**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 teacherReduced 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 teacherPhysical risksPsychological risks (e.g., anxiety)Reduced interactivity with peersReduced social supportReduced 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 assessmentTrouble accessing class or learning materialsInadequate study spacesImpacted study habitsLimited 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 risksPsychological risks (e.g., anxiety)Reduced motivationReduced 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 delaysPaused 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 andTechnology.  | Survey  | Cross-sectional | Impoverished teaching, learning and assessmentPhysical risksPsychological riskseExam 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 experienceTrouble accessing class or learning materials Inadequate study spacesConcerns about employabilityPhysical risksPsychological risks (e.g., anxiety)Reduced interactivity with peersReduced social support Reduced engagementLimited 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, assessmentIncreased workload Uncertainty around assessments and examsInability to attend practical classes / obtain hands-on experienceReduced interactivity with teachersTrouble accessing class or learning materialsDisorganized teachersInability to do group work Lack of focus / concentration / cognitive abilityIncreased distractionsInadequate study spacesPhysical risks Psychological risks (e.g., anxiety)Stress confusion caused by inadequate planning or poor / infrequent / inconsistent communication from universityReduced motivationReduced interactivity with peersReduced social supportReduced engagementeExam stress / distrust Limited access to technology or internetLack of skills in technology use by studentsTechnology 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 delaysImpoverished teaching, learning, assessmentReduced academic performance Increased workloadUncertainty around assessments and examsInability to attend practical classes / obtain hands-on experienceInconsistency in teaching approachesDisorganized teachersConcerns about future employabilityStress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from universityLimited 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, assessmentInability to attend practical classes / obtain hands-on experienceInconsistency in teaching approachesReduced interactivity with teachersLack of focus / concentration / cognitive abilityReduced memoryInadequate study spacesTechnology 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 delaysUncertainty around assessments and examsInability to attend practical classes / obtain hands-on experienceImpoverished transitionConcerns about future employabilityPhysical risksPsychological risks (e.g., anxiety)Reduced social supportImpacted study habitsReduced 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 teachersReduced interactivity with peersTechnology 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 performanceInability to attend practical classes / obtain hands-on experience Lack of focus / concentration / cognitive abilityImpacted 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 materialsImpoverished transitionLack of focus / concentration / cognitive abilityIncreased distractionsInadequate study spacesReduced interactivity with peersReduced 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 performanceUncertainty around assessments and examsConcerns about future employabilityStress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from universityReduced interactivity with peerseExam stress / distrustImpacted study habitsReduced 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  | Surveysemi-structured interviews | Cross-sectional | Impoverished teaching, learning, assessment Reduced academic performanceInconsistency in teaching approachesReduced interactivity with teachersStress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from universityReduced motivationReduced social supportReduced 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 approachesLack of focus / concentration / cognitive abilityReduced motivationLimited access to technology or internetLack 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 workloadInconsistency in teaching approachesReduced interactivity with teachersDisorganized teachersPerceived lack of care or empathy from university staffReduced motivationReduced interactivity with peersReduced 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 employabilityFinancial hardshipsReduced interactivity with peersReduced 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, assessmentReduced academic performanceInability to attend practical classes / obtain practical experienceInconsistency in teaching approachesReduced interactivity with teachersPhysical risksPsychological risks (e.g., anxiety)Reduced motivationReduced interactivity with peersReduced social supportReduced engagementeExam stress / distrustLimited 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 experienceReduced interactivity with teachersPhysical risksPsychological risks (e.g., anxiety)Reduced motivationReduced interactivity with peersReduced social supporteExam stress / distrustLimited 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, assessmentInability to attend practical classes / obtain hands-on experienceInconsistency in teaching approachesDifficulties around accessing campus / facilities / servicesStress / 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 delaysUncertainty around assessment and examsInability to attend practical classes / obtain practical experienceInconsistency in teaching approachesInadequate study spacesDifficulties around accessing campus / facilities / servicesConcerns about future employabilityReduced motivationReduced 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 workloadDisorganized teachersReduced 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 experienceReduced interactivity with teachersIncreased distractionsDifficulties around accessing campus / facilities / servicesReduced motivationeExam stress / distrustLimited 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 abilityLimited 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).  | InterviewsSurvey | Cross-sectional | Increased workloadInconsistency in teaching approachesReduced interactivity with teachersChallenges associated with different time zonesLack of focus / concentration / cognitive abilityPhysical risksPsychological risks (e.g., anxietyReduced motivationReduced engagementImpacted study habitsDiscomfort 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 experienceIncreased distractionsInadequate study spacesLimited 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 studiesInability to attend practical classes / obtain practical experienceFinancial 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, assessmentReduced academic performanceInability to attend practical classes / obtain practical experienceReduced interactivity with teachersImpoverished transitionReduced memoryInadequate study spacesReduced interactivity with peersLack 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 performanceIncreased workloadInconsistency in teaching approachesTrouble accessing class or learning materialsLack of focus / concentration / cognitive abilityLimited 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 studiesLack of focus / concentration / cognitive abilityPhysical risksPsychological 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 gradesSurvey  | Cross-sectional | Impoverished teaching, learning, assessmentPaused 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 delaysReduced academic performanceLack of focus / concentration / cognitive abilityIncreased distractionsInadequate study spacesDifficulties around accessing campus / facilities / servicesStress / confusion caused by inadequate planning or poor / infrequent / inconsistent communication from universityReduced 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 groupsInterviews | Cross-sectional | Paused or cancelled studiesLack of focus / concentration / cognitive abilityDisplacementFinancial hardshipsPerceived lack of care or empathy from university staffChanged opinions about peers / teachers |
| Crawford et al. (2008) | Natural disaster  | HurricaneKatrina | 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 studiesConcerns 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 delaysReduced academic performanceLack of focus / concentration / cognitive abilityInadequate study spacesDifficulties around accessing campus / facilities / servicesFinancial hardshipsPhysical risksPsychological 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 examsPerceived lack of care or empathy from university staffStress / 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 attendingMonmouth University | Survey | Cross-sectional | Reduced academic performancePhysical risksPsychological 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 universityLimited 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 performanceDisplacementFinancial 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 | DisplacementChanged opinions about peers / teachersStress / 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  | SurveySemi-structured interviews | Cross-sectional | Lack of focus / concentration / cognitive abilityPerceived lack of care or empathy from university staffChanged 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) | InterviewsSurvey | Cross-sectional | Concerns about academic delaysConcerns about future employabilityPerceived lack of care or empathy from university staffChanged opinions about peers / teachers |