THE COVID-19 PANDEMIC'S IMPACT ON STUDENTS IN A PARAMEDIC STUDY PROGRAM

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ABSTRACT

Pandemics and other natural disasters impact paramedic students differently based on students' personal circumstances such as family situation, age, and maturity level as well as academic circumstances such as mode of course delivery. This study examines the impact of the COVID-19 pandemic on 38 Emergency Medical Services students who were studying in face-to-face programs, which required labs and clinicals, when they were forced to go completely online. The students responded to five questions about the impact of the pandemic on their studies as part of their end-of-course evaluations, and their responses were examined using thematic analysis. Students were affected by the interruption of classes and also by changes in their childcare and work situations. Nontraditional, older students with established jobs in emergency services agencies seemed to cope better than traditional students. Although maturity seemed to be a factor, family relationships helped students deal with the changes brought about by the pandemic. The results find that in a pandemic, hybrid courses appear to be the best option for paramedic students who take health sciences programs that require labs and clinicals.

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INTRODUCTION

As the COVID-19 pandemic began to manifest, U.S. colleges and universities (hereafter "colleges") transitioned the vast majority of their coursework from traditional face-to-face (F2F) courses to online (OL) delivery platforms. This article examines the impact of the COVID-19 pandemic on Emergency Services (ES) programs and students at Utah Valley University (UVU), in Orem, Utah. As classes ended at the conclusion of the Spring semester in April 2020, 38 students in a two-semester paramedic program were asked to respond to questions about how the pandemic impacted their education and lives. Thematic analysis was used to develop a list of lessons learned and recommendations for dealing with future disasters and pandemics. Hereafter, article headings that are followed by an asterisk (*) indicate a theme was derived from the section and used as a basis for the survey questions.

Students Were Better Prepared Than Faculty for Online Education*

Usually, change takes place over a period of months or even years, but the COVID-19 pandemic adoption of OL course delivery took only days. Instead of conducting in-person lectures in traditional F2F settings, faculty were videoconferencing and sharing slides with students from their homes via the internet. The transition was made possible partly because students are more internet savvy or are familiar with internet-based social media platforms, such as Instagram, Facebook, and Twitter. In addition, two key technologies made the process easier: videoconferencing and learning management systems (LMS). Many students had already used videoconferencing software such as Google Meet, Zoom, and Facebook Messenger.

Institutions of higher education and their faculty were less prepared than students. While many faculty members had some familiarity with digital methods of teaching, most did not. The transition to OL course delivery was a "a first-aid approach" (IEEE Spectrum, 2020). Little thought went into redesigning the courses. Instead of adopting OL discussions, using OL readings and assignments, and the catalog of open educational resources (OER), most faculty videoconferenced, using their existing lectures and PowerPoint presentations.

While the COVID-19 pandemic appears to not have the same impact on young adults as previous pandemics including the 1918-1920 Spanish flu, the 1948-1952 polio epidemic, 1957-1958 Asian flu, the 1968-1970 Hong Kong flu, the HIV/AIDS pandemic, the 2002-2004 SARS outbreak, and the 2009-2010 H1N1 pandemic, this is the first time students have been locked down and isolated from the rest of the academic population. These unique characteristics make the lessons learned from the pandemic's impact on college students and their studies even more important. A great deal can be learned from their experiences that will help planning and decision making for future pandemics and disasters.

Background

Emergency Medical Services (EMS) education (including EMT [emergency medical technician], Advanced EMT, and paramedics) is similar to other healthcare programs in that it is typically taught F2F and includes labs and clinicals. It is different from EMS leadership and emergency management programs, which typically do not have labs, and are easily adapted to OL course delivery.

In Utah, the Bureau of EMS requires labs to be supervised by a state-certified instructor at a ratio of one instructor to every six students. Lead instructors (usually full-time faculty) are required to be present in the classroom and laboratory for 75% of the instruction. At UVU, about 20% of the background information had been offered OL in a flipped classroom format: Students used LMS to access and read OL material and then performed activities and exercises, attended labs and clinicals, and received further explanations in the classroom. Students took examinations in a testing room developed by an approved outside agency. The first semester of paramedic training is heavily supported by laboratory-based courses, and second semester training includes hospital-based clinicals and fire department paramedic ride-alongs. Following the successful completion of the second semester, passing students are recommended to take the Paramedic National

Registry Exam. UVU paramedic students pass the National Registry Exam at a rate over 90% (Utah Valley University, 2019).

On March 13, 2020, Utah Governor Gary Herbert announced the closure of Utah public schools and colleges (Herbert, 2020; Tanner, 2020). Paramedic students at UVU were in the ninth week of a 15-week semester. Labs and clinicals were suspended and the courses went completely OL. In May 2020, protocols were developed at UVU allowing students to take exams and complete labs on site so long as they socially distanced and wore appropriate face masks.

LITERATURE REVIEW

Students Prefer Face-to Face Course Instruction Over Online Course Delivery

Tophat's (2020) survey of 3,089 students found that they were uncertain about returning to college. Students found it difficult to learn effectively OL. Eighty-five percent of students said that they missed the personal interaction with faculty and 86% said they missed contact with other students. Fifty-three percent said that they did not have regular access to faculty and 69% said that they did not have regular access to other students. Students generally felt anxious (52%), had concerns about finishing (40%), and passing the semester (50%). Many students (68%) felt that OL course delivery was not as good as F2F instruction. Some had difficulty using OL tools (28%) and accessing OL materials (22%). Fifty percent indicated they spent less time on their courses. The good news is that many students liked the flexibility of OL learning. More than one in three (36%) preferred a blended course, 48% preferred independent asynchronous OL courses, and 41% favored real-time synchronous OL learning. A quarter of the students had doubts whether they would return to school in the Fall.

Not All Student Have the Tools to Learn Online

A Spring 2020 survey at Benedictine University found that 95% of 421 students had access to a computer at home, but only 75% had access to high-speed Internet. According to the author, "the real issue for some college students is reliable access to the internet" (Lakin, 2020). The actual digital divide between students is not computers but access to reliable Internet service. Without high-speed internet, students are unable to do schoolwork OL. A PEW Research Study (Horrigan, 2015) found that of families with school-age children earning under $50,000 annually, 31.4% lacked high-speed internet at home; the percentage without high-speed Internet access was higher among Black (38.6%) and Hispanic (37.4 %) families.

Different Disasters Require Different Response: One Common Requirement to Assure Resilience Is Preparedness*

The impact of disasters and pandemics on college students and their studies has been researched previously. While each disaster increases the knowledge of how students cope under extreme situations, each event is unique and requires special consideration. Joshi et al. (2018) found culturally and socioeconomically different contexts required flexibility from faculty to meet

student needs when disasters threatened normal classroom learning. Actions must be specific in terms of scheduling changes, handling stress, and adapting course delivery to OL learning.

Disasters Bring About Organizational Change

Wang and Hutchins (2010) studied the Virginia Tech shooting in 2007 using Mitroff's crisis management model. They discovered that the best prepared organizations have developed a crisis management approach that reflects the organization's complexity and is adaptable over time. When a crisis does occur, the organization was likely to recover faster if the disaster was managed by a well-trained interdepartmental crisis management team. Crisis events often led to organizational change. It was the management teams' responsibility to see that organizational change was shaped to foster desired outcomes.

Shaw (2017) studied the impact of hurricanes on two colleges in terms of disaster recovery process and return to normal operations, which he described as the post-disaster pathway to organizational equilibrium. The study was based on the belief that organizational change can occur from "the natural cycle of managing a disaster." When managing a crisis, institutions should consider response and recovery as a series of actions that lead to two interdependent goals: recovering and reaching organizational equilibrium. Disaster response and recovery actions that do not keep the institutional mission and values as the center of the disaster management process run the risk of moving the organization further away rather than closer to equilibrium.

Restoring Communications Should Be a Top Priority for Quick Recovery

Jarrell et al. (2008) considered issues affecting students and faculty after Hurricane Katrina. The authors found that colleges did not appear to be prepared for major disasters. At the time, in 2005, few colleges had crisis management teams or crisis management programs. Hurricane Katrina forced the introduction of distance-learning programs, using LMSs that allowed students to have OL discussions, email documents to instructors, and view feedback and grades. Distance learning allowed students to reach out to each other. Social contact increased. Students relied on faculty for support and updates. However, the introduction of distance learning came with challenges: inexperienced faculty and unprepared students, insufficient time to develop course material, lack of advising, limited technical support, high attrition rates, and academic dishonesty.

For colleges that recovered quickest, restoring channels of communication was a top priority when disasters occurred. The best-responding colleges following Hurricane Katrina were those that developed interactive sites using blogs and message boards. Successful schools had procedures in place that assured the existence and adequacy of student services. They had backed up all student records, including transcripts, test scores, financial aid, school accounts, email information, and cell phone numbers. The backed-up information permitted reaching out to students and opening lines of communication.

In Order to Provide Fast Changeover from Face-to-face to Online Course Delivery, Universities Benefit from an Established Internet-Based Learning Management System*

SchWeber (2008) examined the disaster responses of two colleges: Empire State University, which modified its Lebanon programs in response to conflict by providing DVDs of lectures, and Xavier University, which adopted a Sloan Semester to respond to the interruption of studies brought about by Hurricane Katrina. Both followed principles of resilience and survival, by communicating quickly and honestly with stakeholders and building upon existing technological systems and the digital environment. They adopted OL learning, using a strong technology infrastructure (LMSs), multi-media tools, and chat to provide immediate and long-term solutions. They collaborated with existing networks and adopted and created solutions as the situation developed.

Institutions and Their Programs Benefit from the Establishment of Pre-Disaster Relationships*

Medical students at Tulane University in New Orleans were able to resume classes and clinical rotations less than four weeks after Hurricane Katrina closed their campus. The medical school moved to Houston, Texas, with the help of the Baylor College of Medicine and the Alliance of South Texas Health Sciences Center. Accomplishing a move of this size required cooperation, careful planning, and vision; it also depended upon the establishment of pre-disaster relationships that were called upon when the disaster occurred (Kahn et al., 2006).

Colleges Have the Potential to Be Centers of Infection*

Van et al. (2010) found that colleges have the risk of becoming "explosive disease outbreak centres" in a pandemic. The authors came to these conclusions from a study of perceptions and responses from staff and students following the swine flu (H1N1) epidemic in 2009, where at one time or another up to a third of university students were out with flu-like symptoms (Richardson, 2020). The estimated death toll worldwide from swine flu ranged from 284,500 to as many as 579,000 people, affecting children mostly in developing countries of Africa (Begley, 2012). Van et al (2010) found that outbreak management is needed to protect colleges and local communities from future pandemics.

TEACHING DURING DISATERS*

Holzweiss et al. (2020) examined the impact of Hurricane Harvey in Fall 2017 on students at Sam Houston State University. While F2F students were not impacted, more than 1,000 students lost internet access because of the storm and were in danger of dropping out. The university postponed OL classes for several weeks, allowing time for internet service to be restored.

Treadwell (2016) studied the impact of high-profile disasters on student affairs officers. While nothing can prepare for the reality of a campus tragedy, through training administrators can learn to respond appropriately no matter the hazard they face: administrators need to learn to deal with the potential emotional impact of a crisis; they also need to plan for the seemingly small

technical details that help in campus restoration; and, finally, they need to learn from these experiences so that future disasters can be avoided or mitigated.

L'Orange (2010) reported that unplanned catastrophes have an effect on enrollment, but the overall impact appeared to be minimal or temporary. Enrollment numbers started from a new, lower base but soon returned to prior levels, demonstrating the resilience of students and institutions. DePietro (2020) predicted that commuter schools may be the best suited to survive the COVID-19 pandemic, since parents may be afraid to send their children to live in on-campus housing. Also, community colleges have smaller classes, which are best suited for managing the spread of the coronavirus through social distancing.

Institutions Were Able to Quickly Transition from Face-to-Face to Online Course Delivery and Testing Proved to Be One of the Weakest Elements in the Change to Online Course Delivery*

Ruiz et al. (2006) extolled the virtues of e-learning in medical education. They found that when combined with traditional teacher-led activities, e-learning had proved to be extremely effective. Repositories of e-learning materials existed for use in teaching and course development. They recommended evaluating e-learning through a peer-review process and assessing outcomes such as learner satisfaction, content usability, and demonstration of learning. While they did not predict the explosion in e-learning because of circumstances like a pandemic, they did see that it would lead to a shift toward adult learning in medical education. Medical educators no longer control content; rather, they facilitate learning.

Johnson et al. (2020) investigated the transition to remote teaching in the early weeks of the COVID-19 pandemic at post-secondary institutions in the United States. Of the 672 U.S. institutions reporting, almost all transitioned to emergency teaching and learning approaches. Faculty learned to teach OL as they turned from classroom to OL instruction. Many faculty members with previous OL experience adopted new approaches. Faculty changed their assignments and exams as they moved to OL delivery. Almost half reported decreasing the volume of work for students by dropping assignments or exams and others shifted to a pass/fail model for the semester. Faculty and administrators identified three areas of primary need: assistance related to student support, more availability to OL digital materials, and guidance for working from home.

As the impact of COVID-19 became evident, UCLA's Davis et al. (2020) shared best practices by video conference to medical and other healthcare institutions and faculty. They found there was no time to redesign the entire program as they moved to OL delivery. They recommended the use of OL skill learning platforms, such as ReelDX, a video system that takes a student bedside or on scene in a prehospital setting with real people in real situations. Faculty are able to pick from a library of thousands of videos with specific learning opportunities. Also, video conferencing tools such as Zoom freed up time for the instructors and kept them focused on student outcomes, specifically case-based learning that had higher-level learning objectives. Video conferencing allowed small group instruction, which proved to be valuable by providing far more interaction between students and faculty. Faculty could focus on students who needed

more of their time. Students had less opportunity to sit back and avoid participation, as seen in groups of F2F learning labs. Students had a higher level of involvement. Assignments were divided into groups of two, presenting findings and definitions. This approach allowed early identification of gaps in learning. Feedback provided a much deeper cognitive learning experience. Because of student creativity, the desired learning objectives were achieved despite the lack of equipment and tools. Davis et al. predicted that when students return to skill-based opportunities, they will likely function at a much better level due to OL learning skills instruction.

In the OL classroom, Davis et al. (2020) indicated it was more difficult to monitor the well-being of students and identify early alerts. Course evaluations were modified, using student self-assessments to identify issues rather than employing the standard instructor evaluation. This self-assessment was reflective and permitted an instructor to understand the issues facing each student and allowed for individualized course evaluation (grading with a heart and brain). The authors indicated that the common use of proctored exams and testing was an issue for many. Remote proctoring did have some challenges as they began to use camera-based systems like Proctorio. Test integrity was often at odds with course goals. For example, many programs considered testing at a later date while others instituted OL testing with mini exams in a rapid response requirement as the method to protect core values of integrity. The authors found that students and faculty faced problems of sharing technology with younger children who were also studying at home.

Chapman and Piette (2020) provided guidelines for delivering EMS instruction during the COVID-19 pandemic. They recommended the use of synchronous OL learning to allow students to access information at any time; synchronous OL learning typically uses teleconferencing software to provide live stream materials. Instructors can share their current lessons as in a F2F class. They found that F2F lab experience was difficult to simulate OL. Campuses that allowed lab experience were limiting the number of students. Hospital clinical and field internships have generally been curtailed because of hospital policies not allowing visitors. OL studies lacked needed hardware, broadband internet access, and knowledge of learning platforms.

Extensions were given to students who were not able to take the National Registry Exam for EMTs, Advanced EMTs, and Paramedics due to quarantine or other impacts from COVID-19 (Sefarth, 2020). Virtual Instructor-Lead Training (VILT) outside the classroom satisfied the requirements for instructor-led training. Psychomotor examinations were administered under the guidance of local health authorities. Cognitive examinations from Pearson's OnVUE proctoring system were made available based on local health guidelines. Where suspension of classes impacted learning labs, practicums, and clinical experiences, students were provided extensions to complete their programs.

POST-PANDEMIC IMPACT ON EDUCATION

Community college officials such as those in Lorain County Community College in Ohio (Guth, 2020), predicted that the demand for healthcare jobs would increase following the pandemic. As

a result, programs continued to operate during the crisis. Students were permitted to complete clinicals when healthcare facilities reopened.

DePietro (2020) suggested that after the pandemic, finances and distance may also be a consideration when choosing a university. He predicted that students are more likely to choose nearby state schools and community colleges. The trend may also be toward OL schools. While many institutions have taken their courses OL, those schools with previously developed OL programs have an advantage over schools that have to catch up.

Soland et al. (2020) found that K-12 educators indicated concern that the loss of schooling forced by COVID-19 would lead to a decrease in learning. They predicted that students beginning their studies in the Fall 2020 semester would begin with only 70% of the learning gains in reading from the prior year relative to what they would have learned in a typical year. The impact would be even more drastic on mathematics learning gains, where students might begin the year at a 50% level. The estimates were made for students from grades 3-8. The impact was predicted to be even greater on underserved communities.

The impact of COVID-19 pandemic has not been limited to the United States. Institutions in developed countries have adapted to changes brought about by the pandemic by offering OL education. In developing countries, partly because of the lack of infrastructure, the change to OL programs has lagged behind. The challenges for students have been similar across the globe. For example, high school students in Victoria, Australia, were concerned about how the disruption in studies would affect their rankings for admission into colleges (Victoria, 2020). COVID-19 disrupted the plans of Panjab University's engineering students who were looking to join their first company in June after finishing internship and training by mid-May (Kapur, 2020).

PROBLEM STATEMENT

For the first time in history, a disaster—the COVID-19 pandemic—required the lockdown and isolation of the public, including K-12 and post-secondary students. The public was told to socially distance, shelter in place, and lockdown unless they were essential workers. Sick and asymptomatic persons who tested positive for COVID-19 were required to quarantine. OL education became the mainstay of all U.S. education. This study examines the impacts of social isolation and family dynamics on OL course delivery for students studying in a college-level emergency services program. The study attempts to answer the following question: What was the impact of the COVID-19 pandemic on students who were required to move from studying in a F2F paramedic class to OL course delivery? To explore this topic, students were asked to respond in narrative form to five survey questions.

STUDENT SURVEY QUESTIONS/PROMPTS

1. Describe any problems in your personal or work life that have made doing your schoolwork more difficult.

2. Describe your experiences in relation to your original understanding of your courses and their delivery and the subsequent changes that have impacted your learning expectations.

3. Describe any accommodations (assignment modifications, due date extensions, retests, etc.) you have received and expand on any gaps you feel could have been filled based on your circumstances.

4. Add a story that tells about your experience (or your family's) in dealing with COVID-19.

5. Based on your experiences, share additional information related to you or your family's situation and/or how you envision your future educational goals being met due to COVID-19.

METHODOLOGY

During the final course evaluation, students were asked to respond to five questions about the impact of COVID-19 pandemic on their studies and lives. The students ($n = 36$) were in a two-semester paramedic program. All students were upper division, mainly seniors. The first group of students ($n=17$; 16 males, 1 female) were first-semester students who were taking 19 course credits. The second group ($n = 19$; 14 males, 5 females) were in their second semester, which required hospital clinicals and fire department ride-alongs. Almost half of the students were on leave from their work as firefighters and EMTs. To maintain anonymity, respondents were identified by their initials.

The student responses were analyzed using descriptive techniques, allowing the researchers to explore the perception and themes about the benefits and challenges of using wikis (Sharp & Whaley, 2018). A qualitative approach was used because it provides rich data. Rich data (also described as "thick description") is important when the number of respondents is limited, as in this study: "Thick description seeks to present and explore the multifaceted complexities of the situation being studied" (Marx, 2008). Rigor is measured by saturation. As data within a category overlaps, understanding of the phenomenon becomes stronger. Researchers realize saturation as they become aware that the data comprehensively or completely describes the phenomenon. Also, they note that responses begin to be repetitive, duplicating topics and stating the same thing although in different words (Morse, 2015). It is through this process that themes are developed.

Content analysis was used to examine the student submissions about crisis communication plans (Bengtsson, 2016); thematic analysis was used to study student responses (Castleberry & Nolen, 2018; Kannaley et al., 2019; Talbot et al., 2020). The following steps were used to complete the analysis.

- Themes were extracted from the literature review, which formed the framework for analysis.

- Responses were listed in a table under each question.

- Keywords were highlighted and counted within the responses.

- Keywords were used to identify quotations.

- Quotations were used to write a narrative.

- Summary statements were produced from the narrative.

- Themes were developed and compared to themes from the literature review.

- The conclusion section identified the most salient themes based on the student experiences and lessons learned were formulated.

FINDINGS

For each question, this section counts the keywords found in the student responses, provides a narrative written from quotations, and lists the themes derived from the narratives.

1.   Describe any problems in your personal or work life that have made doing your schoolwork more difficult.

Table 1 shows keywords from first semester students for Question 1. Keywords are grouped in five theme headings. Following each keyword is the number of times the word was found in the transcript. Zero (0) counts were included as the researchers expected to observe the word.

Table 1.   Keywords from student responses for Question 1

Theme headings	Keywords followed by number found in transcript
Pandemic	COVID-19 (5) virus (1) coronavirus (0) disease (0) pandemic (4) illness (0) sick (0)
Work	policies (2) procedures (1) protocol (1) work (51) working (5) job (12) income (3) finance (0) department (1) station (1) fire (3) paramedic (3)
Family	family (10) children (0) kids (5) son (0) daughter (0) girl (2) boy (0) wife (4) boyfriend (2) girlfriend (1)
School	OL (7) homework (3) schoolwork (7) schoolwork (4) test (2) learning (4) style (2)
Other impacts	mental (2) fear (0) anxiety (1) uncertainty (0) demands (0) challenge (3) problems (4) motivation (2) priority, prioritize (2) schedule (7) expected (4) interaction (1) relationship (1) strain (1)
Totals	**2,504 words / 17 students = average 147 words each**

Narratives for Question 1

The following contextualized statements represent students' responses to Question 1:

- For at least eight of the first-semester students, transitioning from F2F to OL studies meant that they would be available to go back to work as full-time firefighters and EMTs. However, balancing full-time work, with OL studies and family, proved to be difficult.

  o Two students complained that new policies and procedures made their work more difficult. One firefighter/EMT said, "COVID-19 has caused my work life to become more complicated because as a front-line worker we are at high risk for becoming infected. This has caused us to have constantly changing protocols to keep us safe."

  o Another firefighter/EMT said that a new COVID-19 guideline mandated that only one medic go into a residence, leaving the other outside. This limited the amount of assistance on the scene and made responding more difficult.

- Other students lost their jobs as a result of the pandemic and had to find alternate part-time jobs to make ends meet. Money was scarce for some and school was expensive. The loss of jobs/money often led to mental health problems. One student indicated that the lack of schedule and interaction with others caused her to deteriorate mentally. She wrote, "I have lost my job, my boyfriend broke up with me, school is now all OL and my family and roommates are pretty freaked out about the virus." The added stress was compounded by additional anxiety and depression. Being quarantined made the mental health situation worse.

- The lack of human interaction created problems for some students. Student comments and thoughts included:

  o "With no meaningful human interaction, nothing feels worth doing."

  o "I missed the routine of going into class an hour early and staying an hour afterward to meet with and work with other students."

  o "I had a hard time turning this into a positive growth situation for me."

  o Two students indicated their learning styles made studying OL difficult. They preferred hands-on learning or kinesthetic learning.

- One student wrote positively about his COVID-19 experience: "I am grateful that my wife has been able to continue to work and still have time to help me when needed with technical issues from taking OL classes and for the support she gives me getting through this. Personal life has been hard at times, but my wife and I still find time to break away and do things together and all the school stuff has actually brought us closer in our relationship."

  At least six students wrote that they lacked motivation, often from a combination of difficulties scheduling OL studies and because of home pressures. Students' comments and thoughts included:

- o "Trying to get schoolwork done while on shift was next to impossible with our call load, so it fell on my days off which really took away a lot of family time. I found it very hard to stay motivated when I was at home with my kids."

  o "The study environment at home is often chaotic and makes learning much more difficult." With children home from school because of COVID-19, many students were expected to "home school, cook every meal, entertain, provide support and keep each other healthy and sane." On top of everything else, one second semester student was pregnant.

- Students preferred F2F learning over OL. Eleven students identified obstacles that made OL studies more difficult. One student could not get access to Canvas, the LMS, on his home and work computers. His cell phone was his only access to OL learning. OL procedures needed to be clarified and OL testing proved difficult. Another student found it difficult to study for the tests. He indicated he missed instructor feedback and the opportunity to prepare for tests with other students.

- Second-semester students finished their F2F class prior to the COVID-19 pandemic. Many of the students were agency-sponsored and their clinicals had been scheduled as part of their work. At least eight of the second-semester students indicated they had problems scheduling clinicals or ride-alongs with fire departments.

  o One student said that he was disappointed that he had to ride in the front of the ambulance with the driver because of a lack of personal protective equipment (PPE) for him and the full-time responders.

  o Another student expressed concerns about the lack of information regarding the consequences of incomplete clinicals.

Summary of Responses from Question 1

- While many students lost their jobs and were without means to support themselves and their families, first responders had to go back to work while continuing their studies.

- Students preferred F2F over OL delivery because of reduced contact with other students and instructors, problems with learning tools, and lack of technology and equipment. These and other challenges led to a lack of motivation among some students.

- Spouses, children, and other family members were also isolated at home, making it more difficult to study and requiring the sharing of computers, study space, and time.

- Family situations, lack of work (or more work), adapting to OL learning, and uncertainty about meeting program requirements caused stress, anxiety, and mental health challenges.

- Family support and relationships helped some students get through the lockdown and adapt to OL learning.

2. **Describe your experiences in relation to your original understanding of your courses and their delivery and the subsequent changes that have impacted your learning expectations.**

Keywords identified from the responses to Question 2 included flipped classroom–hybrid (3), communication (8), experienced instructors (5), skills and experience (8), uncertainty, transition (3), positive online (5), negative online (13), knowledge (8), and FISDAP [Field Internship Student Data Acquisition Project] (6)

Narratives for Question 2

The following contextualized statements represent students' responses to Question 2:

- Prior to closing down F2F instruction, labs, clinicals, and fire department ride-alongs, student perceptions suggested that the F2F courses were well "laid out and organized."

- Students were getting feedback from their instructors and were working with each other in groups to learn the course material and to gain the necessary experience and skills to become paramedics. OL course delivery, however, changed this: students were no longer learning from each other and now felt isolated and uncertain about course material. In addition, they were afraid of missing course information, and were scared that they were losing the knowledge and skills that they had learned earlier in the semester.

- Some students found the transition to OL course delivery went smoothly, while others felt that it was very difficult. Four students indicated that they felt uncertain. Individual comments included:

  o "I feel like there was a solid 2-week period where I was in a complete tailspin and not progressing at all."

  o "My biggest concern is how much longer this course will take.… It makes planning stressful not only for a full-time job, but also for family life."

  o "The toughest part of all this is the unknown."

  o "It is so hard to mentally stay invested in this program because no one knows when we will be able to get back on track. We have guesses and estimations but no solid answers. This has completely derailed my studying habits despite still having to take the written finals."

- Going OL was challenging for many students and seen as ineffective by others. At least one student said that he did not take OL courses because he never completed them. Now, he was uncertain about whether he would complete the paramedic program. Second-semester students also felt uncertainty related to the cancellation of clinicals and firefighter/paramedic ride-alongs. Some students wondered when and if they would have opportunities to get the experience and skills to be paramedics. Students' comments on this issue included:

- o "Being book smart does not outweigh experience and hands-on practice with scenarios and skills."

- o "Book learning can only take you so far in paramedicine without implementing that knowledge into a real time scenario … it feels very pointless."

- o "With the delivery changes to all OL and the dropping of all practical skills and discussion, it has made it really hard for me to keep my head above water."

- o "Removing all in person activity [lectures, skill breakouts, scenarios] has been extremely detrimental to the learning process."

- o "Studying on my own has me feeling like I am missing out."

- o "I have had difficulty in extracting that important learning that I am missing from not meeting together."

- o "Online class without any lecture at all made it extremely difficult. I am not good at sitting down and reading a textbook."

- o "Taking a break could lead to regression of what we learned in class and the hands-on techniques."

- Only one student indicated that he did well studying OL, partly because of his technical skills. "Honestly, I like the online stuff better than sitting in a classroom because I can go at my own pace and still keep up with what is expected. I also have more time because I do not have to drive to and from class." The student expected that OL study would help him prepare better for the National Registry Exam.

- One student wrote that the students had good communication with the instructors throughout the whole process. Several students addressed the ineffectiveness of communication, including:

  - o "FaceTime meetings and emails lead to confusion and misinterpretation."

  - o "It is hard to study as a group, and instructors are not readily available to answer questions."

  - o "My comprehension has struggled at times without having the in-class time to collaborate with my peers and instructors."

- Five second-semester students complained about the disorganization and lack of clarity of FISDAP, an OL tool that provides schedule management, skills tracking, and testing. On student said, "I expected it to be more organized and the expectations be clearer. The fact that I had to redocument all of our FISDAP was incredibly frustrating."

- The transition to OL affected some people more dramatically than others. Student comments on this issue included:

  - o "Prior to COVID-19, I feel like I was thriving and succeeding in the class."

- o "[Prior to COVID-19] I felt like I was progressing and learning a lot and it just stopped and came to a halt."

Summary of Responses to Question 2

- The transition to OL learning was difficult for some students because of uncertainty and unfamiliarity with learning methods and tools.

- Some students felt communication was less effective, leading to confusion and misunderstanding.

- Some students felt they were learning less, forgetting information, or missing practical experience because they could not meet with other students, get immediate feedback from instructors, and were not able to have labs, clinicals, or fire department rides.

3. **Describe any accommodations (assignment modifications, due dates, retests, etc.) you have received and expand on any gaps you feel could have been filled based on your circumstances.**

Keywords identified from the responses to Question 3 included flexible due dates (10 students), extensions (3), retaking tests (7), video conferencing (5), modifications (6), FISDAP problems (4).

Narratives for Question 3

Students identified several accommodations they received when F2F classes were transitioned to OL platforms. Students appreciated instructor help, particularly their flexibility.

- "due date extensions, retest capability, and some instruction changes on different assignments"

- flexible due dates for assignments, extending test deadlines, and accepting previous scores and the highest test score

- "highest FISDAP test score being applied towards our final grade"

- "towards the end of the semester things were moved up which enabled us to complete the course with minimal impact from COVID-19"

- "I feel like the instructors have been especially accommodating and understanding, much more than I expected so I have been pleasantly surprised."

- "I got the flu; it was probably the worst time to catch it … and I really appreciate the flexibility with testing times."

In the second half of Question 3, students were asked to identify gaps, problems, or deficiencies in the way the paramedic courses were taught after transitioning from F2F to OL delivery. Students identified a number strategies that could have helped fill the gaps. Two strategies

identified were using live OL lectures and holding video meetings to discuss student questions and assignments. Student comments included:

- "At least once a week Zoom, or other platform, academic meetings would have been beneficial to instruct and teach difficult subjects."

- "I think it would have been immensely helpful to meet [by video conference] and discuss a subject and clarify some questions that we get from reading."

- "Video conferencing could have been used instead of doing 'self-taught' certificates OL."

- "Having the 'Proctorio' software allowing students to be monitored while being tested has been great." However, five students described scheduling conflicts with FISDAP testing.

    o "If we could have had those charts that show what we needed and how to document everything at the beginning of the program, it would have helped us to be more focused on what was needed," wrote a second-semester student.

    o "We could have had a lot better FISDAP training from day one instead of having to spend HOURS trying to fix the things we did wrong."

    o Addressing the difficulties getting clinicals and ride-alongs, a second semester student suggested that fire departments should be trusted to certify paramedic students. "Then they should be able to evaluate our skills and pass us off." Another student liked that he was able to miss a few ride-alongs if he had worked with enough patients.

Summary of Responses for Question 3

- Students received accommodations through extending due dates, allowing for retesting and modifying assignment requirements.

- Live streaming lectures and video chats allowed students to meet OL, allowing group work and permitting feedback from instructors and other students.

- Students were able to take tests OL because of the testing software built into the LMS, but the test database, FISDAP, continued to be a problem for some.

- Students felt that fire departments should be given more freedom to offer experiential ride-alongs.

4. **Add a story that tells about your experience (or your family's) in dealing with COVID-19**

   Narratives for Question 4

Many students provided their personal stories. The following three stories were selected because they are interesting and share common themes expressed by other students.

- The first several weeks of quarantine, all of my family really took advantage of the time we had to watch TV, play X-Box and so on. We really went into a black hole of technology. My parents still worked OL but in their off time, engaged in technology alongside us kids. It took us several weeks until we realized that we were kind of numb to how unhealthy this was for us both physically and spiritually. We started investing more time in doing activities together and instead of spending more money on renting movies we would buy games or sports gear. Our family's new favorite thing to do together in our spare time is play pickle ball on our sports court. We do it most evenings now instead of watching a movie together or going to our separate dark corners of the house to play on our phones or watch TV. I have really loved getting to play with my family like this again. Because we were all so busy with school, work, and our personal hobbies, we were not really ever anything active with each other since we were much younger. It has been fun to rediscover how renewing activity with your family can be.

- I can only describe this COVID-19 time as one of discouragement, adaption, humility, and gratitude. The biggest challenge for my family has been the change in work. Before the pandemic hit, I had three jobs that helped us save for our future. That went to zero very quickly. While school changed to all OL, I found myself with ample time but little motivation. I eventually found a job and learned to adapt to my new schedule. I was humbled by the feeling of uncertainty being unemployed. The uncertainty of our Paramedic program schedule was at times, nerve racking. As I look back to being unemployed, I am grateful for the people who keep me positive, gave me work opportunities, and helped me to change my perspective and continue to progress despite the new challenges that face me.

- It has been a very strange transition from normal life into the toilet paper apocalypse. One of the policies implemented in [my] Fire Department is on any dispatch that comes in with difficulty breathing or flu-like symptoms we only send in a single person in an N95, glasses, gloves, and gown. That single person takes in only a pulse oximeter and a tympanic thermometer to assess the seriousness of the patient. If they hit certain thresholds, we either try to bring them out to fresh air or let them know they do not need to be transported.

  On one particular breathing problem we sent one paramedic on our crew inside on a difficulty breathing. About 30 seconds later as the crew is sitting on the front porch, we hear him and the family shouting to us that he needs help. Apparently as he walked in, she was sitting on the toilet and took her last breath. We checked a pulse and found she was pulseless and moved her from the bathroom to an open space in the front room. We continued to work the arrest and instead of intubating we used a King airway to avoid sputum aerosolization per our new protocol. We were able to get ROSC [Return of Spontaneous Circulation] and then made the transition from working the arrest to transporting the patient to the hospital. While in route the patient lost her pulse again and we continued to work the arrest. We again got ROSC and made it to the hospital and transferred her to their care. We later found out that she was transferred to the ICU and ended up dying 2 days later. As a crew we wanted to know if this patient had COVID-19 but due to lack of tests at the time and the patient eventually dying she was not tested. We

have had multiple possible exposures that never get tested. It has been a frustrating experience as a crew on the frontline to have so many unknowns as far as testing and changes in protocols.

We were able to adapt and overcome as a crew and were able to successfully work a full arrest inside of our new protocols even if it was not convenient. Later the same week our policies changed again to if a person achieves ROSC we stay on scene at least another five minutes before loading them into the ambulance. If they do arrest again in the ambulance, we cease all efforts and do not transfer them to the ER. Life is all about adapting to change, at work, home, and in this course. It has not been ideal to go through paramedic school during this time but all I can do is adapt and overcome.

Summary of Responses from Question 4

- Some students used the lockdown as a means of renewing and strengthening relationships.

- Students had a mixture of feelings as a result of their new learning environment and life situations— discouragement, adaption, humility, and gratitude.

- Students who worked also as first responders felt uncertainty because of the lack of knowledge about COVID-19 and the changing work requirements brought about by the pandemic.

5. **Based on your experiences, share additional information related to you or your family situation and/or how you envision your future educational goals being met due to COVID-19**

Keywords identified from the responses to Question 5 included uncertain or frustrated goals (7), uncertain future (14), education OL (3), family (11), financial difficulties (4), uncertainty about university credit (3)

Narratives for Question 5

In Question 5, students were asked if they had anything else to add. Most summarized their experiences with COVID-19 and OL studies in terms of personal goals, uncertainty about the future, and frustration because of delays in reaching their goals. Some waxed philosophical about the future of education, which they felt would be mainly OL. Here are some of their final statements.

- This statement reflects the frustration some students felt because COVID-19 has restricted their opportunities for clinicals and fire department ride-alongs. "The only way I can reach this goal is for the government issued COVID-19 regulations to ease up and for the University to allow gatherings again." Another student wrote, "I think it would be beneficial if the university starts looking outside of the box for other alternatives for our clinical times or a way to complete the times needed to do our fire department rides."

- One student described his feeling of helplessness. "Being raised with a fixed mindset instead of a growth mindset, I feel powerless." Another person wrote, "At present, I have regular contact with three people. The first is burned out and unwilling to face it. The second is comfortable in apathy and mediocrity. The third is disabled and cannot communicate." A person claimed, "COVID-19 threw a wrench in the last of my plans."

- In contrast, several students shared this sentiment, "I think that the future of my education is bright." They felt the pandemic showed how important their work as paramedics would be. One wrote: "All I know is that I'm thankful that I am a frontline/essential worker. It is comforting knowing that I will be able to continue working and be a part of helping while being able to support my family." Another wrote: "What a crazy ride—my wife has been gone the last two weeks [as an ER nurse] and I have still had to work [as a firefighter medic], as well as take care of the four kids, and do all my finals."

- Some students worried about the quality of education they were getting OL. "I'm worried that we're getting a substandard education due to the impromptu transition from face-to-face to online." Another student added, "I'm worried about getting all the class credit I was expecting from the paramedic program."

- In talking about the future of education, one student wrote: "I feel confident that infectious disease will be a more prominent topic that will be discussed so that first responders can be prepared and ready to answer the call." Another student wrote, "I just assume everything will be done online from now on until we get the all-clear." A third claimed, "I think that more things will be available online that weren't before. I also wonder how school events will be seen in the future (necessary or not)."

Summary of Responses for Question 5

- Respondents felt the COVID-19 pandemic would change the way education is taught in the future. While students were concerned about the quality of OL course delivery, they thought it will be used more than before.

- Students were concerned about getting their experiential credit. They hoped government restrictions would be lessened so they would be able to complete their program.

- As firefighter medics and future paramedics, students saw themselves making contributions to the health of their communities.

- In May 2020, restrictions were lessened. During the summer, students were able to complete their programs following strict guidelines to assure protection to themselves and to others. F2F classes resumed in the Fall with students social distancing and wearing masks. Lectures and materials were offered OL, while activities and labs were held in class.

DISCUSSION

Chart 1 used keywords to show the relationship among the student responses. Two key themes emerged: motivation and mental health. Both were clearly related. Mental health impacted motivation and motivation affected students' mental health.

Chart 1.   Relationships among keywords from responses to Question 1
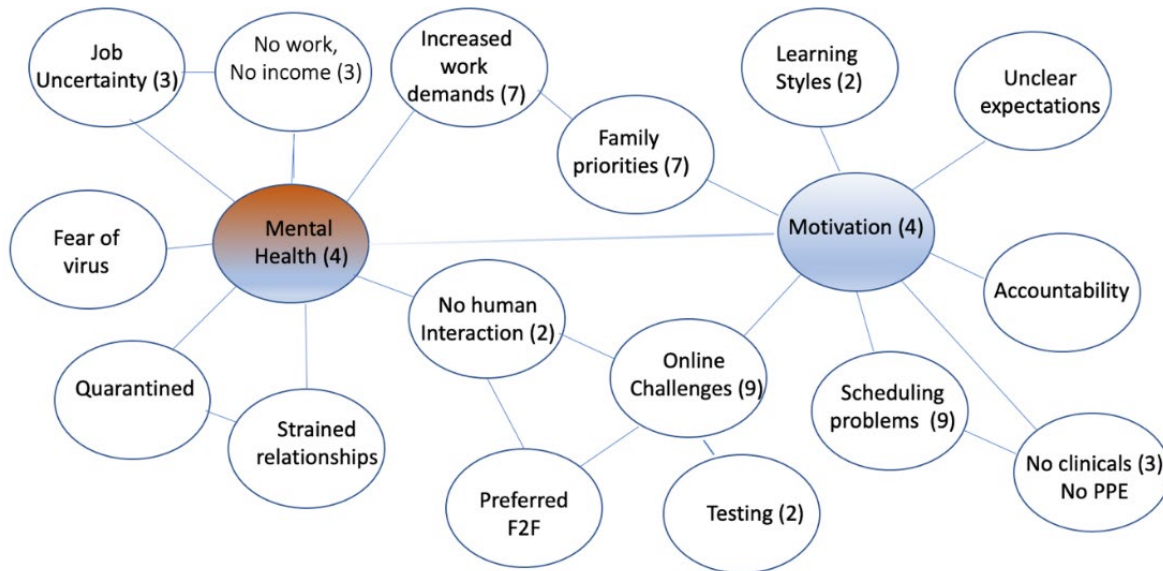
Motivation to do schoolwork was low because of the challenges inherent to OL technology and pedagogy. Testing was difficult. Some students' learning styles did not lend themselves to "book" learning. Some students felt that there were unclear expectations and little accountability. Issues were compounded by scheduling problems and the fact that there were no clinicals and fire department ride-alongs. Students preferred F2F learning. Family priorities took precedence over schooling.

Mental health was impacted because of the problems with schooling, which led to lack of motivation. Other factors were increased work demands or the lack of work and income. Many students were quarantined or ordered to shelter in place, leading to a lessening of human interaction and strained relationships. Uncertainty and fear of the virus also impacted mental health.

Student responses confirmed most of the themes from the literature review while some were not broached or relevant in the context of the study. The limitation to five questions narrowed the topics and responses: In this case study, the paramedic program's quick transition to OL course delivery (see Davis et al., 2020). According to the Institute of Electrical and Electronics Engineers, students appeared to be better prepared than faculty (IEEE Spectrum, 2020), although

in this situation the paramedic program had been using a LMS pre-COVID-19 as part of hybrid delivery and a flipped classroom. Most students had taken OL courses previously.

Faculty communicated effectively (see Jarrell, Dennis, Jackson, & Kenney, 2008) from the beginning of the transition to complete OL delivery. The establishment of communications with students was seamless because the course was hybrid. The program and the college benefited because the college already had an established internet based LMS (see SchWeber, 2008). In fact, over 20% of courses were already OL.

This study confirmed that students prefer F2F instruction over OL delivery (see Tophat, 2020). Students missed the F2F contact with other students and faculty. They missed the feedback and the opportunity to study in informal groups. While OL delivery was successful as a response to the COVID-19 situation, it did have its problems. At least one student did not have the tools and internet services he needed (see Horrigan, 2015). Many students found it difficult to do OL studies because they had to share equipment with other family members, who were also home during the early months of the pandemic (see Davis et al., 2020). As Davis et al. (2020) found, testing proved to be one of the weakest elements of these students' OL learning experience.

CONCLUSION

Different disasters require different responses (Wang & Hutchins, 2010; Shaw, 2017). Because students were required to shelter in their homes, OL studies became the common institutional response to continuing students' studies during the COVID-19 pandemic. This approach continued when colleges opened for Fall 2020 classes. Institutions such as UVU, which had an established OL presence and thus were able to quickly move to OL studies, proved more resilient than schools that were entirely F2F. Students in this study suggested that OL delivery will likely continue. In the Fall semester, 74% of courses at UVU were delivered OL. Even the F2F courses used live streaming over video conferencing software. Students who were the least bit sick were restricted from coming to class, so lectures were live streamed and recorded. These modalities are likely to be one form of organizational change that will outlast the pandemic.

To assure resilience, preparedness is important (Wang & Hutchins, 2010; Shaw, 2017; SchWeber, 2008). One tool of preparedness in this situation that fits other disasters is the capacity to change to OL delivery. Institutions that were already using OL delivery and had an established LMS were able to respond quickly and more effectively to the COVID-19 pandemic.

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