**Table 35A.1 Summary of extracted data from 52 studies included in the scoping review**

| Author(s) | Crisis type | Crisis  details | Duration of crisis and/or associated disruption | Effect of crisis on teaching and learning activities | Country of study | Sample characteristics | Data collection methods | Study  design | Findings (themes) relating to negative effects on student experience / outcomes |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sun et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Hong Kong | 255 undergraduate students from The Education University in Hong Kong, China. | Survey | Cross-sectional | Lack of skills in technology use by teacher Reduced social support |
| Shetty et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | India | 170 third year undergraduate students in Bachelor Medicine/Bachelor Surgery at one institution. | Survey | Cross-sectional | Lack of skills in technology use by teacher Physical risks Psychological risks (e.g., anxiety) Reduced interactivity with peers Reduced social support Reduced engagement |
| Cao et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | China | 7143 undergraduate students of Changzhi Medical College. | Survey | Cross-sectional | Concerns about academic delays |
| Kapasia et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | India | 232 undergraduate and postgraduate Arts, Commerce and Science students studying in various colleges and universities of West Bengal. | Survey | Cross-sectional | Impoverished teaching, learning and assessment Trouble accessing class or learning materials Inadequate study spaces Impacted study habits Limited access to technology or internet |
| Rahiem (2021) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Indonesia | 80 undergraduate students who were halfway through their social science education degree at a public university in Jakarta. | Diaries, essays, focus groups | Cross-sectional | Physical risks Psychological risks (e.g., anxiety) Reduced motivation Reduced engagement |
| Gomez-Ibanez et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Spain | 20 final-year undergraduate nursing students from six Barcelona universities who had been urgently employed by hospitals to provide care due to COVID-19. | Semi-structured interviews | Cross-sectional | Concerns about academic delays Paused or cancelled studies  Social pressure to assist with crisis |
| Elsalem et al. 2020 | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Jordan | 1019 students at Faculties of Medical Sciences (Medicine, Dentistry, Pharmacy, Nursing and Applied Medical Sciences) at Jordan University of Science and Technology. | Survey | Cross-sectional | Impoverished teaching, learning and assessment Physical risks Psychological risks eExam stress / distrust |
| Tsai et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 1881 students of Penn State University who were enrolled in at least one course at the time of the survey | Survey | Cross-sectional | Impoverished teaching, learning and assessment  Reduced academic performance  Inability to attend practical classes / obtain hands-on experience Trouble accessing class or learning materials  Inadequate study spaces Concerns about employability Physical risks Psychological risks (e.g., anxiety) Reduced interactivity with peers Reduced social support  Reduced engagement Limited access to technology or internet |
| Romaniuk & Łukasiewicz-Wieleba (2020). | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Poland | 515 students of education, psychology and sociology at The Maria Grzegorzewska University | Survey | Cross-sectional | Impoverished teaching, learning, assessment Increased workload  Uncertainty around assessments and exams Inability to attend practical classes / obtain hands-on experience Reduced interactivity with teachers Trouble accessing class or learning materials Disorganized teachers Inability to do group work  Lack of focus / concentration / cognitive ability Increased distractions Inadequate study spaces Physical risks  Psychological risks (e.g., anxiety) Stress confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Reduced motivation Reduced interactivity with peers Reduced social support Reduced engagement eExam stress / distrust  Limited access to technology or internet Lack of skills in technology use by students Technology issues |
| Gil Villa et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Spain | Study 1: 1,612 university students from 59 on-site Spanish universities. Study 2: 872 undergraduate university students from 43 on-site Spanish universities and from 47 different degrees. | Survey | Cross-sectional | Concerns about academic delays Impoverished teaching, learning, assessment Reduced academic performance  Increased workload Uncertainty around assessments and exams Inability to attend practical classes / obtain hands-on experience Inconsistency in teaching approaches Disorganized teachers Concerns about future employability Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Limited access to technology or internet |
| Anwar et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Pakistan | 110 undergraduate students at three medical colleges | Survey | Cross-sectional | Impoverished teaching, learning, assessment Inability to attend practical classes / obtain hands-on experience Inconsistency in teaching approaches Reduced interactivity with teachers Lack of focus / concentration / cognitive ability Reduced memory Inadequate study spaces Technology issues |
| Khattar et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | India | 583 undergraduate and postgraduate students enrolled in colleges and universities | Survey | Cross-sectional | Concerns about academic delays Uncertainty around assessments and exams Inability to attend practical classes / obtain hands-on experience Impoverished transition Concerns about future employability Physical risks Psychological risks (e.g., anxiety) Reduced social support Impacted study habits Reduced possibilities for student life (e.g., extracurricular activities) Limited access to technology or internet |
| Jones et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 587 undergraduate and graduate health professions students | Survey | Cross-sectional | Impoverished teaching, learning, assessment  Increased workload  Reduced interactivity with teachers Reduced interactivity with peers Technology issues |
| Peloso et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Brazil | 704 graduate students in health-related disciplines at a private university. | Survey | Cross-sectional | Reduced academic performance Inability to attend practical classes / obtain hands-on experience  Lack of focus / concentration / cognitive ability Impacted study habits |
| Kyne & Thompson (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Australia | 141 first-year undergraduate chemistry students at an Australian university | Survey | Cross-sectional | Trouble accessing class or learning materials Impoverished transition Lack of focus / concentration / cognitive ability Increased distractions Inadequate study spaces Reduced interactivity with peers Reduced possibilities for student life (e.g., extracurricular activities) |
| Pape (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 179 students enrolled at Regional Community College in Texas | Survey | Cross-sectional | Thoughts of discontinuing |
| Cuschieri et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Malta | 172 pre-clinical medical students at the University of Malta (first two years of a five-year degree) | Survey | Cross-sectional | Reduced academic performance Uncertainty around assessments and exams Concerns about future employability Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Reduced interactivity with peers eExam stress / distrust Impacted study habits Reduced possibilities for student life (e.g., extracurricular activities |
| Barik et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | All elective surgeries cancelled & residents moved to other departments | India | 158 junior and senior orthopaedic residents of seven tertiary care centres. | Survey | Cross-sectional | Impoverished teaching, learning, assessment |
| Händel et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Germany | 1826 undergraduate and postgraduate students from all faculties who had not yet participated in their first online course at a German University | Survey | Cross-sectional | Lack of skills in technology use by students |
| Durak & Çankaya (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Turkey | 32 students from various disciplines who took their lessons via distance education during the pandemic process at 4 different universities in Turkey | Survey semi-structured interviews | Cross-sectional | Impoverished teaching, learning, assessment  Reduced academic performance Inconsistency in teaching approaches Reduced interactivity with teachers Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Reduced motivation Reduced social support Reduced possibilities for student life (e.g., extracurricular activities) |
| Chung et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Malaysia | 399 online and distance learning undergraduate students (enrolled in Business and Economics courses) at the largest university in Malaysia | Survey | Cross-sectional | Inconsistency in teaching approaches Lack of focus / concentration / cognitive ability Reduced motivation Limited access to technology or internet Lack of skills in technology use by students |
| Murphy et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 148 undergraduate students from a liberal arts college in Maine, USA | Survey | Cross-sectional | Increased workload Inconsistency in teaching approaches Reduced interactivity with teachers Disorganized teachers Perceived lack of care or empathy from university staff Reduced motivation Reduced interactivity with peers Reduced engagement |
| Elmer et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Switzerland | 266 Swiss undergraduate engineering and natural sciences students experiencing the crisis (N = 212). Additional comparisons are made to an earlier cohort which did not experience the crisis (N = 54). | Survey | Naturalistic comparison study | Concerns about future employability Financial hardships Reduced interactivity with peers Reduced social support |
| Mahdy (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | 92 countries  (36% Asia; 32% Africa; 21% Europe; 5% North America; 4% Oceania; 3% South America) | 1392 veterinary medical students and researchers | Survey | Cross-sectional | Impoverished teaching, learning, assessment Reduced academic performance Inability to attend practical classes / obtain practical experience Inconsistency in teaching approaches Reduced interactivity with teachers Physical risks Psychological risks (e.g., anxiety) Reduced motivation Reduced interactivity with peers Reduced social support Reduced engagement eExam stress / distrust Limited access to technology or internet |
| Radu et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Romania | 135 students from the Faculty of Engineering (n=99) and the Faculty of Physical Education and Sports (n=36) at Vasile Alecsandri University of Bacau, Romania | Survey | Cross-sectional | Inability to attend practical classes / obtain hands-on experience Reduced interactivity with teachers Physical risks Psychological risks (e.g., anxiety) Reduced motivation Reduced interactivity with peers Reduced social support eExam stress / distrust Limited access to technology or internet |
| Korkmaz & Gürses (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Turkey | 70 students in graduate anatomy education courses (MSc, PhD, Residency) at Istanbul University | Survey | Cross-sectional | Impoverished teaching, learning, assessment Inability to attend practical classes / obtain hands-on experience Inconsistency in teaching approaches Difficulties around accessing campus / facilities / services Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university |
| Agius et al. (2021) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Malta | 88 undergraduate and postgraduate students at the Faculty of Dental Surgery at the University of Malta | Survey | Cross-sectional | Concerns about academic delays Uncertainty around assessment and exams Inability to attend practical classes / obtain practical experience Inconsistency in teaching approaches Inadequate study spaces Difficulties around accessing campus / facilities / services Concerns about future employability Reduced motivation Reduced social support |
| Stanković et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Serbia | 58 first year students who attend the Faculty of Sports and Physical Education at the University of Nis | Survey | Cross-sectional | Increased workload Disorganized teachers Reduced motivation |
| Azlan et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Malaya | 11 students in the Master of Medical Physics programme at the University of Malaya in Kuala Lumpur | Survey | Cross-sectional | Inability to attend practical classes / obtain hands-on experience Reduced interactivity with teachers Increased distractions Difficulties around accessing campus / facilities / services Reduced motivation eExam stress / distrust Limited access to technology or internet |
| Kecojevic et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 162 undergraduate students at a public university in New Jersey enrolled in an introductory Public Health subject | Survey | Cross-sectional | Lack of focus / concentration / cognitive ability Limited access to technology or internet |
| Kubina et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Russia | 32 undergraduate students from various universities in the city of Yekaterinburg (Russia). | Interviews Survey | Cross-sectional | Increased workload Inconsistency in teaching approaches Reduced interactivity with teachers Challenges associated with different time zones Lack of focus / concentration / cognitive ability Physical risks Psychological risks (e.g., anxiety Reduced motivation Reduced engagement Impacted study habits Discomfort associated with intrusion into students' home environment (e.g., classes via Zoom) Limited access to technology or internet |
| Mollenkopf et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 58 undergraduate teaching students at a Midwestern University in the USA | Survey | Cross-sectional | Inability to attend practical classes / obtain practical experience Increased distractions Inadequate study spaces Limited access to technology or internet |
| Choi et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | UK | 440 final year medical students from 32 UK medical schools | Survey | Cross-sectional | Paused or cancelled studies Inability to attend practical classes / obtain practical experience Financial hardships |
| Unger & Meiran (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | USA | 82 undergraduate students from across majors and academic years at Wingate University | Survey | Cross-sectional (although one follow- up question was asked of the same students two weeks later) | Impoverished teaching, learning, assessment Reduced academic performance Inability to attend practical classes / obtain practical experience Reduced interactivity with teachers Impoverished transition Reduced memory Inadequate study spaces Reduced interactivity with peers Lack of skills in technology use by students |
| Aristovnik et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | 62 countries  (44.9% Europe, 23.7% Asia, 14.4% South America; 8.6% Africa; 7.8% North America; 0.6% Oceania) | 30383 higher education students | Survey | Cross-sectional | Reduced academic performance Increased workload Inconsistency in teaching approaches Trouble accessing class or learning materials Lack of focus / concentration / cognitive ability Limited access to technology or internet |
| Abdi et al. (2020) | Pandemic | COVID-19 | Lengthy - most of a year or more | Move to emergency online delivery | Turkey | 773 undergraduate students | Survey | Cross-sectional | Reduced engagement |
| Richardson et al. (2015) | Natural disaster | Earthquake in Christchurch, New Zealand | Significant - 36 months | Significant damage to infrastructure - relocate teaching sessions | New Zealand | 290 undergraduate and postgraduate nursing students | Survey | Cross-sectional | Paused or cancelled studies Lack of focus / concentration / cognitive ability Physical risks Psychological risks (e.g., anxiety) Reduced motivation |
| Collings et al (2018) | Natural disaster | Earthquake in Canterbury New Zealand | Moderate - 6 months | Campus closed (1 week, 4 weeks, 1 week); reorganisation of teaching schedule; somes students changed institutions (permanently or temporarily) and some delayed studies. Gradual reopening of university buildings | New Zealand | 229 first-year undergraduate students in a Biology course | Course grades Survey | Cross-sectional | Impoverished teaching, learning, assessment Paused or cancelled studies |
| Injejikian (1995) | Natural disaster | Earthquake in California | Moderate - 4 months | Not specified | USA | 241 undergraduate students from two California state universities, one which was affected by the earthquake (n=131) and one which was not (n=110) | Survey | Naturalistic comparison study | Concerns about academic delays Reduced academic performance Lack of focus / concentration / cognitive ability Increased distractions Inadequate study spaces Difficulties around accessing campus / facilities / services Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Reduced motivation |
| Mok et al. (2016) | Natural disaster | 2011 Tornado in Alabama | Moderate - a few weeks | Final examinations suspended and new examination policy issued | USA | 3804 undergraduate and graduate business administration students at the University of Alabama | Survey | Cross-sectional | Reduced motivation |
| Carales & López (2021) | Natural disaster | Hurricane Harvey | Moderate - a few weeks | Closure of schools | USA | 15 community college students from various majors | Focus groups Interviews | Cross-sectional | Paused or cancelled studies Lack of focus / concentration / cognitive ability Displacement Financial hardships Perceived lack of care or empathy from university staff Changed opinions about peers / teachers |
| Crawford et al. (2008) | Natural disaster | Hurricane  Katrina | Moderate - approximately 1 month | University and affiliated hospital closed and the undergraduate medical education program moved to Houston TX. | USA | First, second, third, and fourth year students (sample size not specified) enrolled at Tulane School of Medicine | Standardized exams | Pre/post-test quasi experimental | Reduced academic performance |
| Wynne et al. (2018) | Natural disaster | Hurricane  Sandy;  snowstorms | Short - approximately a week or two | Universities closed, classes were either moved online or make up classes were delivered when the university reopened | USA | Students from two New York Business Schools (one urban and one suburban). 519 for Hurricane Sandy;  441 for the series of snowstorms | Survey | Naturalistic comparison study | Paused or cancelled studies Concerns about future employability  Financial hardships |
| Silva-Suarez et al. (2020) | Natural disaster | Hurricane  Maria | Moderate - 5 weeks | Adapted curriculum | USA | 150 first, second, third, and fourth professional year student pharmacists. | Survey | Cross-sectional | Concerns about academic delays Reduced academic performance Lack of focus / concentration / cognitive ability Inadequate study spaces Difficulties around accessing campus / facilities / services Financial hardships Physical risks Psychological risks (e.g., anxiety) Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university |
| Joshi & Fynewever (2019) | Natural disaster | Earthquake in Kathmandu | Moderate - 7 weeks | Kathmandu University (KU) closed | Nepal | 499 students at Kathmandu University’s main campus | Survey | Cross-sectional | Uncertainty around assessments and exams Perceived lack of care or empathy from university staff Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university |
| Doyle et al. (2017) | Natural disaster | Superstorm Sandy | Moderate - up to 6 months | Not specified | USA | 281 full-time undergraduate students attending Monmouth University | Survey | Cross-sectional | Reduced academic performance Physical risks Psychological risks (e.g., anxiety) Reduced motivation |
| Rosenthal et al. (2014) | Natural disaster | Hurricanes Gustav and Ike | Short - 10 class days | Move to emergency online delivery | USA | 218 undergraduate students in a range of disciplines at a comprehensive, regional institution | Survey | Cross-sectional | Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university Limited access to technology or internet |
| Ceyhan & Ceyhan (2007). | Natural disaster | Earthquakes in Marmara, Turkey | Lengthy - most of a year or more | Not specified | Turkey | 407 undergraduate university students attending various departments at Anadolu University and Osmangazi University, in Turkey | Survey (6 years after crisis) | Cross-sectional | Reduced academic performance Displacement Financial hardships |
| Madsen et al. (2013) | War | Ground offensive in Gaza | Short - approximately 1 week | Medical school cancelled classes | Israel | 66 medical students (in Year 4, or first- or second-year residents) | Survey | Cross-sectional | Displacement Changed opinions about peers / teachers Stress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from university |
| Halboub et al. (2019) | War | Yemeni civil war | Lengthy - most of a year or more | Unspecified | Yemen | 1051 first to fifth year dental students at the two main dental faculties in Yemen (1 public and 1 private) | Survey | Cross-sectional | Increased workload  Limited access to technology or internet |
| Linsenmeyer & Lucas (2017) | Social or political | Ferguson Missouri civil unrest / riots / protests due to the fatal shooting of Michael Brown by police officer Darren Wilson. | Moderate - 4 months | Faculty had latitude to cancel or adjust their courses | USA | 19 undergraduate and graduate students attending Saint Louis University | Survey Semi-structured interviews | Cross-sectional | Lack of focus / concentration / cognitive ability Perceived lack of care or empathy from university staff Changed opinions about peers / teachers |
| Shafieyan (1983) | Social or political | Iranian - US hostage crisis | Lengthy - most of a year or more | None | USA | Iranian students from various disciplines, colleges and universities (180 survey, 12 interview) | Interviews  Survey | Cross-sectional | Concerns about academic delays Concerns about future employability Perceived lack of care or empathy from university staff Changed opinions about peers / teachers |