *The Lancet Infectious Diseases*, 18(3), 337-345. DOI: 10.1016/S1473-3099(18)30068-9
- Brouwer, J., & Jansen, E. (2019). Beyond grades: Developing knowledge sharing in learning communities as a graduate attribute. *Higher Education Research & Development*, 38(2), 219-234. DOI: 10.1080/07294360.2018.1522619
- Cardinale, M., Newton, R., & Nosaka, K. (2011). *Strength and Conditioning*. Wiley-Blackwell.
- Castaldelli-Maia, J. M., Lewis, T., Santos, N. M. dos, Picon, F., Kadhum, M., Farrell, S. M., Molodynski, A., & Ventriglio, A. (2019). Stressors, psychological distress, and mental health problems amongst Brazilian medical students. *International Review of Psychiatry*, 31(7-8), 603-607. DOI: 10.1080/09540261.2019.1669335
- Collin, V., O'Selmo, E., & Whitehead, P. (2020). Stress, psychological distress, burnout and perfectionism in UK dental students. *British Dental Journal*, 229(9), 605-614. DOI: 10.1038/s41415-020-2281-4
- Ezenwaji, I. O., Eseadi, C., Ugwoke, S. C., Vita-Agundu, U. C., Edikpa, E., Okeke, F. C., Nwafor, B. N., Ozioko, A. N., Ebinyasi, J. O., Nwabuko, L. O., Njoku, L. G., & Agu, M. A. (2019). A group-focused

rational emotive behavior coaching for management of academic burnout among undergraduate students. *Medicine*, 98(30). DOI: 10.1097/MD.00000000000016352

- Farooq, F., Rathore, F. A., & Mansoor, S. N. (2020). Challenges of Online Medical Education in Pakistan During COVID-19 Pandemic. *Journal of the College of Physicians and Surgeons Pakistan*, 30(1), 67-69. DOI: 10.29271/jcsp.2020.Supp1.S67
- Jin, L., Yang, E., & Zamudio, G. (2021). Self-determined motivation, acculturation, academic burnout, and psychosocial well-being of Chinese international students in South Korea. *Counselling Psychology Quarterly*. DOI: 10.1080/09515070.2021.1887084
- Larki, M., Ghaffari, M., & Baezzat, F. (2018). The effort-reward imbalance theory and measurement of stress in academic context: Construction and validation of student version of the Effort-Reward Imbalance Questionnaire (ERIQ-S). *Occupational Medicine Quarterly Journal*, 10(2), 72-83.
- Lewis, D. (2020). *Exploring Predictive Variables of Burnout in Students Attending Eastern Caribbean Medical Schools*. Walden Dissertations and Doctoral Studies. <https://scholarworks.waldenu.edu/dissertations/9592>
- Li, J., Han, X., Wang, W., Sun, G., & Cheng, Z. (2018). How social support influences university students' academic achievement and emotional exhaustion: The mediating role of self-esteem. *Learning and Individual Differences*, 61, 120-126. DOI: 10.1016/j.lindif.2017.11.016
- Li, W., & Sun, H. (2019). Migration intentions of Asian and African medical students educated in China: A cross-sectional study. *Human Resources for Health*, 17(1), 88. DOI: 10.1186/s12960-019-0431-z
- Merrick, D., Mbaki, Y., Pratten, M. K., & Simpson, T. G. (2021). Exploring wellbeing in first year medical students amidst a curriculum change. *BMC Medical Education*, 21(1), 252. DOI: 10.1186/s12909-021-02678-9
- Moutinho, I. L. D., Maddalena, N. de C. P., Roland, R. K., Lucchetti, A. L. G., Tibiriçá, S. H. C., Ezequiel, O. da S., & Lucchetti, G. (2017). Depression, stress and anxiety in medical students: A cross-sectional comparison between students from different semesters. *Revista Da Associação Médica Brasileira*, 63, 21-28. DOI: 10.1590/1806-9282.63.01.21
- O'Byrne, L., Gavin, B., Adamis, D., Lim, Y. X., & McNicholas, F. (2021). Levels of stress in medical students due to COVID-19. *Journal of Medical Ethics*, 47(6), 383-388. DOI: 10.1136/medethics-2020-107155
- Rudinskaitė, I., Mačiūtė, E., Gudžiūnaitė, G., & Gerulaitytė, G. (2020). Burnout Syndrome Amongst Medicine Students in Lithuania and Germany. *Acta Medica Lituanica*, 27(2), 53-60. DOI: 10.15388/Amed.2020.27.2.2
- Shaw, R., Kim, Y., & Hua, J. (2020). Governance, technology and citizen behavior in pandemic: Lessons from COVID-19 in East Asia. *Progress in Disaster Science*, 6, 100090. DOI: 10.1016/j.pdisas.2020.100090
- Talih, F., Daher, M., Daou, D., & Ajaltouni, J. (2018). Examining Burnout, Depression, and Attitudes Regarding Drug Use Among Lebanese Medical Students During the 4 Years of Medical School. *Academic Psychiatry*, 42, 288-296.
- Tang, L., Zhang, F., Yin, R., & Fan, Z. (2021). Effect of Interventions on Learning Burnout: A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, 12, 645662. DOI: 10.3389/fpsyg.2021.645662
- Wilder-Smith, A., Lee, V., & Gubler, D. J. (2019). Yellow fever: Is Asia prepared for an epidemic? *The Lancet Infectious Diseases*, 19(3), 241-242. DOI: 10.1016/S1473-3099(19)30050-7

Yadav, P. D., Malhotra, B., Sapkal, G., Nyayanit, D. A., Deshpande, G., Gupta, N., Padinjaremathil, U. T., Sharma, H., Sahay, R. R., Sharma, P., & Mourya, D. T. (2019). Zika virus outbreak in Rajasthan, India in 2018 was caused by a virus endemic to Asia. *Infection, Genetics and Evolution*, 69, 199-202. DOI: 10.1016/j.meegid.2019.01.026

Yusoff, M. S. B., Hadie, S. N. H., & Yasin, M. A. M. (2021). The roles of emotional intelligence, neuroticism, and academic stress on the relationship between psychological distress and burnout in medical students. *BMC Medical Education*, 21(1), 293. DOI: 10.1186/s12909-021-02733-5



Mohammed ALGerafi is a Ph.D. candidate at the College of Education, Shaanxi Normal University (SNNU), Xi'an China. His research interests include Educational Technology, Artificial Intelligence in Education, Electronic Education, Virtual Medical Teaching, and currently on the Impact of COVID-19 on Education.



Wenlan Zhang is Professor, Associate Dean in the School of Education and Director of the Institute for Digital Education at the Shaanxi Normal University (SNNU). Her major area is on Learning Psychology and Technology, ICT Uses in K-12 Teaching and Learning and Blend Learning.



Tram Huynh To is a Dentist, a Lecturer, and a Researcher in Vietnam. She got her Master's Degree from the Faculty of Odonto-stomatology, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. She works at Hong Bang International University. Her research interests include Dental Sciences, Pediatric Dentistry, and Public Health.
