

IMPACT OF DIGITAL PEDAGOGY ON THE PSYCHOLOGICAL WELLBEING OF STUDENTS DURING GLOBAL PANDEMICS: A NARRATIVE REVIEW

*Kritika Chaudhary

Delhi University

*Corresponding email: kritika.dhiani@gmail.com

Received date: 20 November 2021; Accepted date: 5 February 2022

Abstract: The migration of the teaching learning process to online mode during the pandemic has posed a plethora of difficulties and challenges for the young students across the world. It highlights the difficulties faced by students and the stress on the education system during times of medical health emergencies and lockdown situations in the past. Objective: To undertake a narrative review of studies assessing the impact of the lockdown crisis on the student wellbeing and education. Methods: Keyword searches of PubMed and Google Scholar databases led to the identification of 25 studies for the present review. Results: Studies (n = 25) exploring the students' experience of lockdown and the impact of pandemic situations on their education were identified. Analysis of the results of these studies revealed the following main themes: Impact on students' mental health, causes of deteriorated mental health of students: multiple heterogeneous stressors, socio-economic divide in education, gendered impact of epidemics and impact on the educational system: challenges of e- learning. Conclusion: Lockdown situations not only disrupt the normal study routine of students and causes a slowdown in their learning curve; it also creates a significant mental burden causing adverse impacts on their mental health. The lack of appropriate technological devices and the lack of sufficient internet bandwidth has deepened the educational divide. Remote education systems have proven inadequate in replicating the chalk and talk methodologies of teachers. Future directions are discussed.

Keywords: Online, Education, Wellbeing, Lockdown, Pandemic

INTRODUCTION

COVID 19 pandemic has gravely impacted the education system across the world. The imposition of the worldwide lockdown in order to prevent the spread of the deadly virus has led to the unprecedented shutting down of educational institutions. The UNESCO report suggests that nearly 90% of the student

population has been hit by coronavirus during the month of April, 2020. It brings to attention the difficulties faced by students and the adverse impacts on education system during epidemics and pandemics in the past. These emergency situations have often led to imposition of lockdowns and subsequent adoption of online methods of teaching by the educators in various institutions. Online learning can be considered as “learning experiences in synchronous or asynchronous environments using different devices with internet access” (Singh & Thurman, 2019). Online pedagogical mode presents a repertoire of challenges ranging from downloading issues, bandwidth problems, login problems and so on. Students have reported difficulties in sustaining attention during virtual classes and often find such classes uninspiring and mundane (Dhawan, 2020). Often, students seek two-way interaction and discussions with their instructors and that is hard to achieve on online platforms. The outcome of online education may also be limited as students are unable to practice and apply the skills and learning from the online classes in the real world. Further, the quality of the course content may also be a pertinent concern. Several students have reported that the main barriers for online learning are technical glitches, isolation and problems in understanding instructional objectives (Song et al., 2004). Additionally, in India, students have limited access to digital resources. This digital revolution highlights the economic disparity between rich and poor in India. Many students are unable to afford computer, laptop or smart phones, thereby widening the digital divide among students. The students from economically disadvantaged families aren't able to explore online learning well because of the inaccessibility to e-resources.

The pandemic crisis has adversely impacted the wellbeing of college students as well. Further, such mental health issues considerably affected the academic performance of students and their social interactions which impacted their future career trajectories and personal opportunities, in turn (American College Health Association, 2020). High probability for misinformation to be propagated through online sources that are being used by the youth contributed to stress, depression and anxiety among college going students (Basch et al., 2020). The present review delves into the impact of the epidemic/pandemic crisis like lockdown and quarantine on the psychological wellbeing of students and its impact on the education system.

METHODS

A literature search was conducted with the two electronic databases: PubMed, and Google Scholar. Search terms included "pandemic," "epidemic," "COVID 19," "students," "education," "experiences," "mental health", "online learning" and "disaster". Different combinations of these terms were formed. The research articles were properly read and assessed for relevance.

The inclusion criteria were

- (i) academic journal articles published in English between the years 2010 and 2020;
- (ii) research that focused on the students' experiences during medical health emergency situations, such as pandemics and epidemics
- (iii) research that focused on the impact on the education system during epidemics/pandemics

After screening, 25 studies were found to be relevant and were included in this review. More research work was available during the COVID 19 pandemic as opposed to any prior epidemic situation. The characteristics of the reviewed articles are summarized in the table.

RESULTS AND DISCUSSION

Authors and year	Country	Sample size	Method	Findings
Raj & Fatima (2020)	India	500 students	Questionnaires	69.8% of students were stressed about studies and 78.5% of students were uncomfortable with online classes.
Gonzalez et al. (2020)	Spain	2530 members of the University of Valladolid	Cross-sectional study using online survey.	Moderate to extremely severe levels of anxiety were experienced by 21.34%, 34.19% and 28.14 of the participants respectively.
Wheaton (2011)	United States	315 college students	Online questionnaire packet described as a "Survey of Thoughts and Feelings"	The significant predictors of swine flu related anxiety were disgust sensitivity, health anxiety and contamination fears.
Van et al. (2010)	Australia	2882 UNSW staff and students	Online survey	99.6% participants were cognizant of the Australian pandemic situation and 64.2% reported either "no anxiety" or disinterested.
Cao et al. (2020)	China	7143 college students from Changzhi medical college	Questionnaire packet including 7-item Generalized Anxiety Disorder Scale (GAD-7)	Percentages of participants reporting severe, moderate and mild anxiety were 0.9%, 2.7% and 21.3% respectively. Family income stability, living in cities or living with parents were identified as protective factors against anxiety.
Jadhav, Bagul & Aswale (2020).	India	100 graduate and postgraduate students	Online survey	90% students reported that lockdown had immense impact on education. Heightened fear of COVID 19 caused difficulty in concentration on studies.

Kapasia et al. (2020)	India	232 undergraduate and postgraduate students	Online survey	70% of learners were engaged in online learning during lockdown. The common concerns reported by students were pertaining to mental health, poor internet connection and non-conducive home environments to study.
Tyagi & Malik (2020)	India	1700 students and 500 teachers of ten schools	Online survey	Students and teachers have reported that they have faced health concerns due to increased screen time and absence of face-to-face interaction
Mahdy (2020)	92 countries	1392 veterinary medical students and researchers	Questionnaire	Academic performance of 96.7% of the participants was affected to varying degrees in the COVID19 lockdown.
Lall & Singh (2020)	India	200 students	Observational, Descriptive study. Questionnaire was used.	74% students liked the system of online learning. 49% of the participants preferred online learning and 34% participants identified the lack of co-curricular activity as a major challenge
Marelli et al. (2020)	Italy	400 participants including 307 students and 93 university administration staff	Online survey	Insomnia significantly increased to 40%. Depression (27.8%) and anxiety (34.3%) increased.
Son et al. (2020)	United States	195 university students	Interview surveys.	Majority of the sample (91%) reported problems in concentration (89%), sleep disturbances (86%), decreased social interactions due to social distancing (86%) and

				increased difficulties in academics (82%).
Sundarasen et al. (2020)	Malaysia	983 university students	Online survey	Higher levels of anxiety were significantly linked with female gender($p=0.020$), age below 18 years($p=0.014$), age 19-25($p=0.06$) and pre university level of education($p=0.001$).
Bonal & González (2020)	Spain	35,419 students	Online survey	Learning opportunities varied significantly according to different social backgrounds.
Durai & Debbarma (2020)	India	175 students	Structured questionnaire	Stress and insecurity regarding future was reported.
Kaparounaki et al. (2020)	Greece	1000 university students	Online survey	Increases in symptoms of anxiety (42.5%), depression (74.3%) and total suicidal thoughts (63.3%) and increase in quantity of sleep (63.3%) was reported. Quality of life worsened (57%).
Elsalem et al. (2020)	Jordan	1019 undergraduate students of Medical Sciences	Online survey	E-exams increased stress (32%), had deleterious impacts on the students' dietary habits, sleep quality, physical activity and smoking habits.
Gallego-Gómez et al. (2020)	Spain	138 nursing students	Observational prospective study and	Stress due to financial, family and emotional problems increased considerably.
Aucejo et al. (2020)	US	1500 students	Online survey	People belonging to economically disadvantaged backgrounds were 55% more likely to have delayed graduation than their peers from higher socioeconomic strata.

Elmer, Mepham & Stadtfeld (2020).	Switzerland	212 undergraduate students	Questionnaires	Fears pertaining to COVID-19, lack of interaction and physical isolation and emotional support were associated with poor mental health trajectories.
Agius et al. (2020)	Malta	97 dental students	Questionnaire	Women students experienced significantly more anxiety than their male counterparts.
Tasnim et al. (2020)	Bangladesh	3331 university students	Cross-sectional online survey	Prevalence rate of suicidal ideation during lockdown was 12.8%.
Bao (2020)	Bangladesh	400 college students	Online focus group and discussion questionnaire	“E-Learning crackup.” is significantly related to student psychological distress and the worry of losing an academic year also contributed to mental stress during COVID-19 lockdown.
Ngegba & Mansaray (2016)	Africa	400	Questionnaire	Teenage pregnancy (22.0%) and girl child school dropouts increased during Ebola.
Duraku & Nagavci (2020)	Kosovo	12 participants (5 experts, 7 caregivers and teachers)	Semi structured online interviews and case study method	Home isolation, lack of socialization, changes in regular routines and lack of assisting services had adverse emotional impacts on students with disability.

Analysis of the results of studies included in this paper revealed the following main themes:

- **Impact on students' mental health**

Previous literature suggested deteriorating impacts on the mental health of students during the outbreak of infectious diseases. The study on an Indian sample of 500 students aimed at understanding the mental health condition of students and the problems faced by them during the lockdown revealed heightened levels of mental stress due to the threat caused by lockdown (Raj & Fatima, 2020). Studies across the world reflected a similar trend. A cross sectional study conducted in the university community with a sample of 2530 members in Spain reported that a total of 50.43% participants experienced moderate to severe anxiety (21.34%), depression (34.19%) and stress (28.14%). An interesting comparison showed that students from Social Sciences, Arts & Humanities and Law scored higher on anxiety, depression and stress as compared to students of Engineering & Architecture (Gonzalez et al., 2020). Stress increased in homebound nursing students of Spain (n=138) due to the pandemic (Gallego-Gómez et al., 2020). Stress, loneliness, anxiety and depressive symptoms worsened in Swiss undergraduate students (N=212) during the pandemic (Elmer et al., 2020). Questionnaire with open ended and close ended questions (n = 97) from students at the University of Malta revealed significant increases in anxiety due to COVID-19 (Agius et al., 2020). Furthermore, lack of concentration, anxiety, stress and fear of COVID were reported as reasons for declining motivation to study during the lockdown period (Jadhav, Bagul and Aswale, 2020).

Marelli et al. (2020) examined the impact of COVID-19 lockdown on the sleep quality of university students. Exacerbation of sleep quality and symptoms of insomnia were reported. Additionally, delay in bedtime and wake up time was experienced. 27.8% participants showed symptoms of depression and 34.3% were dealing with anxiety. Kaparounaki et al. (2020) carried out an online survey on 1000 university students and reported that 42.5% students suffered from anxiety, 74.3% from depression and a striking 63.3% had suicidal thoughts. Sleep disturbances were reported as the quantity of sleep increased but its quality worsened by 43%. There was an 8-fold increase in suicidal ideation during the pandemic. The prevalence estimate of suicidal ideation was reported to be 12.8% in a sample of Bangladeshi university students (n=3331) during the onset of COVID-19 (Tasnim et al., 2020). The underlying risk factors included sleep disturbances, smoking, family history of mental health issues like depression or anxiety.

Another interesting finding was related to the impact of emotional struggle of students and the inability to regulate their emotions on their ability of reading

comprehension (Vallejo & Maron, 2020). The results of 40 semi structured interviews (20 parents and 20 teachers) informed that students as well as their parents faced difficulties in regulating their emotions amidst the pandemic situation which adversely impacted the students' ability to comprehend text material. Additionally, problems of emotional regulation and comprehension of texts increased in the COVID times, thus causing the teachers and parents to express concerns on the impact of lockdown on the learning process and exacerbation of learning difficulties.

Further, one such study was conducted during the H1N1 influenza pandemic in 2009-2010, and investigated the swine flu related anxiety. Wheaton et al (2011) reported that anxiety was a common response to swine flu in a sample of 315 college students.

Conversely, the psychological implication of lockdown situations has been relatively less severe in certain areas. A study on Chinese college students using 7 item Generalized anxiety disorder scale revealed that only 0.9% respondents experienced severe anxiety, 2.7% moderate anxiety whereas 21.3% experienced mild anxiety (Cao et al. 2020). Similarly, Van et al. (2010) examined the perceptions and responses of a sample of 2882 respondents from a university in Australia, towards H1N1 pandemic. Surprisingly, 64.12% reported "no anxiety" or "disinterest". A total of 75.9% respondents revealed that they had not made any lifestyle changes due to pandemic and 20.8% had included a simple health behaviour of maintaining hand hygiene in their routines. Additionally, Asian born participants had a significantly higher belief that pandemic was serious when compared to participants from other regions.

- Causes of deteriorated mental health of students: Multiple heterogeneous stressors

The most prominent reason for increased distress in students during the pandemics/epidemics was the fear of contracting the infection and the concerns regarding the safety of their loved ones. Son et al. (2020) through semi structured interview surveys of 195 students identified multiple stressors during the pandemic. Some of the main stressors were concerns regarding their personal health and the health of their loved ones. Likewise, regression analysis revealed that the significant predictors of swine flu anxiety in college students were contamination fear, health anxiety and disgust sensitivity (Wheaton et al., 2011). The constant worry of contracting the corona infection significantly increased anxiety (Agius et al., 2020).

Additionally, infection in the close social circle led to heightened levels of anxiety. Cao et al. (2020) found that infected relatives served as a risk factor in raising anxiety levels.

The adoption of online platforms for education during the lockdown and physical distancing added to the difficulty of students, some of whom perceived this change as problematic and stressful. The statistical analysis by Raj & Fatima (2020) revealed that overall, 51.4% students felt stressed due to the threat of COVID 19 and 69.8% students reported stress about their studies. This stress may be linked to the difficulties faced due to the pandemic induced migration to online learning as 78.5% students were uncomfortable with online classes. Likewise, delays in academic activities were positively correlated with anxiety (Cao et al. 2020). Decreased concentration and increased worries about academic performance were detailed as causes of stress (Son et al., 2020).

Furthermore, Elsam et al. (2020) assessed the experiences of online exams during the COVID 19 pandemic in students pursuing Medical Sciences. In the survey administered on 1019 participants, it was reported that 32% respondents experienced more stress during remote online exams. The major causal factors of stress were exam duration, technical connectivity issues and mode of navigating questions. It also negatively impacted students' sleep, dietary habits, led to less exercising and greater smoking habits. An increase in stress led to decreased academic performance. Poor performance in online exams was seen as an additional stressor in these students (Gallego-Gómez et al., 2020). Exam related anxiety due to the uncertain pandemic situation was reported by students in the research by Agius et al. (2020).

The removal of social support from one's life due to the limited exposure to physical meetings during periods of isolation and self-quarantining, adopted as preventive measures to contain the spread of epidemic infections further increases feelings of discomfort, and loneliness. A decline in social interactions and missing social life were identified as stressors in multiple studies (Son et al., 2020; Elmer et al., 2020). Correlational analysis revealed that social support was negatively correlated to anxiety and emerged as a protective factor against anxiety (Cao et al., 2020).

Uncertainty and worries regarding their future were also reported as major stressors by students (Sundarassen et al.,2020; Elmer et al., 2020). Durai et al. (2020) concluded that heightened uncertainty among the students regarding their future plans led to mental stress and feelings of insecurity. Furthermore, the fear of losing an academic year had significant positive correlation with mental distress (Bao et al., 2020).

Some other stressors included family emotional problems and financial difficulties during the times of uncertainty (Sundarassen et al.,2020; Gallego-Gómez et al., 2020; Cao et al., 2020).

- The socio-economic divide in education

The COVID 19 lockdown specifically brought to the forefront the widening educational divide due to a limited digital access among the marginalized sections of the society. The marginalized sections faced greater difficulties in accessing education due to the scarcity of limited technological resources at their disposal. The survey of 1500 students in the US revealed a socioeconomic divide wherein 55% students belonging to the lower income strata were more likely to have delayed graduation as compared to their high-income peers. Additionally, 40% students lost their job offers or internships and 29% students expected to earn less in future, at age 35 (Aucejo et al., 2020). Bonal et al. (2020) investigated the impact of lockdown on the learning gap between children from diverse social backgrounds. An online survey with a sample of 35,419 participants revealed the lack of learning opportunities for students belonging to socially disadvantaged groups. School based learning and after - school activities decreased due to the visible differences in technological devices among students from low socio-economic backgrounds. The already existing inequalities in educational attainment attributed to differences in parental education and knowledge among upper and lower background became even more acute during the lockdown as school support declined.

- Gendered impact of epidemics

Female students had been more vulnerable in such situations than their male counterparts. A study assessing the impact of Ebola epidemic on the education system in Sierra Leone revealed that Ebola outbreak had a great impact on the education of girls (Ngegba & Mansaray, 2016). Teenage pregnancies rised drastically by about 22% as did the rates of girl child dropouts. The major reasons behind the high dropout rates among girls were the shift in their roles as primary caretaker of the family (30%) and assuming the responsibility of becoming breadwinners in their homes as they lost their parents to the illness. Owing to additional family responsibility, these girls lost their concentration in studies and did not sit in external examinations. Moreover, a strikingly high proportion of girls died in the epidemic (39%).

Female students reported worse mental health status such as high anxiety levels, loneliness, stress, depression, in comparison to males (Sundarassen et al.,2020; Marelli et al., 2020). Due to increased integration of females into the social system, it has been concluded that a sudden lack of social support led to their deteriorated mental health (Elmer et al., 2020). Additionally, the uncertainty tolerance threshold of females was described to be lower than males and thus, crossing the threshold in situations of crisis/epidemics triggered excessive anxiety (Sundarassen et al., 2020).

- Impact on the educational system: Challenges of e- learning

Technical problems of internet connectivity as well as scarcity of digital devices along with a lack of conducive home environments posed problems. Kapasia et al. (2020) studied the impact of COVID 19 imposed lockdown on undergraduate and postgraduate students in the state of West Bengal, India. Consisting of a sample of 232 students, survey results showed that 70 % students were involved in e-learning, most of whom used mobile phones to attend online classes. However, students reported difficulties in learning due to poor internet connectivity and disturbing home environments making the home setting unfavorable for study. Another study by Tyagi & Malik (2020) including questionnaire responses from 500 teachers and 1700 students from a total of 10 schools in Delhi NCR, India found that poor internet connectivity posed a major problem. Increased health concerns had been reported by teachers and their students due to greater exposure to screen time. The lack of face-to-face classroom interaction affected teaching learning experience. Poor network connection, technical faults, in the northeastern parts of India led to difficulties in teacher-student communications as reported in a questionnaire study (Durai et al., 2020). Practical lessons and co-curricular activities remain neglected in the online medium. Mahdy (2020) carried out a study on 1392 respondents from 92 different countries using online questionnaires to understand the impact of lockdown on the academic performance of veterinary students. The academic performance of 96.7% participants was impacted. Students remarked that it was problematic to practice and learn veterinary competencies through the existing online system of education. Study by Choi et al., (2020) tried to identify the impact of lockdown on final year medical students by administering surveys on a sample of 441 students from 32 medical schools in the UK. It was found that the students felt less confident in entering the foundational training. Lall and Singh (2020) investigated the students' attitude and perspective towards online classes following the prevalence of online teaching-learning process during COVID 19 pandemic. Data was collected from 200 students using questionnaires. The results revealed that 74% students were satisfied with the online classes out of which 49% attributed their satisfaction with the online classes to the flexibility in study time as they could now study anytime, they wanted to. Consequently, lack of co-curricular activities was reported as the most common issue with online classes (34%). While students were satisfied with the procedure as well as content of online mode of classes, a general lack of co-curricular activities was felt. The perception of "e-learning" crackup posed another challenge. The higher expectation of students and the declined motivation of teachers in online classes led to e-learning crack up. Additionally, the inaccessibility to technological equipment like laptops and a stable internet connection reportedly acted as major obstacles to productive e-learning systems (Bao, 2020).

Furthermore, Duraku and Nagavci(2020) explored the impact of the pandemic on

inclusive education and wellbeing of children with disabilities during COVID-19. It was suggested that isolation at home, paucity of socialization, alterations in daily schedules and lack of services led to deterioration of emotional health of students with disabilities precipitating parental overload and stress.

CONCLUSION

Lockdown situations not only disrupt the normal study routine of students and causes a slump in their learning curve, it also creates a significant mental burden leading to adverse impacts on their mental health. Epidemics and pandemics lead to heightened anxiety and mental distress in the students. Moreover, the pandemic-imposed migration towards e-learning platforms is fraught with various technical challenges. The lack of appropriate technological devices and the lack of sufficient Internet bandwidth has deepened the educational divide as the needs of the marginalized groups are completely uncatered. The gendered impact of lockdown is evident as it depletes educational opportunities for females leading to not only a widening educational divide on the basis of gender but also exposes the girl students to increased mental health issues. To summarize, remote education systems have proven largely inadequate in replicating the chalk and talk methodologies of teachers.

Future Directions

The COVID 19 pandemic has brought forth the need to build a resilient system of education to ensure productivity of young children. Effective interventions should be planned to provide mental health assistance to students during such times of global crisis. Psycho-education shall be made a necessary part of the academic curriculum. Access to internet connectivity and provisioning of critical hardware equipment in the remotest of areas and the marginalized communities shall be facilitated to prevent a large-scale educational divide owing its existence to the digital divide. Teachers should be professionally trained and motivated to upgrade their pedagogy to meet the demands arising from the shift to online education. Innovations in pedagogy shall be emphasized to make learning more meaningful through active student engagement. A multimodal and a multi-channel education integrated with portfolio assessments is the key.

REFERENCE

- Agius, A. M., Gatt, G., Vento Zahra, E., Busuttil, A., Gainza-Cirauqui, M. L., Cortes, A., & Attard, N. J. (2020). Self-reported dental student stressors and experiences during the COVID-19 pandemic. *Journal of Dental Education*, 10, 1002. <https://doi.org/10.1002/jdd.12409>
- Aucejo, E. M., French, J., Ugalde Araya, M. P., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. *Journal of Public Economics*, 191, 104271. <https://doi.org/10.1016/j.jpubeco.2020.104271>

- Bao, N.H.Y. (2020). Impact of “e-Learning crack-up” perception on psychological distress among college students during COVID-19 pandemic: A mediating role of “fear of academic year loss”. *Children and Youth Services Review*, 118. <https://doi.org/10.1016/j.chilyouth.2020.105355>
- Basch, C.H., Hillyer, G.C., Meleo-Erwin, Z.C., Jaime, C., Mohlman, J., Basch, C.E. (2020). Preventive behaviors conveyed on youtube to mitigate transmission of COVID-19: Cross-sectional study. *JMIR Public Health Surveillance*, 6(2), e18807. <https://doi.org/10.2196/18807>
- Bonal, X., González, S. The impact of lockdown on the learning gap: Family and school divisions in times of crisis. *International Review of Education*, 1. <https://doi.org/10.1007/s11159-020-09860-z>
- 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 Research*, 287, 112934. <https://doi.org/10.1016/j.psychres.2020.112934>
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Durai, T., Debbarma, I. (2020). Educational disruption: Impact of COVID-19 on students from the northeast states of India. *Children and Youth Services Review*, 120,105769. <https://doi.org/10.1016/j.chilyouth.2020.105769>.
- Elmer, T., Mepham, K., & Stadtfeld, C. (2020). Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. *PLoS one*, 15(7), e0236337. <https://doi.org/10.1371/journal.pone.0236337>
- Elsalem, L., Al-Azzam, N., Jum'ah, A.A., Obeidat, N., Sindiani, A.M., Kheirallah, K.A. (2020). Stress and behavioral changes with remote e-exams during the Covid-19 pandemic: A cross-sectional study among undergraduates of medical sciences. *Annals of Medical Surgery*, 60, 271-279. doi: 10.1016/j.amsu.2020.10.058.
- Gallego-Gómez, J. I., Campillo-Cano, M., Carrión-Martínez, A., Balanza, S., Rodríguez-González-Moro, M. T., Simonelli-Muñoz, A. J., & Rivera-Caravaca, J. M. (2020). The COVID-19 pandemic and its impact on homebound nursing students. *International Journal of Environmental Research and Public Health*, 17(20), 7383. <https://doi.org/10.3390/ijerph17207383>
- Hyseni Duraku, Zamira & Nagavci, Mirjeta. (2020). The impact of the COVID-19 pandemic on the education of children with disabilities. 10.13140/RG.2.2.17807.41125.
- Jadhav, V.R., Bagul, T.D., Aswale, S.R. (2020). COVID-19 era: Students' role to look at problems in education system during lockdown issues in

- Maharashtra, India. *International Journal of Research and Review*, 7(5), 328-331.
- Kaparounaki, C. K., Patsali, M. E., Mousa, D. V., Papadopoulou, E., Papadopoulou, K., & Fountoulakis, K. N. (2020). University students' mental health amidst the COVID-19 quarantine in Greece. *Psychiatry research*, 290, 113111. <https://doi.org/10.1016/j.psychres.2020.113111>
- Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., Barman, B., Das, P., & Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. *Children and Youth Services Review*, 116, 105194. <https://doi.org/10.1016/j.childyouth.2020.105194>
- Lall, S. & Singh, N. (2020). CoVid-19: Unmasking the new face of education. *International Journal of Research in Pharmaceutical Sciences*, 11, 48-53. <https://doi.org/10.26452/ijrps.v11iSPL1.2122>.
- Mahdy, M.A.A. (2020). The impact of COVID- 19 pandemic on the academic performance of veterinary medical students. *Frontiers in Veterinary Science*, 7, 594261. <https://doi.org/10.3389/fvets.2020.594261>
- Marelli, S., Castelnovo, A., Somma, A. (2020). Impact of COVID-19 lockdown on sleep quality in university students and administration staff. *Journal of Neurology*. <https://doi.org/10.1007/s00415-020-10056-6>
- Ngegba, M. (2016). Perception of students on the impact of ebola virus disease on the education system of Sierra Leone, 6, 119-128.
- Odriozola-González, P., Planchuelo-Gómez, Á., Irurtia, M.J., García R. (2020). Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. *Psychiatry Research*, 290. <https://doi.org/10.1016/j.psychres.2020.113108>.
- Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research*, 22(9), e21279. <https://doi.org/10.2196/21279>
- Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: student perceptions of useful and challenging characteristics'. *Internet and Higher Education*, 7(1), 59–70. <https://doi.org/10.1016/j.iheduc.2003.11.003>
- Sundarasan, S., Chinna, K., Kamaludin, K., Nurunnabi, M., Baloch, G. M., Khoshaim, H. B., Hossain, S., & Sukayt, A. (2020). Psychological impact of COVID-19 and lockdown among university students in Malaysia: Implications and policy recommendations. *International Journal of Environmental Research and Public Health*, 17(17), 6206. <https://doi.org/10.3390/ijerph17176206>
- Tasnim, R., Islam, M. S., Sujan, M., Sikder, M. T., & Potenza, M. N. (2020). Suicidal ideation among Bangladeshi university students early during the COVID-19 pandemic: Prevalence estimates and correlates. *Children and*

-
- Youth Services Review*, 119, 105703.
<https://doi.org/10.1016/j.chilyouth.2020.105703>
- Tyagi, H., Malik, S. (2020). Online teaching in Delhi-NCR schools in India during Covid-19 pandemic. *Indian Journal of Science and Technology*, 13(38), 4036-4054. <https://doi.org/10.17485/IJST/v13i38.1613>
- Van, D., McLaws, M.L., Crimmins, J. (2010). University life and pandemic influenza: Attitudes and intended behaviour of staff and students towards pandemic (H1N1) 2009. *BMC Public Health*, 10, 130. <https://doi.org/10.1186/1471-2458-10-130>
- Wheaton, M., Abramowitz, J., Berman, N., Fabricant, L., Bunmi, B. & Olatunji, O. (2011). Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. *Cognitive Therapy and Research*, 36, 210-218. <https://doi.org/10.1007/s10608-011-9353-3>.