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Remote Learning During COVID-19 on Internal Medicine Residents' Education: Barriers and Enhancements Through Lived Experiences

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REMOTE LEARNING DURING COVID-19 ON INTERNAL MEDICINE RESIDENTS' EDUCATION: BARRIERS AND ENHANCEMENTS THROUGH LIVED EXPERIENCES

by

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ABSTRACT

The COVID-19 pandemic uncovered instructional changes within higher education. Accommodations for continued instruction included a transition to remote learning. However, little research exists regarding the experiences of medical residents during this transition in their education while combating the COVID-19 pandemic. This qualitative study, phenomenological in nature, aimed to explore the lived experiences of internal medicine medical residents at one medical college in Central Florida regarding the transition from face-to-face instruction to remote learning due to the COVID-19 pandemic. Eleven participating medical residents underwent semi-structured interviews via Zoom. Garrison's Community of Inquiry conceptual model and Hall and Hord's Concerns-Based Adoption Model theoretical framework were used. The researcher utilized Colaizzi's phenomenological analysis method to analyze the interview transcripts and Saldaña's coding method to code the data. Dedoose software was used in the analysis process. Participants were found to have shared and non-shared experiences and encountered both benefits and challenges from remote learning. Shared experiences included travel difficulties due to border closures and family challenges. Benefits included the presence of national guest speakers in lectures, attending lectures from the convenience and comfort of home, and the addition of interactive learning methods such as Kahoot and Jeopardy. Challenges experienced during the transition included curricular disorganization, distractions such as watching movies, a lack of interest in attending lectures, and a lack of interaction, with colleagues and by the instructor. Further research recommendations are discussed regarding emergency preparedness in higher education and graduate medical education, in addition to instructor perspectives.

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CHAPTER 1: INTRODUCTION

Background of the Study

Throughout 2020, the entire globe experienced an epidemiological crisis from the Coronavirus, also known as the COVID-19 pandemic. This virus affected society as a whole and everyday life in various ways. People not only underwent quarantines in their houses (Meo et al., 2020), but they also suffered from trauma due to shutdowns, deaths of loved ones, and mass global unemployment.

Natural disasters and healthcare crises are inevitable events that have happened during our lifetimes and will continue to happen. In the past two decades alone, we have experienced both quite frequently. For example, the epidemic severe acute respiratory syndrome (SARS) coronavirus affected the world from 2002 to 2003 and infected 8,000 people; the H1N1 pandemic, or swine flu, killed half a million people globally between 2009-2010; the middle east respiratory syndrome (MERS) coronavirus infected 2,500 people in 2012 (Council on Foreign Relations, 2021). In addition, we experienced an uptick in polio cases in 2014 due to mistrust of vaccination programs. Between 2014-2016, an Ebola virus outbreak spread to eleven countries, causing 11,000 deaths, returning in 2018 to the present day. Finally, the Zika epidemic affected thousands of pregnant women between 2015 and 2016, and the COVID-19 coronavirus killed over 2.5 million people worldwide between 2019 and the present (Council on Foreign Relations, 2021).

Natural disasters have intensified as well. In 2004, a tsunami in the Indian Ocean killed 230,000 people and displaced millions (All That's Interesting, 2019). In 2010, Haiti experienced a 7.0 earthquake that injured or killed half a million citizens. In 2005 the United States experienced Hurricane Katrina, affecting thousands of people (All That's Interesting, 2019).

There was also Hurricane Maria in 2017, a category five hurricane that disheveled Puerto Rico. Disasters such as these affect communities at an economic level and disrupt the pursuit of education and academic degrees.

To that end, a study conducted by Hasan and Bao (2020) found that students have been known to demonstrate negative perceptions of online learning behavior. College students exhibited psychological distress as a result, in addition to fear regarding losing an academic year. Another study concluded that student motivation in virtual modalities is challenging to assess due to the lack of direct contact (Edy et al., 2020). Not everything is known regarding learning through different teaching modalities. However, despite its negative connotations, online learning may prove useful in increasing student competence as a replacement to face-to-face learning during times of emergencies (Joko et cal., 2020). Virtual instruction may be one of the changes in higher education that may become a permanent tool in the emergency preparedness toolbox.

Many changes were also incorporated in healthcare and medical education. In the graduate medical education realm, educators implemented virtual learning platforms to limit the spread of disease (Almarzooq, Lopes, & Kochar, 2020). Modifications were made to typical program activities as graduate medical education programs created action plans to battle COVID-19 (Anton et al., 2020). A cross-sectional study surveys healthcare professionals to assess the impact of the COVID-19 disease. The participants responded they felt overworked, anxious, financially unstable, unsupported, and lacking work-life balance. Since medical residents and clinical fellows are also health professionals, this raises the question: what did graduate medical education look like during COVID, and what will it look like in the post-COVID era?

Utilizing Anderson's multimodal model of online learning (2011), the researcher hoped to better understand the remote learning structure employed by internal medicine medical residents. This model combines major modes of learning online such as the independent study model and the community-of-inquiry, collaborative model (Anderson, 2011). Another model that assisted in the study is the change theory developed by Hall and Hord (2020). This theory incorporates the concerns-based adoption model (CBAM), stressing the concept that change is learning and that the CBAM process can be adapted to the changes experienced in higher education (Hall & Hord, 2020). As the researcher could not anticipate the framework most closely relating to the participant's learning and teaching models, the online learning and change models mentioned above are the most encompassing and may serve well.

Statement of the Problem

A critical effect of the pandemic was the changes implemented in the education systems. Students and teachers experienced benefits and challenges as a result. A significant alteration across all academic grades was the change in modality, from face-to-face to virtual or e-learning (Khalil et al., 2020). It is not fully known how students could learn through different teaching modalities. Studies have been conducted regarding the effectiveness of mobile learning implemented to increase student competence yet at the same time prevent the impact and spread of COVID-19 (Joko et al., 2020). However, the experiences of internal medicine medical residents have not been discussed. Therefore, the need for further investigation into understanding medical trainee experiences arises.

The COVID-19 pandemic is so recent that the long-term impact on graduate medical education remains to be seen (Adesoye et al., 2020). Many distinct aspects of the effects of the

pandemic are left to be studied. Due to the sudden and recent nature of the Coronavirus, little to no research has been conducted, and the literature found is dated less than a year ago. Furthermore, the experiences of internal medicine medical residents in continuing graduate medical education through virtual and remote means have not been examined.

Purpose of the Study

The purpose of this phenomenological study was to explore the lived experiences of internal medicine medical residents within one college of medicine in Central Florida regarding the change from face-to-face to remote learning due to the COVID-19 pandemic. The study offers insight into the learning benefits experienced as a result of remote learning and determined the issues or challenges caused as a result of this shift in learning modality. Additionally, the researcher focused on the teaching strategies utilized during this time and what recommendations could be suggested to the program directors and faculty members for further improvements.

Significance of the Study

Evidently, there is a gap in the research. Although literature exists detailing the impacts of COVID-19 on education, learning, and teaching, the research did not appear to overlap with lived experiences or graduate medical education. Moreover, qualitative studies were not found in the literature regarding internal medicine medical residents or graduate medical education. While some authors focused on learning online in the K-12 system, others discussed alterations in learning and limitations within medical schools and specific medical specialty training programs. Every step on the educational ladder was affected by the repercussions of COVID-19, no matter the capacity.

The significance of this study involves a study conducted by Didwania et al. (2017), where the researchers examined the impact of a video-based interactive workshop on the unprofessional behaviors shown by internal medicine medical residents. Although the research included video, arguably a modality utilized in virtual or remote learning, it did not directly dive into impacts related to the COVID-19 pandemic nor through virtual learning as a whole. A commentary discussed the perspectives of internal medicine chief residents and their experiences during the first half of 2020 at the onset of COVID-19 (Tisdale, Filsoof, & Singhal, 2020). Although the authors shared their lived experiences in phases, they did not explore the benefits and challenges of remote learning from a learner's standpoint. Chief residents are regarded as junior faculty due to their administrative roles in graduate medical education.

Regarding transitioning, the significance of this study is that the literature discussed overviews of the impact the pandemic's changes have caused on medical students and their uncertainty for entering medical residencies, such as internal medicine (Byrne et al., 2020). However, there is a need for research regarding adapting, particularly focusing on the intern year for medical residents and their coping responses to COVID-19 (Chew et al., 2020). Although there are known best teaching practices for remote learning environments, there is a lack of research regarding the best strategies, or the lessons learned within teaching internal medicine medical residents (Giordano, & Christopher, 2020). Furthermore, no research was found studying how internal medicine medical residents and their faculty members coped and adjusted to online learning. Therefore, the researcher intends to conduct research that will contribute to this gap in the literature. This study aims to fill in current gaps regarding the learning experiences of medical residents in the internal medicine specialty during the COVID-19 pandemic.

Definition of Terms

This study provides term definitions to better understand the key vocabulary for readers with no healthcare or medical education knowledge.

COVID-19

A novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a virus with diverse biological and epidemiological characteristics. It is considered to be severely contagious and has threatened the globe. Approximately 3.9 billion individuals were quarantined in their homes due to this pandemic, which emerged from Wuhan, China, and quickly spread worldwide (Meo et al., 2020).

Didactics

For the purposes of this study, didactics are a medical teaching method that is instructive. Lectures, textbooks, and clinical demonstrations via patients and labs can be utilized. Didactics provide medical residents and clinical fellows with the required theoretical knowledge. Traditional didactics in internal medicine comprises noon conferences and has been recently replaced with an Academic Half Day structure (Wagoner & Seltz, 2019).

Flipped Classroom

An instructional method model where self-study and classroom time are reversed. Learners learn the material on their own time to process information before class. The information is then applied during class through methods of interactive learning (Wittich et al., 2018).

Graduate Medical Education

Refers to a point in the education pipeline for students achieving medical licensure. Students undergo undergraduate education, medical school, and graduate medical education to

become a physician. As a graduate medical learner, he or she specializes in a medical specialty, such as internal medicine, through a residency program. The learner can then further specialize through fellowships or subspecialty, such as cardiology, or gain administrative experience through a chief residency year position. Medical residency programs can last between one to seven years, and clinical fellowships can last up to three years. After achieving board licensure in their specialty, physicians must maintain their certifications and continue their medical education throughout the physician's career (Linville & Bates, 2017).

Higher Education

For the purposes of this study, higher education refers to education or schooling obtained after the successful completion of high school or a GED (general education development test). This includes undergraduate, graduate, medical undergraduate, and medical graduate education, where a learner accomplishes a degree.

Internal Medicine

A medical specialty that deals with the diagnosis, prevention, and treatment of internal diseases affecting adults. They apply clinical expertise and scientific knowledge to the compassionate care of adults. This residency program is three years in length and produces physicians by the name of internists. If an internal medicine physician practices in a hospital setting, they may also be referred to as a hospitalist (American College of Physicians, n.d.).

Medical Resident

A medical resident is not yet board-certified and cannot practice outside of training. Their roles include that of a student and as a health care provider. Medical residents have successfully completed medical school and hold a Doctor of Medicine (MD) degree, Doctor of Osteopathic Medicine (DO) degree, or another medical diploma such as an MBBS (Bachelor of Medicine,

Bachelor of Surgery). Medical residents participate in graduate medical education programs to obtain training in a medical specialty. Residents are supervised by attending physicians (faculty members) or senior residents (Educational Commission for Foreign Medical Graduates, 2018).

Morning Report

An educative instructional modality that allows instructors and learners to interact and discuss patient care. This takes place through a case-based conference, typically held in the morning, where medical residents can gather with faculty members (Dousa et al., 2014). This allows learners to meet and collaborate on clinical issues (West, 2006).

Remote Learning

This term can also be called distance education, distance learning, or e-learning. Learning activities can be conducted via attending online or virtual classes through a virtual meeting platform. Learners can also stay connected to the classroom through e-mail, learning management systems, video chat, videoconferencing, social media, messenger apps, e-mail, or phone calls. Multiple technology mediums are used, such as computers, laptops, tablets, or phones (Carpenter & Dunn, 2020). For the purposes of this study, remote learning will be considered learning via instruction outside of the classroom through virtual means.

Theoretical Frameworks and Conceptual Models

According to Grant and Osanloo (2014), a theoretical framework is the "blueprint" of a dissertation, and without it, the vision of the study remains unclear. This framework assists in determining what the researcher will examine and measure. A theory tends to comprise concepts, themes, constructs, and principles (Kivunja, 2018). Although qualitative research methods do not

pre-determine a theoretical framework due to the nature of the method, one can still be applied (Grant & Osanloo, 2014).

A conceptual framework differs from a theoretical framework in that a conceptual framework speaks to the researcher's plan on how the research issue will be explored. According to Ravitch and Riggan (2017), the conceptual framework a researcher chooses describes and informs the development of data collection, research questions, data analysis, design selection, and findings presentation. Conceptual frameworks make the argument for the importance of the study and propose why the planned means to the study are appropriate (Ravitch & Riggins, 2017).

Theoretical Frameworks

The theoretical framework used in this study is the Concerns Based Adoption Model (CBAM), a model adhering to change theory developed by Hall and Hord (2020). Their theory of change states that change has twelve principles. According to Hall and Hord (2020), change is a process that occurs in three major phases: developing, implementing, and sustaining. The central premise of this model is that change is learning, meaning when the learner makes a change, they will learn as a result.

This model is made of three components: stages of concern (SoC), levels of use (LoU), and innovation components (IC). Thus, the CBAM model, in particular, offers a research-based construct that can be adapted to facilitate, understand, and evaluate factors regarding policy, curriculum development, and student outcomes pertaining to technology in the classroom, such as online learning (Hall, 2010). The researchers also state that an institution of higher education

as a culture can be used as a context for learning; the culture can support implementing change and provide continuous improvement (Hall and Hord, 2020).

One study conducted in China utilized the Concerns Based Adoption Model as a framework to investigate the concern levels teachers had regarding inclusive education (Yan & Deng, 2019). Their results concluded that teachers decided whether or not to incorporate inclusive education based on their personal knowledge of its effectiveness. Focusing on stages of concern and utilizing a stage of concern questionnaire, the researchers were able to assess teachers' attitudes regarding changes in inclusive education at multiple points of its implementation. The study illustrates the benefits of incorporating this framework to evaluate change and attitudes toward change. Because of its adaptability and multitude of model components, the CBAM can provide a structure relating to better understanding graduate medical education, the experiences of medical residents and fellows during the transition to e-learning due to the COVID-19 pandemic, and the overall emergency preparedness in higher education.

Conceptual Models

Within the literature, one study conducted by Whittle et al. (2020) provided a conceptual educational framework to respond to the virtual teaching crises. Their emergency remote teaching environment (ERTE) model was proposed for both the COVID-19 pandemic and future emergency remote teaching scenarios. Their framework's main component focused on the flexibility of shifting variables and constants instead of planned pedagogy (Whittle et al., 2020). However, this design emphasized K-12 teachers rather than higher education. Thus, the conceptual frameworks guiding this study are community of inquiry and transactional distance.

Cognitivism, a dominant learning theory, explains the workings of the brain and cognitive development that form knowledge acquisition as well as learning foundations (Picciano, 2017). Another construct, social constructivism, explains learning as teaching as a social phenomenon between students and teachers that is interactive and complex in nature. These sub theories have contributed to the formation of learning theories for online education.

One such model (Picciano, 2017) is the community of inquiry (CoI) model developed by Randy Garrison, which is based on three presences that collaborate to form the learning experience. These three presences are the cognitive presence, teaching presence, and social presence. Connectivism, a theory based on eight principles that acknowledge shifts in how information and knowledge flow and change due to communication networks (Picciano, 2017). Online collaborative learning (OCL) is an additional theory deriving from social constructivism focused on collaborative learning environments. Learners are encouraged to solve problems together, and the instructor facilitates learning and knowledge building (Picciano, 2017).

The community of inquiry model was especially designed to support higher education (Akti-Aslan & Turgut, 2021). The three presences interconnect to shape the learner's experience through online education. Cognitive presence, the most critical element of the model, adheres to the extent to which the learners in a community of inquiry can sustain communication and create meaning (Garrison et al., 1999). Social presence includes the extent to which communication contributes to a sense of community and identification within the academic setting (Garrison, 2015). The final element of the model is the teaching presence, which incorporates the direction, facilitation, and design of social and cognitive processes to accomplish meaningful learning outcomes (Garrison & Arbaugh, 2007).

Research studies have investigated the effectiveness of the community of inquiry model, finding that cognitive presence has an impact on online learning, while no difference is observed in social presence in comparison to face-to-face learning (Akti-Aslan & Turgut, 2021; Al-Nuami, 2017). Another study looking investigating learner support in distance learning, utilizing the social presence aspect of the model, solely found that the majority of participants were both comfortable and effectively communicating with one another during their online learning experience (Baloyi, 2014). The model can also be utilized as an assessment tool to measure the effectiveness of online courses, such as with the study conducted by Yildirim and Seferoglu (2021), or how to better improve an online course (Kovanovic et al., 2018).

Due to the global transition to remote education as an emergency measure due to the COVID-19 pandemic, it has become necessary to develop a framework specifically for learning and online learning environments (Akti-Aslan & Turgut, 2021). The community of inquiry model, based on the constructivist and collaborative learning perspectives can be utilized to design an effective experience of online learning. This pedagogical model acts as a guide for online learning environments, which have increased due to COVID-19. It is adaptable and can be utilized for design or for effectiveness testing. Utilizing the model, the study can further investigate which aspects were present during the online learning transition in graduate medical education. For this reason, the community of inquiry model is appropriate for this study as it pertains to the educational switch to online learning for medical residents, as well as emergency preparedness in higher education.

Research Question

The study comprised of one main research question:

1. What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19? This question includes:
    a. What shared and non-shared experiences, if any, existed between the residents?
    b. What were the benefits, if any, of remote learning, compared to face-to-face instruction?
    c. What were the observed limitations, if any, of remote learning, compared to face-to-face instruction?

Limitations

Several limitations were identified in this study. Due to the nature of social distancing due to the COVID-19 pandemic, qualitative interviews were conducted virtually. Face-to-face interviews in natural settings were recommended, which allowed for the participant to be observed directly and to provide information while in their natural setting. A secondary limitation experienced was the possibility of the use of participants already known to the research. This allowed participants to become vulnerable in their responses due to the established rapport, but potential work conflicts-of-interest influenced some participant involvement to respond broadly to research and interview questions. However, this limitation may hinder future researchers, as their high participation rate may not be duplicated. Another limitation was the sample of participants that were drawn from a single academic institution and from one medical specialty. The results are not generalizable nationwide or to graduate medical education as a whole.

A final limitation is medical resident schedules. Medical residents are exceedingly busy, making their participation itself a limitation. According to the American Medical Association (2019), an intern, or a first-year medical resident, spends 13% of their day on direct patient care, 21% on rounds, and 7% on educational activities. Medical residents commonly work 60-80 hours per week (Linville & Bates, 2017). However, most follow a general pattern in schedules. Internal medicine residents on standard inpatient rotations wake up at approximately 5:30 am to begin their shifts at 7 am (Sindhu, 2020). Between sign-out, pre-rounds, rounds, work time (such as test result reviews, discharges, charting, patient care), and noon conference, internal medicine medical residents complete their workday after 5 pm (Sindhu, 2020). Finding time out of their schedules to accommodate participation in this study proved to be a bit challenging.

Delimitations

The delimitations that were utilized by the researcher in this study were determined by a desire to maintain anonymity within the sample as well as to gain an understanding of the experiences in certain graduate medical education programs. The researcher only sampled participants from one specialty offered at three different hospital sites within the same academic institution. The researcher also only utilized participants from one academic institution, which did not allow for the researcher to gain the perspective of individuals at other institutions across the state or nationwide.

Assumptions

The study included assumptions: (a) the participants selected responded truthfully to the interview questions, (b) the selected participants understood the interview questions, (c) the

sample of selected participants is typical of the total population of medical residents at their location and specialty. While overcoming all assumptions may not be possible, the researcher attempted to do so. For example, when the participants did not understand the interview questions, the nature of semi-structured interviews allowed the researcher to explain the questions thoroughly.

Organization of the Study

This research study is organized and presented in five chapters. Chapter I includes the background of the study, the statement of the problem, the purpose of the study, the significance of the study, the definitions of key terms, the theoretical framework, and the research questions (Lunenburg & Irby, 2008). It provides the limitations, the delimitations, the assumptions of the study, and the organization. Chapter II presents a review of the literature, which includes COVID-19, graduate medical education, the impact of the pandemic of healthcare and education, benefits of remote learning, hindrances of remote learning, teaching strategies, and lessons learned.

Chapter III describes the research study's methodology. It includes the selection of participants, the protocol, the data collection, and the data analysis procedures. Chapter IV discusses the findings of the research study. This includes demographic information, testing the research questions, theme analysis, and the results of the data analyses for the research questions (Azodi, 2006). Chapter V provides a summary of the study in its entirety, a discussion of the findings, the implications of the findings for theory and practice, the recommendations for further research, and the conclusions of the study.

CHAPTER 2: LITERATURE REVIEW

In the past year, the planet has undergone societal trauma in the form of the COVID-19 pandemic. This epidemiological crisis has affected life as it was once known in various ways. One of those ways has been in education. There have been both detrimental and beneficial changes within education. The world has also had to grieve the “old normal” and welcome or accept the “new normal.” What Francisco and Nuqui (2020) coined *new normal* was first referred to after World War II, where the world returned to as "normal" as it could get. One change has been how students learned through different teaching modalities. Many institutions transitioned into virtual modalities or e-learning. The researcher is interested in knowing what impact these changes have left on internal medicine residency training programs and what this will look like after COVID-19 is eradicated.

Emergency Preparedness in Higher Education

Around the World

Emergency preparedness was managed differently in the international sector by different countries. These emergencies range from healthcare crises to natural disasters and even political situations. Haiti suffered a 7.0 magnitude earthquake in 2010 (Morse et al., 2021). The researchers supported a teaching hospital that instilled investments in a transformed and sustained model of graduate medical education. The result was preparedness in responding to acute disasters (Morse et al., 2021).

South Africa experienced campus closures due to political unrest and student protests regarding student exclusion in 2015-2017 (Czerneiwicz et al., 2019). Universities shifted to online education delivery to complete the curriculum during the campus disruptions. As a result,

a study by Swartz et al. (2018) proposed utilizing Tronto's Ethics of Care lens regarding open educational practices in times of disruption.

Earthquakes are a common natural disaster worldwide, and two earthquakes in 2010 and 2011 affected New Zealand. Researcher Ayebi-Arthur (2017) proposed a case study regarding the increase of e-learning resiliency during the recovery of the 2011 earthquake. The studied college of law provided audio and video recordings of lectures to students to continue education (Ayebi-Arthur, 2017).

Another institution, the University of Canterbury, learned through emergency preparedness due to these two earthquakes that service-learning can provide educational opportunities outside of the classroom when crises arise (O'Steen & Perry, 2012). Through this learning method, student experiences are valued and credited; Socratic dialogue was also added. Finally, a responsive and engaging curriculum was designed to allow students to critically reflect on the experiences resulting from a crisis (O'Steen & Perry, 2012).

One study by Richardson et al. (2015) investigated factors that could be addressed in pre-disaster curriculum design and course planning following the New Zealand earthquakes. From an instructor's standpoint, assisting student learning following a crisis is vital. This assistance can be accomplished through flexibility in their educational delivery and maintaining clear communication. In addition, recognition of the disruption and impact of the crisis allows students to cope and provides personal support. Support was also critical, as the student participants cited their social and physical environment as two external factors influencing their studies (Richardson et al., 2015). This study illustrates the Community of Inquiry Model, as the learners' cognitive presence depended on both social and teaching presences.

Literature reviews have synthesized findings regarding COVID impacts and emergency preparedness. One researcher from the Azteca University of Mexico provided suggestions and recommendations for further preparation after this pandemic. Because online has proven the best available instruction option, all educational resources should be automated (Kayyali, 2020). Higher education institutions should also focus on behavioral psychology to clarify and facilitate the teaching modality transition. A Higher Education Emergency Response Network (HEERN) should be established to provide recommendations and advice and assist decision-making during crises. Finally, quality assurance agencies should prepare plans regarding university accreditation through extensions or suspensions, while international quality agencies should provide emergency management packages (Kayyali, 2020).

Another researcher studied emergency remote teaching during COVID-19 across 17 nations. While no future emergency preparedness plans are discussed, suggestions due to the shift are. When shifting to emergency remote teaching, two vital components that should be present, according to Stewart (2021), should be teaching presence and social presence. There should also be institutional support, equivalent learning experiences, and the alignment of digital tools with curricular objectives (Stewart, 2021).

A framework was developed for higher education during disaster and emergency management situations years before the COVID pandemic in Australia. Called Generic Emergency and Disaster Management Standards (GEDMS), this framework focused on core expertise to merge knowledge and skills (Fitzgerald et al., 2017). The critical domains of this framework are professional practice and critical thinking, which include the themes of leadership, collaboration, and communication as skills (Fitzgerald et al., 2017). However, no information on how this framework was implemented during COVID was found.

Mexico experiences frequent geological and hydrometeorological events due to its geographic location (Villasana et al., 2016). One approach for disaster risk management (DRM) in Mexico was to raise awareness of risk management and foster a culture around it. The researchers proposed the creation of an introductory elective course regarding disaster risk management to university students and more specialized courses (Villasana et al., 2016). The classes would provide additional focus on resilience and vulnerability. Specialty courses would educate the public on risk reduction, development planning, and post-disaster recovery. These specialties may be helpful in recovering post-pandemic.

A study by Perdikou et al. (2016) similarly studied the presence of education in disaster relief among European higher educational institutions. The researchers concluded that education disaster resilience should be offered in the form of concentrated majors. However, natural disaster education is a new area of academic study. On a global scale, higher education institutions can benefit from finding appropriate solutions to the issues caused by the pandemic, especially in the education sector (Karakose, 2021).

In the US

Emergency preparedness speaks to how prepared we were in higher education to combat the effects of COVID-19, how we handled the pandemic, and what changes were made as a result. In the United States, crisis management was heightened after the September 11, 2001, terrorist attacks, prompting higher education institutions to employ emergency preparedness coordinators and develop disaster plans (Lipka, 2005). After Hurricane Katrina, higher education institutions learned that they must also plan for possible prolonged campus shutdowns and must work collectively together to assist the sector stay afloat. This teamwork consists of creating

predetermined mutual aid agreements with other institutions in the event of displaced students or a displacement of resources (Lipka, 2005).

The general consensus appears to be headed in the same direction as Europe regarding providing education to the public. For example, the medical school at Pennsylvania State University was the first and only institution to offer a degree program in public health preparedness as of 2007. The master of homeland security (MHS) could assist in providing innovation in emergency preparedness within higher education (Cherry & Davis, 2007).

Graduate students at Emory University in Atlanta have trained to respond to complex humanitarian emergencies (CHEs) (Evans et al., 2016). The Center for Humanitarian Emergencies at Emory provides an educational program model targeting learners from undergraduate to graduate levels to ensure education is provided in public health. The ultimate goal is to address the shortage of public health professions that coordinate humanitarian responses for future crises (Evans et al., 2016). It appears that integrating emergency preparedness into curriculum and courses can aid preparedness in the sector of higher education overall.

Hurricane Harvey affected Houston, Texas, in 2017. Although students attending face-to-face classes were not affected, online students who physically resided in Houston were impacted. A research study conducted by Holzweiss et al. (2020) used the Zdziarski theoretical framework of crisis management for college campuses that consisted of planning, response, prevention, mitigation, learning, and recovery, to examine crisis management within online education. The study raised awareness of the need to consider online students essential to the campus community. Therefore, their institutions must study their online students' demographics, needs, and geographical locations to create a crisis team for this group (Holzweiss et al., 2020). Crisis

command centers should also be designated for all online students' communities. Emergency preparedness in the higher education sector should be inclusive to all student-types.

Hurricane Katrina caused significant damage to Louisiana and displaced many Americans. Because of this disaster, Baylor College of Medicine developed a disaster management plan to help institutions with emergency preparedness (Searle, 2007). Baylor enrolled over 600 displaced medical students from New Orleans's Tulane University. The displacement led to finding lodging for students, providing counseling, and obtaining records (Searle, 2007). The research illustrates the importance of collaboration, cooperation, compassion, curriculum, and compassion as integral parts of disaster preparedness and management (Searle, 2007).

In contrast, Hurricanes Rita and Ike directly impacted Lamar University. The natural disaster challenged the institution to consider disaster recovery planning. Institutional planning involved prioritizing the recovery effort established after Hurricane Rita and implemented during Hurricane Ike. Other considerations include addressing communication and financial concerns and planning alternative academic calendars (Beggan, 2011). Additional recommendations would be to identify and train emergency response recovery team members, identify a control facility and chain of command, network with disaster recovery experts, and improve communication (Beggan, 2011).

The University of Texas Medical Branch (UTMB) was affected by Hurricane Ike, and their emergency preparedness approach afterward became student-oriented. The institution established a mutual aid agreement with other University of Texas campuses (Watson et al., 2011). It also created a student personal emergency response plan in preparation for a natural disaster. The student plan advises students which supplies should be taken, to have cash on hand,

to learn the evacuation route, to back up their electronic data, develop an emergency communication plan, obtain rental insurance, and prepare their dwelling for impact (Watson et al., 2011). This approach to emergency preparedness focuses on not only education but also the well-being of the learners.

Perhaps the most effective display of higher education collaboration is the "Sloan semester," where 135 institutions from 36 states enrolled their students in 800 online courses funded by Sloan (Lorenzo, 2008). The Sloan semester was an initiative sponsored by the Sloan Consortium to respond to the Hurricane Katrina and Hurricane Rita disasters. It allowed students to continue receiving their education via online modalities as their institutions were shut down during Fall 2005 (Lorenzo, 2008). Even when online transition seems to be the most effective option, institutions may need outside help and communication to join together with this resource.

One final suggestion for emergency preparedness is implementing a surveillance system during health crises at educational institutions. During the pH1N1 pandemic in 2009, two universities in Washington DC implemented surveillance systems to acquire data on the presence of the virus on campus (Zhang, 2011). Putting a data-tracking system in place could allow institutions to more accurately decide when to shut down campus due to safety concerns.

In Graduate Medical Education

Graduate medical education has put in place disaster management plans to prepare for closures or disasters at training sites (Al Bualy et al., 2020). However, if all training sites face prolonged disaster, Al Bualy et al. (2020) suggest implementing business continuity planning that can be summarized into resilience, resolve, reimagination, return, and reform. Business

continuity planning will allow graduate medical education to prepare for the next normal and continue making changes in their current learning and assessment methods.

Hurricane Katrina exposed the gaps in the Accreditation Council for Graduate Medical Education (ACGME) emergency preparedness system. Therefore, a new disaster recovery plan was created, including more rapid responses to future disaster and healthcare crises. As a result, the new plan effectively relocated 600 medical residents during Hurricane Ike in 2008 (Donini-Lenhoff et al., 2010). Part of the challenges to improve upon included communications, meaning it is vital to have more than one communication modality or multiple communications providers in graduate medical education (Conlay et al., 2007).

At the same time, Hurricane Harvey caused changes in the GME disaster plan at Corpus Christi Medical Center. The healthcare system realized emergency preparedness includes evaluating the minimum number of staff and medical residents needed to maintain quality and safety and ensure an optimal team structure (Newman & Gallion, 2019). The GME department also now prioritizes thorough planning, such as taking inventory of essential supplies and defining the duties and expectations of each medical resident during crises (Newman & Gallion, 2019).

Emergency preparedness in graduate medical education also means educating and preparing the medical residents for crises, not just the program curriculum. One study conducted by Franc and Nichols (2012) developed a course curriculum in disaster medicine for emergency medicine training. The researchers found that at the end of the training, the medical residents felt more confident in their knowledge and preparation should a disaster arise (Franc & Nichols, 2012).

Multiple hurdles face graduate medical education during a healthcare crisis. These challenges include fear of contracting the disease, lack of medical resident experience or maturity, or scheduling conflicts within residency requirements, as was the case with infectious disease residents deploying to Liberia during the West African Ebola outbreak (Mo et al., 2016). Acquiring disease is perhaps the most crucial fear, as medical residents are not only learners but also first responders during disasters. Ironically, one study found medical residents perceived the risk of acquiring the H1N1 influenza of 2009 but did not comply with the recommended infection control precautions (May et al., 2010).

Academic medicine institutions are increasingly at risk of major natural disasters and healthcare crises (Whitcomb, 2007). It seems that Graduate Medical Education was ahead of higher education in emergency preparedness. However, this is because graduate medical education's accrediting body covered precautions and disaster plans. Nevertheless, improvements are progressively made to the disaster preparedness plans with each passing natural disaster and healthcare crisis. The COVID-19 pandemic has forced graduate medical education administrators to examine and review the current medical curriculum, assessing the evidence of effectiveness in blended approaches to education as a means of better preparedness (Torda et al., 2020).

Learner Experience during Crisis

Crises are inevitable, but how learners react and experience crises could vary. Uncertainty sets in, and students face a future of unknowns. That was the case with learners preparing for higher education as displaced students after Hurricane Maria in Puerto Rico. Not only did the learners experience the trauma of the hurricane, the adjustment of moving from Puerto Rico, and

the stress of replanning their college careers (Rodriguez et al., 2020). Displacements due to natural disasters can interrupt student trajectories and lead to dropout.

Students tended to withdraw initially during the global shutdown due to the COVID-19 pandemic (DeMartino, 2021). There was also the experience of attempting to make sense of reality. The directive to transition to remote learning and not return to campus after spring break caused confusion, anxiety, and a flood of emotions (DeMartino, 2021). For most, a global shutdown where society ceased to operate had never been experienced before. One report suggested COVID-related impacts on increased alcohol, substance use, and suicide may persist until 2029 (Bedrossian, 2021). According to the Centers for Disease Control and Prevention, 25% of young adults aged 18-24 reported contemplating suicide, the second leading cause of death in American college students (Bedrossian, 2021).

Learner mental health also suffers during experiences of crises. Social isolation from the shutdown has been documented in prior natural disasters to lead to anxiety, depression, domestic violence, substance use disorders, and child abuse (Almeida et al., 2021). The quarantine can be viewed as a traumatic experience, placing learners at risk for post-traumatic stress disorder (PTSD). Learners from all age ranges were affected by school closures due to a decrease in social and physical activities, often resulting in irregular sleep patterns, less balanced diets, increased screen time, and decreased exercise (Almeida et al., 2021). Loneliness was also found to accompany moderate and severe feelings of anxiety (Vivechana & Bimala, 2021).

Medical residents are also affected psychologically during crises. In fact, two nurses committed suicide who had tested positive for COVID-19. Psychological effects such as anxiety, frustration, anger, insomnia, fear of illness, and depression, along with the impact of social isolation, can persist after the initial danger of the pandemic (Jun et al., 2020). Residents, along

with the community, also experienced feelings of despair, hopelessness, bereavement, and grief (Usher, 2020). Psychologically in society, hoarding behavior, panic buying, and the 'urge to splurge' due to one's felt mortality were also experienced (Usher, 2020).

Post-traumatic stress disorders were found to be at an all-time high during and after the outbreak of severe acute respiratory syndrome (SARS) in 2003 among direct care providers (Jun et al., 2020). During the Ebola outbreak, one in four healthcare workers experienced symptoms of depression, paranoid ideation, interpersonal sensitivity, and obsessive-compulsive tendencies (Jun et al., 2020). A study in China found essential workers caregiving to those positive with COVID-19 were at risk for developing anxiety and depression as they dealt with feeling vulnerable, coping with deaths of patients, family, and colleagues, losing control, fear of health and safety, and working increased hours (Jun et al., 2020). Learners in graduate medical education are sure to suffer from the mental health impacts of disasters and healthcare crises from the lens of a learner and a healthcare provider.

Graduate Medical Education

Graduate medical education (GME) is an essential link in the physician education chain. This department was originally an apprenticeship model with an accreditation system focused on compliance with process standards. It is now a structured educational system that provides outcomes-focused healthcare through its peer-review organization (Linville & Bates, 2017). Graduate medical education is part of the pipeline of the education timeline for physicians. This timeline includes college, medical school, graduate medical education in the form of medical residency, and an option clinical fellowship, followed by certification maintenance and continuing medical education. Thus, graduate medical education influences the quality of

education, the costs of healthcare, and the available healthcare workforce (Linville & Bates, 2017).

Its evolution was driven by the accreditation council for graduate medical education (ACGME), which began in 1981. Since then, variability in education led to a structured accreditation approach, include the Outcome Project initiative starting in 1998 (Linville & Bates, 2017). The goal of this initiative was to utilize competency and outcome data to demonstrate that graduate medical education programs had the ability to adequately prepare their residents to work in healthcare (Linville & Bates, 2017). These core competencies were created by ACGME in conjunction with the American Board of Medical Specialties and include medical knowledge, patient care, interpersonal and communication skills, systems-based practice, practice-based learning and improvement, and professionalism (Linville & Bates, 2017).

Beyond competencies, ACGME also implemented accreditation changes across the board, such as duty limits in 2002 (Linville & Bates, 2017). This change was brought about to improve the resident training environment and to limit increased demands on trainees before government entities would begin to mandate changes. The duty hour limitations included a working week of 80 maximum hours (Linville & Bates, 2017). Time off between shifts and restricted to the number of overnight call shifts were also required. In 2011, hours were further limited to include a maximum of 16-hour shifts for trainees in their first year (Linville & Bates, 2017). Limited duty hours provide optimal education conditions. Physicians of the millennial generation have been shown to work 13% less than previous generations as a result (Linville & Bates, 2017).

Through the Outcome Project, the ACGME introduced its Next Accreditation System (NAS) in 2013. The construct was designed to enhance the peer-review system in medical

education that would be based on educational outcomes. This allowed graduate medical education programs to be accredited based on their demonstrated compliance and by how well their trainee residents met educational outcomes (Linville & Bates, 2017). The NAS adopted educational milestones, which served as a roadmap for the six core competencies. As a result, each medical specialty has a framework of milestones reflective of the competencies, the goal being to assess the progress and success of their trainees (Linville & Bates, 2017). Individual programs undergo a consistent annual review in a 10-year cycle, to include a self-study process and a site visit. As of 2015, another component of NAS is the clinical learning environment review (CLER), a non-accreditation review that each sponsoring institution must complete every 18-month CLER cycle (Riley & Riley, 2016). This includes a short notice review visit to provide institutions with feedback about their clinical learning environment in 6 domains: healthcare quality, care transitions, patient safety, supervision, mitigation and professionalism, and duty hours and fatigue management (Linville & Bates, 2017).

Additionally, as of June 2020, all osteopathic GME accredited institutions by the American Osteopathic Association (AOA) shifted to ACGME (Linville & Bates, 2017). There have been increases in student enrollment in both allopathic and osteopathic medical schools, with a need to meet physician shortages. However, there is not adequate federal funding for GME expansion (Linville & Bates, 2017). This does not negate the fact that the current growth rate of graduate medical education positions will not meet the demand. Graduate medical education will have to incentivize programs and trainees to provide coverage to underserved geographic locations and populations. Unfortunately, not enough trainees are entering primary care to meet these needs, as other specialties and subspecialties are more attractive (Linville & Bates, 2017).

Graduate medical education currently obtains $15 billion annual funding from state and federal entities, representing 0.55% of the annual health care expenditure (He, Whang, & Kristo, 2021). The American Centers for Medicare and Medicaid (CMS) pays over $10 billion for graduate medical funding nationwide each year (Riley & Riley, 2016). Before WWII, medical residencies were regarded as apprenticeships where the resident received room and board and a small monthly stipend (He, Whang, & Kristo, 2021). Because of the GI bill, governmental subsidies for teaching hospitals began. In 1965 the Social Security Amendments created the Medicare program, which provided support to new physicians through education funding (He, Whang, & Kristo, 2021). Reimbursement was determined through the hospital's historical costs and included coverage for faculty salaries, resident stipends, and other educational expenses.

As of 1997, due to the Balanced Budget Act, funding change and hospitals are capped on a maximum number of residents eligible for Medicare GME reimbursement (He, Whang, & Kristo, 2021). Graduate medical education funding streams include the HRSA, the Department of Defense, the Department of Veterans Affairs, and private healthcare insurers. The Department of Defense supports graduate medical education programs through the Air Force, Army, and Navy, supported 1816 medical residents in 2015 alone. President Trump's department of health and human services fiscal year 2021 budget proposal prioritized graduate medical education funding reform (He, Whang, & Kristo, 2021). However, no changes have been made.

Graduate medical education is taught through the clinical learning environment in addition to lecture, such as didactics, although training is primarily physically hospital-based. However, efforts are being made to divert federal funding from hospitals to non-hospital training sites. In addition, another option could be sponsoring institutions that could provide flexibility in addressing the shortages and imbalances (Linville & Bates, 2017). Graduate medical education

continues to evolve to better serve the needs of its trainees and the community by producing quality physicians.

Internal Medicine

Internal medicine is a clinical specialty focusing on internal adult diseases. There are over five hundred internal medicine residency programs across the United States, training 27,000 medical resident trainees (Heppe et al., 2020). Internal medicine residency programs comprise of intense training that can at times lead to resident burnout. However, regular physical activity plays a significant role in managing mental health disorders. It was found among 76 internal medicine residencies in a study conducted by Olson et al. (2014) that physical activity is also inversely related to burnout.

Didactics & Morning Report

Education looks differently in GME as the learners are medical residents and clinical fellows. One instructional modality is morning report, a case-based conference allowing learnings and instructors to interact and discuss patient care (Dousa et al., 2014). It is a central educational activity within resident and fellow education (Heppe et al., 2020).

Morning report is beneficial to learning but can also be improved. A needs assessment conducted in Qatar via a questionnaire resulted in the enhancement of morning report by allowing it to be resident-driven, resident-led, leading to resident-focused learning. This was achieved by improving the organization of morning report, adding variety to the content shared, and introducing more critical topics such as patient safety and quality improvement (Dousa et al., 2014). Residents also suggested additional interventions to include inviting specialists of different subspecialties to speak, and for case management to be address with more details.

A study conducted by Heppe et al. (2020) examined morning report across ten VA academic centers, observing a total of 225 morning reports. They found morning report consists primarily of chief residents presenting on single case studies through the means of digital slide presentations. Half of the cases regard life-threatening or rare cases. Common topics during morning reports include quality & safety, social determinants of health, medication side effects, high-value care, and evidence-based medicine. However, medical ethics was absent as a topic. Additionally, the chief residents emphasized history during clinical case studies, differential diagnosis, and didactics (Heppe et al., 2020).

Overall, morning reports are an efficient technique in medical education, although format improvements continue to be studied and revised. A study assessed the developmental process following Iranian standards in an internal medicine residency program at an Iranian hospital. The researchers found that after six weeks of workshops that training and feedback improved the quality of morning report (Mousavi et al., 2015). A morning report format transition was evaluated by West et al. (2010) because direct comparisons to morning report formats are rare. The researchers compared single-level morning reports to a new highly interactive multiple-learner level format. The interactive morning reports were found to have more education benefits to active learning and collaborative case studies (West et al., 2010).

A positive curriculum change that could be implemented in didactics or academic half days (AHD) could be incorporating wellness workshops. Academic half-day, or didactics, are lectures that medical residents regularly attend in their programs. The content of these lectures is part of the programs and their overall training. A research study conducted among 592 obstetrics and gynecology (OB/GYN) medical residents found that residents with a high attendance of

workshops experienced less burnout (Winkel et al., 2020). Attending workshops also improved professional fulfillment.

Some research explored what learning can be achieved beyond academic half-day. For example, Downar et al. (2017) proposed the utilization of standardized patients as a mode of learning aside from didactics alone. One internal medicine residency program developed the Leadership and Discovery Program (LEAD) to promote scholarly activity beyond normal residency training experiences (Carter et al., 2019).

Other research recommended topics for academic half-day but did not mention the format of these lectures. One study conducted by Hargraves et al. demonstrated the lack of knowledge medical residents had on naloxone, a medication used to treat opioid use (2019). They suggested including experiential sessions in addition to didactics to improve their knowledge base. In addition, Busari and Arnold (2009) found a need to train medical residents on didactic skills themselves in order to be competent teachers during their senior year of training.

Another study explored the feelings and attitudes of attending physicians' struggles while residents are gone attending academic half-day (Wagoner & Setlz, 2019). While they mentioned traditional forms of didactic education and proposed changes to a different education model, they did not explain what the current forms of didactics look like.

Prior to COVID-19, teaching strategies and priorities differed from today's graduate medical education approaches. According to Duke University researchers Atwater et al. (2016), the utilization of electronic health record (EHR) templates and teaching effective strategies for chart reviews were prioritized. According to Didwania et al. (2017), video-based workshops were found to be effective for teaching strategies on ethics and unprofessional behavior and their importance to internal medicine medical residents.

COVID-19, Healthcare, & Education

COVID-19

The pandemic commonly known as COVID-19 was originally named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) (Temsah et al., 2020). It is a contagious disease where common symptoms include dry cough, fever, and fatigue (Joko et al., 2020). Infected patients may experience mild and gradual symptoms of nasal congestion, pains, aches, sore throat, runny nose, or diarrhea. The virus was initially identified in late December 2019 in the Wuhan province of China (Temsah et al., 2020). It then spread to over 200 countries (Hasan & Bao, 2020).

The virus can spread by individuals touching a contaminated surface or object and then touching areas in their face to include the nose, eyes, or mouth (Joko et al., 2020). Infection can also occur through inhaling cough drops from an already-infected individual physically near, within 1 meter in the distance. Prevention methods include regular hand washing with soap or alcohol, maintaining social distance from others, and avoiding crowded places. Not touching one's eyes, mouth, or nose and ensuring individuals around follow adequate respiratory hygiene are other ways of preventing the spread of COVID-19 (Joko et al., 2020). Additionally, one should stay at home and isolate or quarantine if they left the house without wearing a mask, one should seek medical assistance if one experiences difficulty breathing, cough, or fever, and should follow the World Health Organization for reliable information and guidelines (Joko et al., 2020).

The COVID-19 pandemic impacted the world in more ways than one. It also had an impact on adult mental health. Outbreaks lead to widespread psychological distress that could have long-term effects, including posttraumatic stress syndrome (PTSD), depression, anxiety, or

worsening pre-existing psychological conditions (Haider, Tiwana, & Tahir, 2020). Mental health management has therefore become a need due to the increased stress, workload, and uncertainty for healthcare workers (Haider, Tiwana, & Tahir, 2020).

Impacts in Healthcare

The pandemic had a profound effect on the medical field. Medical workers were concerned regarding the ability to secure proper personal protective equipment (PPE) (Urooj et al., 2020). The perception of doctors during COVID included the fears surrounding the possibility of infecting family members, missing a COVID diagnosis, becoming a carrier of the disease, the rapid spread of the disease, and the complications of the disease (Urooj et al., 2020). Staying up to date in the information regarding COVID1-9 was critical. In healthcare, group chat applications such as WhatsApp and social media such as Twitter are utilized as outlets to globally disseminate and share knowledge, as well as to collaborate (Almarzoo, Lopes, & Kochar, 2020). Patient care continued to be provided via means of telehealth (Kohan et al., 2020). Fortunately, by 2012 half of the hospital systems nationwide had active telemedicine programs to be utilized in both inpatient and outpatient settings (Kohan et al., 2020).

Graduate medical education programs faced challenges brought on by COVID-19. These challenges included heavy workloads due to a high infection rate in the population, short staffing due to quarantine protocols and residents being ill, and a disruption in normal program training schedules and activities (Anton et al., 2020). To comply with resident and patient safety, normal program activities required modifications in order to comply with social distancing guidelines and public health recommendations. For example, patient handoffs, social events, meetings, and educational conferences were devised electronically (Anton et al., 2020). Close resident contact

was eliminated. Conversations with patients occurred using communication equipment. High touch surfaced areas in shared workspaces were disinfected regularly. Trainees were likely asked to provide care in areas they are not traditionally assigned. Additionally, trainees were asked to shift to higher acuity settings during pandemic emergencies, such as hospital wards or intensive care units (Anton et al., 2020).

Within resident education, depending on specialty, experienced varying degrees of a hindrance. In some programs, resident exposure to critical procedures, experience necessary to progress in their training was limited or eliminated (Anton et al., 2020). According to White et al. (2020), 100% of general surgery programs nationwide reduced the number of medical residents on rounds, and 95.2% reduced the size of their resident workforce in-hospital as surveyed by 84 general surgery residency programs across the country. Daytime staffing decreased by approximately 50% (White et al., 2020). Around 90.5% incorporated telehealth clinics, while 26.2% implemented remote inpatient consults. Resident didactics and clinical care were held virtually 86.9% of the time (White et al., 2020).

A study of 167 neurosurgery residents found that they experienced fewer work hours (Khalafallah et al., 2020). These residents also were experiencing concern regarding how the pandemic would impair their ability to achieve surgical milestones in a timely manner. They also expressed feeling burnout due to alterations in their elective rotations during training (Khalafallah et al., 2020). Healthcare workers during the COVID-19 pandemic had increased responsibilities due to quarantine centers, isolation wards, testing labs, and screening areas (Sethi et al., 2020).

Mental health also braced an impact during the pandemic. Overall, the sense of community within training programs was threatened due to the changes and distancing (Anton et

al., 2020). Families were not allowed to be with loved ones, which left COVID-19 patients alone and scared (Mahmoud, 2020). This was described by Mahmoud (2020) as a medical and psychological war against the novel virus. The medical residents had double the workload as a result. These conclusions were confirmed by Meo et al. (2020), whose study showed that COVID-19 caused emotional detachment, a decrease in overall work performance, and a decrease in time spent studying by medical students. The authors speculated the quarantine due to COVID-19 may worsen learning behaviors in medical students. The COVID-19 pandemic disrupted education and training in a gastroenterology (GI) fellowship. The fellows experienced burnout, which Ong (2020) pointed out led to negative consequences to both the safety of the learners and to patient care.

A study conducted by Payne et al. (2020) surveyed 90 surgery residents in a London hospital through a questionnaire regarding going back to training in intensive care during COVID-19. The researchers found that although the residents felt more confident performing clinical skills, such as managing ventilated patients, the redeployment had a negative impact on the mental health of 53% of the participants (Payne et al., 2020). During the pandemic, medical residents were not only experiencing anxiety but were also financially unstable and overworked while simultaneously expected to care for their families and patients (Sethi et al., 2020).

Anxiety and fear increased in trainees such as clinical fellows for a multitude of reasons during the pandemic. Prevention guidelines frequently changed; there was uncertainty regarding disease risk or not having personal protective equipment readily available, the concern over the health of family loves ones, the notion of social distancing, and the fear of personal vulnerability (Kohan et al., 2020). Trainees and healthcare workers with children faced the burden of school closures and the need for daycares and virtual schooling (Kohan et al., 2020). Working from

home was also a challenge between conducting research and clinical activities in addition to parental responsibilities. Depressive symptoms arose from isolation, disruption in their daily routines, loss of control, and impaired sleeping patterns (Kohan et al., 2020). Other mental health symptoms included irritability, anger, and a sense of grief and loss due to one's loss of control, financial loss, and loss of the old "normal."

High psychological comorbidity as a result of the COVID-19 pandemic was found among healthcare workers in Singapore. Residents in training form a significant portion of the healthcare staff. In this study, 274 participants were surveyed across 27 medical residency specialties (Chew et al., 2020). Within senior residents, exposure to high-risk areas affected their psychological and coping responses. The researchers found some practical applications generalizable across residency training programs. The first application was to provide psychoeducation to the residents about psychological responses during COVID as well as adaptive coping strategies. Secondly, self-case was emphasized to include sleep, work-life balance, and maintaining social connections (Chew et al., 2020). Thirdly, the residency programs and healthcare institutions identified sources of stigma, such as public attitudes toward the pandemic, and countered them through education to the public. Finally, the residency programs and healthcare institutions demonstrated a long-term commitment to medical resident well-being by offering psychological help, giving residents feedback, and practicing frequent communication.

Impacts in Education

The COVID-19 pandemic has had a significant impact on the planet overall and in everyone's daily lives. It has also wreaked havoc on our higher education. Most institutions had

to shut down their campuses and lost revenue. Students had to abruptly leave their dorms and return home. Both faculty and students had to change teaching and learning styles to distance and virtual modalities to accommodate social distancing guidelines and the initial quarantines. This resulted in faculty delivering virtual instruction with no experience in doing so, faculty and students lacking the required technology for at-home education, and validating assessments and examinations that would otherwise be face-to-face (Piotrowski & King, 2020).

In medical students, one study showed they felt a decrease in the time they spent studying, leading to a decline in their learning behaviors (Meo et al., 2020). Researcher Andrew Ong (2020) studied burnout in a gastroenterology fellowship in Singapore, compromising of 14 clinical fellows, amidst the COVID-19 pandemic. The COVID-19 pandemic disrupted the fellows' regular learning activities, as there was an overall reduction in elective procedures during the pandemic, such as endoscopies. In addition, the gastroenterology fellows were taught dialysis and ventilator management skills as supplemental responsibilities for the care of patients positive with COVID-19. Furthermore, the fellows were not in control of how many hours were worked during these frontline conditions. Although gastroenterology fellowships were affected, Ong (2020) suggested to adjust the assessment process and progression criteria to account for the curriculum disruption made by COVID as a solution. This would help with the issue of reduced opportunities for learning, such as reduced procedures (reduced liver transplants, for example) (Ong, 2020). The intervention implemented by the GI program changed using time-based rotations or procedural numbers. The researcher also discussed interventions implemented in the gastroenterology fellowship program to combat the burnout effects of COVID-19. For example, they created a 24-hour psychologist hotline, they hosted weekly mindfulness sessions via

teleconferencing, and they opened communication between the clinical fellows and program directed thought social media chat groups and monthly newsletters (Ong, 2020).

In graduate medical education, the accreditation council for graduate medical education (ACGME) provided guidance by identifying stages of operation at institutions that was based on how severe the pandemic was felt at that institution. They also suspended regular activities such as site visits, ACGME surveys, self-study, accreditation, and clinical learning environment review (CLER) (Kohan et al., 2020). The ACGME recognized the circumstances brought on by the pandemic and revised its policies to accommodate the need for trainees to provide the best patient care during COVID (Kohan et al., 2020).

Graduate medical education programs identified ways to utilize the pandemic as an educational opportunity. Teleconferencing software for didactics and trainee lectures were developed. Alternative ways were designed to expose residents to medical procedures otherwise halted by COVID-19 (Anton et al., 2020). The downtime was considered for scholarship and board exam review. Trainees were educated in the usage of telehealth equipment, etiquette, and procedures (Anton et al., 2020).

Self-guided learning, a skill taught during medical training, became the norm during this time (Kohan et al., 2020). For example, clinical fellows experienced clinical load variability; some experienced new critical assignments and others participated in telehealth visits from home. The amount of self-directed learning and studying also varied (Kohan et al., 2020).

Aspects of the education system, such as orientations, onboarding, offboarding, and graduations, have also shifted to online modalities. During recruitment season, medical students applying to medical residency programs were interviewed in person and on-site (Huppert et al., 2020). However, the 2021 application cycle was conducted virtually. Fortunately, this modality

shift ultimately saved the applicant money by eliminating travel expenses (Huppert et al., 2020). According to Jones et al. (2020), virtual residency interviews led to an average savings of $566 for applicants, as the 2014 application cycle cost $7500 for matched and $5000 for unmatched dermatology residency applicants. However, a challenge identified was a change in work time for training programs, as some interviews on the east coast would equal to 5 am on the west coast, or even earlier in Hawaii (Huppert et al., 2020). An upside included the flexibility and decrease in scheduling conflicts (Jones et al., 2020).

Online Remote Learning

Online learning, remote learning, or distance learning, is a learning system that utilizes internet media as a learning model (Edy, Widiyanti, & Basuki, 2020). The main element of remote or distance learning is the physical separation between the learner and teacher during instruction (Berg & Simonson, 2016). According to Singh and Thurman, terms used to define online learning include e-learning, online learning, blended learning, online education, online course, distance education, distance learning, web-based learning, computer-based learning, web-based instruction, and distributed learning (2019).

There are four major elements of characteristics of remote learning. The first element is that remote or distance learning is not a self-study but carried out through an institution (Berg & Simonson, 2016). Secondly, students and teachers find themselves separated by geography and even time, offering convenience and accessibility. The third characteristic adheres to the connectivity of individuals through interactive media and telecommunications. Finally, distance or remote learning establishes a learning group composed of instructional resources, students, and an instructor (Berg & Simonson, 2016).

Currently, online learning activities can be implemented through various media, including Google Zoom, Google Meet, or WebEx. Murad et al. (2020) found that remote learning can be effective, meaning increased learner satisfaction, so long as the quality and service of the system is maintained. Online or remote learning is delivered through two methods: synchronous and asynchronous (Murad et al., 2020). Both have become a necessity and are no longer learning model options offered for convenience.

Remote or distance learning has proven beneficial throughout time. Educational institutions benefit from the modality as they can enroll more students without the need to build more housing or lecture rooms. The students, in turn, also benefit as they have the flexibility to work when they choose (Berg & Simonson, 2016). Students also have access to more specialized courses and centralized instruction. Overall, this learning modality provides greater affordability and access to learners (Kentnor, 2015).

History of Distance and Remote Learning

The first recorded instance of remote or distance learning occurred in Boston in 1728 (Pappas, 2013). During the 19th century, religious correspondence education emerged in the United States (Berg & Simonson, 2016). Later, the military, government, and industry demanded vocational training that would result in the progression of distance learning. Also occurring in the 19th century, Europe established mail-order courses, while companies created mail-order correspondence courses in the United States to serve business employers. The majority of nonreligious mail-order correspondence focused on teaching grammar, spelling, bookkeeping, secretarial duties, and business letter composition (Berg & Simonson, 2016).

In 1906, the University of Wisconsin began recording lectures and sent them to students in phonograph form (Pappas, 2013). By 1919, the University began the first federally licensed ratio station that was dedicated to educational broadcasting (Kentnor, 2015). Due to the Great Depression of 1929, education via radio declined. During the 1930s, education was broadcasted via television, initially by the University of Iowa (Kentnor, 2015). Finally, distance or remote learning entered the digital era in the 1980s, where companies trained their new employees utilizing computer-based programs. The World Wide Web set forth in 1991. Universities then began experimenting with online courses in the early 1990s (Kentnor, 2015).

Traditionally, remote or distance learning catered to nontraditional students. These include military personnel, nonresidents, full-time workers, or learners with an inability to physically attend the classroom (Berg & Simonson, 2016). Today, remote learning continues to grow and has established itself as a learning modality in education. Approximately 5.6 million university students were enrolled in at least one course online in the United States in the fall 2009 semester (Berg & Simonson, 2016). The University of Phoenix, one of the earlier adapting institutions of remote learning, has 400,000 enrolled students, becoming the largest provide school worldwide (Berg & Simonson, 2016).

Transitioning into Remote Learning during COVID-19

There was a need to transition to remote learning due to the COVID-19 pandemic. For example, a way to prevent the spreading of the virus or to decrease its spread impact among lecturers, students, and education personnel was to implement remote learning meanwhile complying with health protocols and guidelines (Joko et al., 2020). Considering the modality alone, 100% of the learners are not exposed nor affected by COVID-19 through the means of

remote learning. However, for many instructors, this approach to teaching was utterly new (Konecki, 2020). Instructors, regardless of readiness, underwent the learning process while simultaneously maintaining the quality of user satisfaction towards learning and education (Murad et al., 2020).

There were concerns regarding whether remote learning could produce the same quality of teaching as face to face. To be effective in the transition from face-to-face to remote learning, several factors had to be considered for the creation of a successful experience. Communication between students and instructors must be effective (Serhan, 2020). Students learning online must be engaged and must communicate amongst each other. Finally, the audio must be of good quality, as well as the redesign of instructional activities (Serhan, 2020). Virtual tutorials of platforms, such as Zoom, increased student satisfaction and reduced instructor workload by a fourth.

In Pakistan, teachers were affected by the sudden transition (Noor, Isa, & Mazhar, 2020). They faced an overnight shift to the online teaching mode, causing significant mental, physical, and financial challenges. Teachers did not have confidence in technology, lacked expertise in teaching online, and experienced a lack of technological knowledge. In addition, there was a lack of educational resources, a shortage of facilities, time restrictions, and stress regarding content restructuring for the online teaching culture (Noor, Isa, & Mazhar, 2020).

One study of West Bengalese higher education institutions found students used various platforms for study material sharing, learning evaluation, and e-lectures. These platforms included Skype, Google meets/hangout, Google classroom, YouTube live, WhatsApp, the Zoom app, and Team link (Kapasia et al., 2020). The education content was provided to medical

residents and trainees through teleconferencing during the COVID-19 pandemic (Kohan et al., 2020).

In graduate medical education, lectures also experienced a shift to online modalities. Stanford University internal medicine chief residents, detailed the administrative and clinical changes they experienced during the COVID-19 pandemic. The medical residents turned to them for support as they led morning reports and counseled residents through difficult rotation struggles. However, they did not know how to address COVID-19 concerns (Tisdale, Filsoof, & Singhal, 2020). Their response as chief residents included establishing facts and systems, refocusing on core program values, and planning for the long term. The chiefs taught themselves how to build a website to disseminate COVID-19 related information, which then became a resource for the Stanford community (Tisdale, Filsoof, & Singhal, 2020). Educational core values, wellness, and scholarly activity were prioritized meanwhile maintaining preparedness for patient care. As a result, these chief residents moved education online to include resident research symposiums, noon conference lectures, resident retreats, and graduation celebrations. Asynchronous learning was initially utilized to fit the scheduling needs of medical residents and chief residents. Clinical vignettes were developed via e-mail to be discussed in teams (Tisdale, Filsoof, & Singhal, 2020). Because the e-mails did not have the same impact as interactive case-based morning reports, morning report conferences then transitioned to Zoom.

Boston Children's Hospital pediatric cardiology fellowship program did not have an established learning management system at the onset of COVID-19 (Teele et al., 2020). This group of trainees had a limited role on the frontline during the pandemic. The program leadership, therefore, created learning goals and desired results to promote effective remote learning to its clinical fellows. The program centralized currently available learning resources

and tools from across the program. They created an online community to provide social support and solidify professional and personal relationships regardless of physical isolation (Teele et al., 2020). The program elicited real-time feedback to adjust and modify interventions in order to best meet the needs of educators and learners. Additionally, they utilized and curated high-quality resources, including pre-existing online resources, trainee and faculty expertise, and unstructured time to create a helpful learning tool. Finally, they provided high-yield learning opportunities, both synchronous and asynchronous in nature, to engage faculty and trainees through remote learning (Teele et al., 2020).

Overall, graduate medical education transitions to digital platforms for remote learning, where journal clubs, grand rounds, and didactics were held (Kaul et al., 2021). Teamwork management programs such as Asana and Slack were utilized, in addition to game-based learning platforms such as Kahoot and social media networks such as Twitter. Through these means, concepts were reinforced. Feedback of such changes was found to be engaging for resident learners (Kaul et al., 2021).

Synchronous learning opportunities, or education of a group of people simultaneously occurring in real-time, included online Zoom conferences (Teele et al., 2020). Core conference schedules were deployed online, and trainees were able to attend two or three one-hour sessions per day regarding a variety of topics in pediatric cardiology. Asynchronous learning opportunities, or education that occurs independently of a specific place or time, included voluntary team-based projects that utilized active educational strategies to reinforce and promote learning (Teele et al., 2020). This approach allows the trainee to actively learn and engage with the subject material on their own. In addition, innovative solutions to educational challenges were disseminated through peer-reviewed journal articles. Medical content was also shared

through the Free Open Access Medical (FOAM) movement that began in 2012 (Teele et al., 2020). Through these measures, the clinical learning system was redesigned from remote learning.

Benefits of Remote Learning during COVID-19

A study conducted with undergraduate college students illustrated the participant's perceptive advantages to remote learning using the Zoom platform. The main advantage was found to be the flexibility of the modality. Other benefits included the ease of interactions, the use of multimedia, and written communication (Serhan, 2020).

Mobile learning was found to be effective in improving student competence (Joko et al., 2020). Remote learning meets various student learning styles due to the different technological modalities available in remote or mobile learning. This learning also offers opportunities for social interactions that help achieve high standards of academic performance and learning (Joko, 2020).

Joko et al. (2020) found supporting factors for students in the implementation of mobile learning and increasing student competence through their study consisting of 116 students from Surabaya State University. Very supportive factors included the fun of mobile learning, semester course plans, material, audio, video, interactive modules, time duration, and evaluation; the use of collaborative software to work together, the ability to access information and online materials, the discipline to apply COVID-19 protocol, and the motivation and support for internet data packages from parents, and the student's health condition (Joko et al., 2020). Supporting factors in the implementation of online learning included the learning platform, where the e-learning content was compatible with the mobile device, the ability to communicate via WhatsApp or

email, the ability to learn in a calm and relaxed manner, the ability to complete assignments and evaluations on time, and the possession of smooth internet. Comparatively, sufficiently supportive factors included the ability to plan and use time wisely, the student's seriousness of learning, the conducive learning environment in the student's home, and adequate handphone screen size (Joko et al., 2020).

Due to the pandemic, face-to-face classes were replaced with Zoom lectures in one study conducted by Agarwal and Kaushik (2020). They assessed student perceptions of the lecture series and found that 97% of participants found the Zoom sessions were relevant to their clinical practice and learning needs. The majority of participants, 99%, indicated Zoom should be made part of the regular medical curriculum (Agarwal & Kaushik, 2020). An investigation by Demuyakor (2020) studied the satisfaction levels of online learning from Ghanaian international students in higher education institutions in China. They were satisfied with the transition from face-to-face to online. They also perceived the online courses to be effective (Demuyakor, 2020).

The undergraduate medical curriculum also changed. For example, final examinations were switched to online. Many medical schools adopted an open-book examination (OBE) approach (Sandhu & de Wolf, 2020). One benefit of this change was that open book examinations were shown to reduce anxiety in students. In turn, minimizing negative symptoms in students lessens the stress caused by shifts during the COVID-19 pandemic (Sandhu & de Wolf, 2020).

In graduate medical education, the COVID-19 pandemic served as an educational opportunity, where trainees learned about epidemiology, advocacy, population health, and systems-based care (Anton et al., 2020). Programs were also successful in providing interactive sessions, such as morning report and didactics over conferencing software. Online discussions of

board examination questions and topics were provided (Anton et al., 2020). Specialty exposure was also provided through the use of faculty-led review of surgical videos and simulation centers for trainees in radiology, surgical specialties, and radiation oncology who were not able to participate in enough clinical cases and activities to advance in their training (Anton et al., 2020). In addition, time that would have been spent in clinical duties was spent in scholarly activity. Finally, protocols for teaching trainees remotely during the onboarding orientations were considered.

A Saudi Arabian medical school experienced benefits from effective asynchronous online learning and was well-accepted by its medical students. Online learning produced a positive educational impact, including educational improvement because of increased content understanding (Khalil et al., 2020). Online learning improved time management through time utility and more study opportunities. In addition, commute time to face-to-face classes was eliminated. Another study of a Saudi Arabian school concluded that the pandemic boosted the participants' confidence in online medical education effectiveness (Rajab, Gazal, & Alkattan, 2020).

Chief medical residents transitioned morning report conferences to the online platform Zoom and made them less formal. Residents participated through verbal discussion and through the Zoom chat box, and faculty members went by their first names (Tisdale, Filsoof, & Singhal, 2020). Another benefit of the informality of remote learning was the sense of personal views, as residents could see into each other's homes through webcams. Medical residents who were physically in the hospital participated in these conferences along with their attendings, allowing for the opportunity of parallel discussions that furthered learning (Tisdale, Filsoof, & Singhal, 2020). Yet another benefit was the opportunity for skill-building and inventiveness needed to

adapt to remote learning. In this program, the resident research symposium was also held fully online to further promote scholarly activity. The benefit in remote learning regarding scholarly activity was that poster presentations were now presented to larger groups of academic faculty.

Wellness & Mental Health

No studies were found detailing how remote learning may have resulted in positive outcomes toward learner mental health. One cannot conclude there were no positives. Tisdale, Filsoof, and Singhal (2020) discussed ways in which resident wellness was supported during the transition to remote learning. Cooking sessions and workouts were planned via Zoom to regain their sense of community. Game nights were also held remotely, and guest hosts were sometimes invited (Tisdale, Filsoof, & Singhal, 2020). However, this has become an area of need for further research. Perhaps the ability to stay home, decreasing the chances of COVID-19 infection, may have brought students peace of mind or decreased overall anxiety regarding the pandemic and learning changes.

Barriers with Remote Learning during COVID-19

Plenty of issues have been found with remote learning. Because universities had to move from face-to-face to remote instruction, Zoom was utilized as the delivery platform at many institutions. A study was conducted at Arizona State (Serhan, 2020), which found student participants had negative attitudes toward the use of Zoom. The participants felt it negatively affected their learning experience and motivation to learn. These disadvantages included distractions, low quality of interaction and instructor feedback, experiencing poor educational qualities, and technical difficulties (Serhan, 2020).

E-learning disintegration can be caused by several factors. These include content usability, the quality of the course, the availability of technical assistance, technological ease, as well as the likelihood of interaction with other students (Hasan & Bao, 2020). The authors Hasan and Bao (2020), also explain that most of the breakdowns within e-learning are technologically based, where hardware and software support is unavailable. Yet another barrier found was the lack of readiness or knowledge in implementing e-learning. Internationally, students were found to not have equal opportunities due to discrimination against better family facilities (Hasan & Bao, 2020).

Poverty exacerbates problems with digital learning. In higher education, Kapasia et al. (2020) conducted a study regarding the impact that the pandemic lockdown had on the learning status of higher education students. Of their study participants, 78% believed that their family's economic condition would be affected by the COVID-19 pandemic, 76.7% believed that low family income would affect their education, and 75.9% believed COVID-19 might cause their educational discontinuation (Kapasia et al., 2020). Students suffered from poor internet connectivity and the absence of a favorable study environment at home. Poor economic conditions may be a reason for the lack of a designated study area and an unfavorable environment (Kapasia et al., 2020). Many of the students could not attend online classes. For example, students living in marginalized and remote areas were denied online learning due to a lack of electricity. Moreover, approximately 42% of participants reported suffering from anxiety, depression, and stress (Kapasia et al., 2020).

According to Konecki (2020), student disengagement for long periods of time within higher education institutions can lead to increased dropout rates. In addition, self-discipline and motivation are decreased, as students feel less motivated to attend remote classes because there

may not be a proper home study environment. Classroom learning was also found to be preferred over online learning, ensuring more student involvement (Konecki, 2020). There is also the fact that educational institutions such as colleges or schools provide education but also facilitate curricular activities to promote social activity for students. Another challenge of remote learning is that students become confused regarding their academic progress because internships, trainings, board exams, and competitive exams were canceled during COVID-19 (Konecki, 2020). This may have posed an issue for medical residents needing to take their USMLE Step 3 board exams. Finally, the fact the student themselves is responsible for their learning during online learning is a challenge (Konecki, 2020).

A Pakistani study conducted by Abbasi et al. (2020) in a medical college concluded that students did not prefer e-learning in comparison to face-to-face instruction during the pandemic. The participants indicated an increase in isolation and a decrease in student-teacher interaction (Abbasi et al., 2020). They also mentioned that online teaching was not secured and raised privacy concerns, as students could misuse an identity online. The study was consistent with student behavior in China, Singapore, and Malaysia pertaining to finding limitations with online learning regarding lab and clinical environment, therefore making remote learning less appealing (Abbasi et al., 2020).

A study conducted in a medical school in Saudi Arabia found that 41.8% of its participants had little or no online learning or teaching experience prior to the pandemic (Rajab, Gazal, & Alkattan, 2020). As a result, 62.5% preferred to blend online and face-to-face teaching. Challenges reported with remote learning included communication issues, issues with assessments, pandemic-related stress and anxiety, and time management. The use of technology

tools, the online experience, and technophobia was also experienced challenges (Rajab, Gazal, & Alkattan, 2020).

Online learning instructors needed to understand student motivation during the remote classroom learning process (Edy, Widiyanti, & Basuki, 2020). However, it was found that student motivation in online learning is difficult to assess due to the lack of direct contact between students and instructors. Without analyzing proper learning outcomes, instructors are not able to create and employ strategies to keep students motivated and engaged (Edy, Widiyanti, & Basuki, 2020).

One study assessed the difficulties in remote learning among Philippine university students. There appeared to be a consensus among developing countries, such as poor telecommunication systems due to not being properly developed. The researchers Rotas and Cahapay (2020) learned university students experienced unstable internet connectivity and inadequate learning resources. In addition, there were electric power interruptions and conflicts with home responsibilities. Within the learning modality, students complained of vague learning contents, poor peer communication, and overloaded lesson activities (Rotas & Cahapay, 2020). The participants stated there was sometimes not enough space on their phone or electronic device's memory to support learning platform applications such as Zoom, Adobe Reader, or Moodle. They also tried to listen to lectures, such as on Google Meet but failed to adequately understand the lessons (Rotas & Cahapay, 2020). On a personal level, they also suffered from financial hardships, physical health compromises, and mental health struggles as a result of the COVID-19 pandemic (Rotas & Cahapay, 2020).

The impact of technologies during the pandemic for improving behavior intention to use e-learning was investigated by Tawafak et al. (2020). Their findings concluded that there was

weakness in the time for the additional work of audio files to record and be distributed by class blogs in video-based applications. Some students experienced stress in not being able to upload their videos at all. Some students were too shy to ask questions in group chat rooms (Tawafak et al., 2020). The researchers also recommended adding a translator technique to convert the voices of students to typed text to assist in reading and reducing time in typing (Tawafak et al., 2020).

Because of the challenges in technology-enhanced learning, the ministry offered a new policy to provide solutions and help its students in Middle Eastern countries such as Oman. For example, there was free internet use for materials and videos with a .edu extension (Tawafak et al., 2020). Secondly, students were encouraged to work in teams to provide one another support with course material. Thirdly, hotline calls were kept to provide student support to those who did not have personal computers. The college and ministry donated devices based on the economic hardship of students (Tawafak et al., 2020). Fourthly, free time of access was offered, where students could utilize the Moodle platform at any time to watch recorded lectures. Finally, the evaluation process was changed from live exams or compulsory attendance to projects and reports about offered topics (Tawafak et al., 2020).

In K-12 teaching, the inaccessibility to consistent technology was a common challenge with remote learning. Online instruction required devices such as laptops as well as internet access. Schools in Florida, such as in Miami, Jacksonville, and Duval County, distributed laptops, technological devices, and hotspots for their students (Carpenter & Dunn, 2021). California also partnered with Google to provide Wi-Fi to some households, while Los Angeles purchased computers and partnered with Verizon to provide internet for students. Nevertheless, many households still lacked the necessary requirements for students to participate in virtual instruction (Carpenter & Dunn, 2021). In addition, differences in learning activities were found

between public and private school students. For example, one study found almost the majority of public students connected with their teachers less than once a week, while 66% of private school students connected with their teachers at least once per day (Carpenter & Dunn, 2021). Private schools, therefore, appeared more innovative, engaged, and responsive in comparison to public education in the K-12 sector, as they may have had more significant resources.

Pakistani schools experienced educational challenges to remote learning. Lecture preparation had to be creative to maintain student engagement, but there was poor content development. Students also had to obtain confidence in this new learning style. Students experienced a lack of support, limited feedback, and low attendance (Noor, Isa, & Mazhar, 2020). Electronic devices were scarce, and internet packages needed to smooth connectivity were expensive (Noor, Isa, & Mazhar, 2020).

In the past, Philippine educators were hesitant to use technology, assuming it would replace them and make them obsolete in the classroom. During the COVID-19 pandemic, however, they switched to emergency remote teaching (ERT) (Alvarez, 2020). Aside from the teachers, the students experienced negative outcomes due to the remote learning shift. Students in this phenomenological study taking place in the Philippines experienced poor to no internet access, financial constraints, a lack of technological devices with which to access remote learning. They also felt unsafe due to the climate of the rapidly spreading disease, hindering them from learning. Because they felt mentally and emotionally stressed, they did not see a need to study lessons during the crisis (Alvarez, 2020). Learning engagement was therefore interrupted due to the problems with access, affordability, financial stability concerns, and effective support.

In graduate medical education, technology blurred the boundaries between medical residents' work and home life. The residents managed learning, their office work, their

households, and taking care of others (Sethi et al., 2020). As a result, the medical residents felt they had no excuse for being unavailable due to being physically quarantined at home while not at work.

Regarding assessment and examinations, remote learning also posed challenges. One Jordanian study questioned how to maintain the integrity of the curriculum through remote learning. Due to the COVID-19 pandemic, remote electronic exams (e-exams) were adopted as the primary mode of learner assessment (Elsalem et al., 2021). The study concluded that only one-third of participants preferred remote electronic exams in medical fields such as medicine, dentistry, pharmacy, applied medical sciences, and nursing. Academic dishonesty became a problem with remote learning and electronic testing (Elsalem et al., 2021). In sum, remote learning made the ability to guarantee and fulfill curriculum delivery, integrity, assessment, educational outcome achievement, and curriculum objectives challenging (Elsalem et al., 2021). A study investigating the advantages and limitations of online learning during COVID-19 in Pakistani institutions also mentioned that maintaining academic integrity because of plagiarism or a lack of student discipline, as well as the issue of proctoring to manage integrity, had become limitations within remote learning (Mukhtar et al., 2020).

Wellness & Mental Health

The COVID-19 pandemic has affected this year, and this planet, in more ways than one. Medical residents and medical fellow trainees are at the forefront of this epidemiological fight. Outbreaks of infectious diseases have been found to significantly impact the psychology and physical well-being of medical providers and medical trainees (Chew et al. l, 2020). Studies have shown that medical providers have suffered from significant levels of increased anxiety among prior pandemics, in addition to COVID-19, including the 2002-2003 SARS outbreak, 2012

MERS outbreak, and 2009 H1N1 pandemic (Shanafelt, Ripp, & Trockel, 2020). In addition to anxiety, medical residents and clinical fellows with children experience pronounced burnout due to school and daycare closures. Medical residents and clinical fellows may further feel overwhelmed by a lack of work-life balance as they work from home and continue their clinical activities (Bansal et al., 2020).

Students experience mental health issues, such as anxiety and depression, while undergoing their educational careers. This educational career includes the undergraduate, graduate, medical school, and medical residency levels. Approximately one-third of college-enrolled students meet the diagnostic criteria of a psychiatric disorder (Lipson et al., 2016). These researchers also stated that campus counseling centers reported an increase of over 90% in the prevalence of psychological issues within their students. Mental health has also become a major issue within postgraduate scholars, such as in medical residency programs, for example. Suicide and suicidal ideation are concerns across residencies. For example, suicides have been reported in first-year medical residents in New York. Medical residents are known to suffer from several mental health issues, such as anxiety, depression, and burnout (Slavin & Chibnall, 2016). One study conducted by Abdulrahman et al. l reported burnout in 70% of their medical resident participants (2018). The COVID-19 pandemic and the shift to remote learning may have exacerbated the prevalence of mental health challenges in learners.

Remote learning may have resulted in challenges and deficiencies regarding the wellness and mental health of learners. According to a study conducted by Hasan & Bao (2020) in Bangladesh, college students were found to suffer from psychological distress because of ineffective e-learning systems. In addition, the fear of academic year loss was also found to be a mediating role. Students showing negative perceptions of online learning behavior might also be

a responsible factor leading to psychological distress. The distress, culminated in the form of anxiety, can be due to a lack of enjoyment in the classroom (Hasan & Bao, 2020).

Within pain fellowship programs, a panel of pain program directors was assembled to provide guidance and recommendations to ensure proper fellowship education (Kohan et al., 2020). Due to restrictions from the Centers for Disease Control and Prevention, as well as state governments, fellows' learning environments had changed. This panel reviewed the current guidelines set forth by the Accreditation Council for Graduate Medical Education (ACGME) and provided their opinion regarding the use of wellness among trainees, scholarly research opportunities, and remote educational activities. The researchers realized that to encourage mental health and alleviate anxiety among trainees, they would have to implement innovative solutions with the utilization of technology (Kohan et al., 2020).

Impacts of Learning Across Grades during COVID-19

Learning was impacted across all academic grades. A significant theme experienced at the undergraduate higher education level and K-12 was that of equity and accessibility. Students, parents, and teachers required increased support as online learning had never been trained for or delivered in many educational institutions worldwide (Burwell, 2021). Some schools, such as in Dubai, empowered and educated the parents, many of whom were not fluent in the language, through bi-weekly Zoom meetings. Burwell (2021) posed the notion of meeting Maslow's hierarchy of needs for both students and their parents, and finally, the instructors. Konecki (2020) also mentioned parents had played an active role in student's learning due to the pandemic.

Graduate Medical Education

Program Impacts

The COVID-19 pandemic impacted not only the education sector but also graduate medical education. Surgery residents lost electives and experienced less clinical exposure during their training to reduce unnecessary COVID exposure (Adesoye et al., 2020). The loss of case volume and clinical exposure unequivocally jeopardized the quality of training in general surgery. Learning aside, medical residents who were beginning training and had applied for J1 visa waivers experienced significant delays in visa approval (Kaul et al., 2021). These trainees provide services to underserved areas, creating a more considerable shortage during the pandemic.

An internal medicine residency training program in Singapore experienced challenges of its own. The COVID-19 pandemic disrupted the execution of their residency program. The outbreak offered unique learning opportunities, but the faculty's usual educational role was challenged (Kee, Archuleta, & Dan, 2020). The faculty realized they were no longer content experts but were experiencing the same learning curves as their medical residents.

A dermatology residency shifted clinical procedural education online (Jones et al., 2020). For example, virtual microscopy served as an educational medium for teaching dermapathology. They also utilized teledermapathology, utilizing phones and tablets for microscopy applications. This allowed for an interactive medium with which to deliver dermatology instruction. Additionally, the researchers proposed an opportunity for educational initiatives across graduate medical education to incorporate a universal online learning platform for residents nationwide to learn from field experts on topics outside of their specialty (Jones et al., 2020).

Program Solutions

One cardiovascular fellowship conducted lectures via Friday morning didactic conferences. At the onset of the COVID-19 pandemic, it implemented didactic teaching through Zoom and Microsoft Teams (Almarzoo, Lopes, & Kochar, 2020). Collaboration and lecture were successful through these means, and the researchers believe similar virtual learning platforms would be beneficial even after the pandemic, as speeches can still be delivered to residents not able to attend in person due to paternity leave, for example (Almarzoo, Lopes, & Kochar, 2020).

In a general surgery residency, the educational shift focused on intensive didactics and utilizing teleconferencing platforms (Adesoye et al., 2020). The program also focused on residents' weakness areas from their in-training exams to further improve assessment scores. Finally, the prioritized essential COVID-19 literature by implementing a weekly journal club to understand its effect on the surgical practice.

An internal medicine residency training program in Singapore found that the challenges created by COVID-19 created opportunities in creative teaching regarding system-based practice, communication skills, and practice-based learning (Kee, Archuleta, & Dan, 2020). The COVID-19 pandemic allowed for case studies regarding medical ethics and professionalism due to the inherent need for patient confidentiality and mandated isolation. Regarding resident education, the authors learned to utilize COVID to teach ACGME competencies (Kee, Archuleta, & Dan, 2020). The program employed video conferencing tools instead of face-to-face modalities and shared COVID-19 knowledge on instant messaging group chats. Additionally, they de-emphasized large group didactics. Regarding resident burnout and wellness, they rotated medical residents from pandemic to non-pandemic teams, the program paid for hotel

accommodations, and the program leadership regularly checked in with stressed residents to keep burnout at bay (Kee, Archuleta, & Dan, 2020).

Medical Education and Medical Students

Perhaps the heaviest hit in medical education by the pandemic were medical students. They suffered from a lack of away rotations (Kazarian, Conger, & Tracy, 2021). A study regarding an advanced urology elective surveyed 84 fourth-year medical students matching into medical residency. The researchers found that advanced virtual electives may provide a viable replacement for lost away rotations. Medical students preferred the structure of these electives to be two weeks or less and for five hours or less per day. The students also desired electives to have networking opportunities with residency programs, didactics, the ability to assess their fit within the program, and the potential of sharing program information (Kazarian, Conger, & Tracy, 2021).

Faculty members abruptly adjusted the learning experiences to remote activities and online cases to prepare students for exams and build clinical reasoning skills without face-to-face patient interaction (Sierpina, 2020). Academic and community teaching faculty practiced were limited in their capacity to accept medical students for clinical training due to the pandemic. This increased the issues of the everyday stress from intense medical school training (Sierpina, 2020). Many medical students requested medical leaves due to mental health issues as a result, and graduation ceremonies were canceled. Clerkships were shorted as the academic year was also shortened (Sierpina, 2020). The summer months were used for make-up time for students beginning their 4th year in medical school and to provide pre-clinical skills-building opportunities for students starting their 3rd years (Sierpina, 2020).

In the past, successfully entering residency incorporated doing well on the Step 1 board exam, obtaining shadowing opportunities, doing well during clerkships, presenting at conferences, and having non-academic extracurricular activities (Ferrel & Ryan, 2020). This demonstrated the medical student's persistence, knowledge, dedication, and collaboration. Because of the shift to online learning, collaborative experiences were lost, and clerkships were canceled (Ferrel & Ryan, 2020). With the decreased opportunities for academic progress, medical students have become weak applicants for medical residencies. Medical students from disadvantaged backgrounds may also be more affected by the challenges, such as experiencing a decreased chance of direct interaction with faculty that can write them strong letters of recommendation for residency (Kaul et al., 2021).

A primary concern of medical student education pertained to how they would perform during their residency training due to the educational changes during their medical school career. The future safety of patients may be affected as a direct result of the COVID-19 pandemic. In a study conducted by Ikhlaq et al. (2020) regarding the awareness and attitude of undergraduate medical students toward COVID-19, approximately 90% of medical student participants knew the etiology of the virus. Still, only 80% of participants had sufficient knowledge. Researchers from the Mayo Clinic concluded that there was a need for medical educators to find ethical, effective, and transparent measures to deploy medical students, residents, and fellows while simultaneously reducing their risk of exposure (Barach et al., 2021). Otherwise, the COVID-19 pandemic may have culminated in lost learning opportunities for medical students.

Hauer, Lockspeiser, and Chen (2021) alternatively propose areas for change to advance the medical student despite the COVID-19 pandemic to improve the undergraduate medical education (UME) to graduate medical education (GME) transition. One difference is that of

assessments, implementing different assessment strategies that will allow a view of the learning to assess their strengths and areas for growth (Hauer, Lockspeiser, & Chen, 2021). A second change is to defined outcomes in order to adapt and shorten learning experiences by focusing on the student completion of prespecified learning outcomes. Finally, the UME-to-GME transition could be enhanced via means of communication to residency directors regarding performance data (Hauer, Lockspeiser, & Chen, 2021).

Medical students who were part of the Class of 2020 experienced moving states or countries during the COVID-19 pandemic to begin their respective medical residency training, causing significant issues (Byrne et al., 2020). Relocation issues included protocol regarding quarantine measures upon their arrival. A thorough assessment of clinical skills and preparedness for duty in the high-risk clinical setting was necessary. Extensive orientation to personal protective equipment requirements and infection control policies should also have been implemented to ensure medical resident readiness into their transition to medical residency (Byrne et al., 2020).

Undergraduate Level and K-12 System

Remote learning took place worldwide and in different ways. In Mexico, for example, the nation looked at offering online learning through local radio stations and network television providers to ensure their students all had fair and equal access to an education (Burwell, 2021). Radio and TV are powerful tools that can provide education delivery, which contact can be maintained between students and instructors through social medial like Facebook, SMS, and WhatsApp (Konecki, 2020). In the United Arab Emirates, students thrived through the remoted educational environment. The new modality resulted in a decrease in bullying, as students

described no longer being teased and learning to love the online learning experience as a result (Burwell, 2021).

Teaching during COVID-19

Teaching as a whole changed as a result of the COVID-19 pandemic. As Hasan and Bao (2020) explained, the implementation of successful e-learning systems is dependent on how the program is performed by instructors and students. Satisfaction can be improved by ensuring course designers offer authentical learning experiences that encourage active learner participation to increase deeper learning and engagement (Sethi et al., 2020). The researchers also recommended faculty development in the areas of lesson planning and online modalities.

Alvarez (2020) suggests academic policymakers implement new strategies to make learning accessible and inclusive to all. All students and their different socioeconomic circumstances should be considered. For example, emergency remote teaching (ERT) could incorporate asynchronous teaching, to include modules and worksheets. Finally, higher education institutions should allocate a budget to train their faculty in teaching remotely (Alvarez, 2020). Kapasia et al. (2020) suggest prioritizing creating positive study spaces for students.

Carpenter and Dunn (2021) found one teaching approach to be allowing students to work through weekly assignments independently, sent to the students at the beginning of the week. If the students needed help, they could reach their teachers, who took adviser roles, during their office hours. Educational resources, such as worksheets, live online instructions, and hardcopy packets, were provided by most schools (Carpenter & Dunn, 2021).

Best Practices

Almarzoo, Lopes, & Kochar (2020) proposed implementing a virtual learning platform for medical education with key features. The platform would allow for integration as their utilized application could be used on multiple technological devices and collaboration by sharing and editing documents as well as having access to colleagues. In addition, the platform contributes to education by allowing the streaming and recording of conferences, sharing educational materials, and the option to poll audiences. Communication is the final feature, which includes virtual meetings, reducing the burden of e-mails, and sending program announcements that can target specific audiences (Almarzoo, Lopes, & Kochar, 2020).

Murad et al. (2020) recommended standardization of learning modules from their study in Indonesia regarding the impact of the COVID-19 pandemic on face-to-face versus online learning. Good infrastructure must be available in online learning; student and instructor interaction are not sufficient. Communication and interaction during the learning process must be facilitated. Learning materials must also be delivered according to the needs of the learners (Murad et al., 2020).

Instructors could approach remote learning by either developing novel pedagogical practices or by repurposing their existing practices (Giordano & Christopher, 2020). Instructors of chemical education, for example, added pass/fail options to their courses. Some administered remote oral exams instead of online multiple-choice exams, where students demonstrated a passing understanding of general chemistry. A virtual modality, Microsoft Teams, was used to administer remote oral final exams (Giordano & Christopher, 2020).

Faculty and staff members should be offered training workshops to learn the different teaching methodologies, different technologies, and assessment techniques (Serhan, 2020).

Institutions should additionally adjust their pedagogical practice to better adapt to students' learning needs outside of the physical classroom. Faculty and teaching assistants also require adequate support to students to include feedback in a timely manner (Serhan, 2020). Finally, instructors should develop a contingency plan; should unexpected incidents in online education platforms occur, another strategy can be implemented.

Whittle et al. (2020) provided an education framework through their study to be utilized for emergency remote teaching environments (ERTE), such as during the COVID-19 crisis. The researchers provided a conceptual framework for teachers to plan and researchers to conceptualize learning during a crisis. Rather than focusing on learning goals, the focus is on the delivery method of education (Whittle et al., 2020). By evaluating remote teaching experiences, instructors can design a remote teaching plan that supports constants and addresses variables provided by the crisis. Instructors can then classify their available resources into constants and variables and finally inquire about the circumstances and resources available (Whittle et al., 2020).

Lessons Learned

A study conducted in Pakistan by Sethi et al. (2020) recommended to Pakistani and Chinese medical training program leadership should allow their residents to create routines, have designated space to work and learn, and should discourage trainees from multitasking. The researchers believed that working from home should not mean being available 24/7. In addition, the researchers found solutions to the limitation of the inability to reach skills. These solutions included the utilization of procedural videos and synchronous demonstrations. Technical skills could be taught through 3D or virtual learning technologies (Sethi et al., 2020).

Redinger, Cornia, and Albert (2020) recommend the utilization of constructivist learning theory to adapt to a virtual classroom during the pandemic. This theory emphasizes the learner's experience instead of the information transmission by the instructor. Instructors should conduct a practice session to familiarize themselves with the online platform and to uncover any possible glitches that may occur (Redinger, Cornia, & Albert, 2020). Expectations should be verbalized at the beginning of a lecture to identify which technological tools will be utilized or which communication modality is expected. Learners should be engaged through the use of enabled cameras, screen sharing, and operating small group breakouts. Finally, instructors should solicit feedback at the end of a lecture session and implement the suggestions into the next lesson plan (Redinger, Cornia, & Albert, 2020). In addition, informal teaching should be embraced in the form of experiential learning opportunities. Medical residents have learned through first-hand observation of COVID-19 and through their mentors' actions regarding the outbreak (Redinger, Cornia, & Albert, 2020). Finally, mental health resources could be promoted during morning report, and brief reflection sessions could be incorporated as well.

Huang et al. (2020) proposed an open education practices (OEP) framework to minimize disruption during the COVID-19 outbreak in China. Instructors should build their online curriculum around open educational resources to implement practical pedagogical approaches that will keep students engaged and active. This includes asking students to solve problems, conduct research on different topics, and write reports. Instructors should enable technologies to support a connected learning community (Huang et al., 2020). Educators would then promote teaching methodologies that would allow students to construct their own learning pathways. Collaboration through working in teams would allow for exchanges of ideas and discussions

related to learning tasks. Students would also evaluate one another to improve learning outcomes (Huang et al., 2020).

Flipped Classroom

One teaching approach implemented in graduate medical education prior to the COVID-19 pandemic was the flipped classroom, an effective and progressive curricular model (Wittich et al., 2018). This instructional method encourages interactive learning and applying clinical reasoning, which is favored over traditional lecture-based methods (Blair, Caton, & Hamnvik, 2020). The flipped classroom is a teaching format that allows learners to learn and process the information on their own before class and then apply what they have learned during class through facilitated small-group activities and discussions (Wittich et al., 2018). The theoretical benefits of this format are rooted in active learning and social constructivism theory (Riddell et al., 2017). Classroom time is spent in Bloom's taxonomy's higher levels of application, analysis, and evaluation (French et al., 2020). Therefore, the flipped classroom adhered to general adult learning needs.

One pilot study comprising of internal medicine medical residents found that trainees preferred the flipped classroom format (Blair, Caton, & Hamnvik, 2020). Trainees watched videos outside of the classroom on the pharmacological treatment of type 2 diabetes. The trainees then had an in-class session where they had case-based discussions on the topic. It resulted in increased knowledge and promoted interactive case-based learning. However, the flipped classroom format may not be feasible in graduate medical education due to its required preparatory time (Blair, Caton, & Hamnvik, 2020). Pre-class preparation time is exhaustive to medical residents with full training scheduling residency working hours. Without adequate pre-

class preparation, they would not be able to participate in applying the knowledge while in the classroom (King et al., 2019)

The success of the flipped classroom in graduate medical education has shown mixed results. Another study conducted by Riddell et al. (2017) with three emergency medicine residency programs, however, found that while comparing the standard lecture with the flipped classroom format, performance was essentially the same; the flipped classroom did not result in greater learning gains. Comparatively, a review conducted by King et al. (2019) concluded the approximately half of the studies that compared the traditional classroom to the flipped classroom format reported better achievement with the flipped classroom design.

The format has shown benefits across educational levels. For example, higher class attendance and test scores were experienced in an undergraduate physics course when utilizing the flipped classroom format (Wittich et al., 2018). In a medical school radiology clerkship, it improved knowledge when compared to traditional lecture alone. Wittich et al. (2018) found that most internal medicine residency programs utilize the flipped classroom to some extent. The format allows learners to engage in small-group discussions to apply knowledge to clinical scenarios.

The ACGME requires one hour of conference credit for asynchronous learning per week (Riddell et al., 2017). Thus, educational lectures and didactics will continue regardless of the pandemic. A benefit to the flipped classroom is its focus on andragogy and its promotion of adult learning. Learning theory indicates that knowledge that is more thoroughly understood degrades at a slower rate (French et al., 2020). Due to its effectiveness and popularity in graduate medical education, more research is needed regarding its applicability to didactic education through remote learning during COVID-19.

CHAPTER 3: METHODS

Introduction

The primary goal of this phenomenological study was to understand the lived experiences of internal medicine medical residents during their transition to remote learning in three different internal medicine programs at three different hospital sites within one large higher education institution in Florida, as stated in Chapter 1. The protocol used will be discussed in this chapter. The methodology employed is also presented in this chapter. The chapter is organized into four sections: (a) participants in the research study, (b) protocol of the research study, (c) data collection of the research study, and (d) data analysis for the research study. Thus, this chapter will explain the structure of the research design for the study.

Participants in the Research Study

Targeted Participants

The targeted participants in the study are comprised of medical residents employed and training at a major state university in Florida. These medical residents have been trained in internal medicine since the spring of 2020. Demographics such as the age, race, ethnicity, and gender of a participant were not relevant in the selection of participants but were noted during the interview. The ideal participant pool included a few medical residents from each hospital site of this academic institution. The number of participants was eleven.

Graduate medical education is the graduate world after a physician attends medical school. Medical residents are not beyond medical school but are still students training in their chosen medical specialty. Residents work at hospitals and medical centers on clinical rotations treating patients in addition to attending lectures tailored to their medical board exams. Clinical

fellows are fully credentialed physicians who can practice medicine independently but who have chosen to further specialize through a fellowship post-residency (American Academy of Orthopaedic Manual Physical Therapists, 2022). Similar to a residency program, there are clinical rotations and lectures tailored to assist fellows with passing their board exams.

Medical residents and clinical fellows are required to complete a specified number of hours, as specified by their specialty, and meet certain milestones, or educational objectives, in order to successfully complete and graduate their programs (American Academy of Orthopaedic Manual Physical Therapists, 2022). In contrast, chief residents are individuals who already completed their medical residency training and either want to obtain administrative and instruction experience to pursue a career in academic medicine, or obtain experience before continuing into a clinical fellowship training program. For clarification, chief residents are not learners or students, but rather instructors and program administrators. However, chief residents were once medical residents. There were three study participants interviewed who had chief residency experience after their internal medicine residency program, or who are currently chief residents after having graduated residency last year.

The participants of interest in this study included both medical residents, chief residents, and clinical fellows who were medical residents during the onset of COVID-19 in the United States. Medical residents currently in their intern (PGY-1) or first year of the program were considered but not preferred as they began their training in July 2021, over a year after the pandemic began.

The researcher would have liked to include participants who are currently in their training program, preferably in their second or third year, or have completed their training program within the past year. This would have allowed the researcher to assess whether there

have been improvements in the structure of their learning and instruction by comparing the experiences of alumni and current trainees. Again, the researcher would not have been searching for specific gender or age quotas. The majority of medical residents, however, are in their mid-to-late-twenties or early thirties since they usually train immediately after graduating from medical school. They also experience an immense workload, generally working up to 80 hours per week (Linville & Bates, 2017).

Selection of Participants

Participants had been selected within the Graduate Medical Education (GME) department of a prominent Florida public institution's medical school. Currently, there are approximately 26 medical residency programs and clinical fellowship programs, spanning several regional medical centers across Florida: in Kissimmee, at a Veterans Affairs Medical Center, in Ocala, Gainesville, in Tallahassee, and in Pensacola. The internal medicine medical residents at this institution or the chief residents or clinical fellows who were residents in internal medicine during the Spring and Fall of 2020 were invited to participate. The participants must have experienced the phenomenon being studied in this research.

In Anagnostopoulos, Demerouti, Sykioti, Niakas, and Zis's research study (2015), a study was conducted within graduate medical education. Factors associated with mental health status in medical residents were identified, and participants were recruited by means of inviting all medical residents training at a specific hospital. This research project was advertised via email to internal medicine medical residents and clinical fellows personally known to the researcher. These e-mails were sent via program coordinators as the researcher did not directly access a

roster or database to obtain names or contact information. There were also no major criteria in research participants preferred by the researcher.

The study sample was drawn by a mixed or combination sampling method. The first method utilized was convenience. This method is also known as a nonprobability sample, where the participants are chosen by their convenience and availability to the researcher (Creswell & Creswell, 2018). Although it is not the most desirable sampling method, it is widely used. The second sampling strategy is homogenous. This sampling method focuses, simplifies, reduces, and facilitates group interviewing (Creswell & Creswell, 2018). Instead of maximizing the applicant pool by allowing all medical residency programs and fellowships from this institution to participate in the study, the researcher limited it to one specialty across different training locations.

Participants were also recruited via methods of word-of-mouth. After a study participant was interviewed, they expressed having enjoyed the interview, stating they knew of other qualifying individuals who would also enjoy the interview. The study participants would then forward the study e-mail sent by their program coordinator over to their colleagues. Five participants were recruited in this manner.

Ideally, there would have been two to four medical residents participating in this interview from each hospital site, with no more than twelve research participants total to account for variety. The program directors of the specialty were contacted by the researcher and introduced to the study (See Appendix A and Appendix B). With their participation, residents were made aware of the research study, its purpose and encouraged to participate.

The researcher sent an email to the internal medicine program coordinators across the consortium, (see Appendix H) detailing the nature of the study, and informing them of the

approval previously obtained by the researcher from the program directors. The email contained an invitation to be forwarded to qualifying medical residents and alumni (see Appendix G). As the researcher began to be contacted by potential participants, the participants disseminated the study to their colleagues by word of mouth and referred them. Not all participants had been regularly reading their email from program leadership, but were more responsive to communications from fellow residents, chiefs, and fellows.

Procedures in the Research Study

Protocol for the Research Study

This research study investigated one main research question. This question was what were the experiences of internal medicine medical residents during their instructional switch to remote learning, due to COVID-19? The main question also sought to ask what shared and non-shared experiences, if any, existed between the residents? What were the benefits, if any, and limitations, if any, during this modality shift?

The researcher herself was instrumental in the research study, as the researcher had observed the participants' behaviors and conducted interviews or focus groups. From the institution's GME department, a roster of names was obtained to access the complete internal medicine medical resident population and the clinical fellows who trained in internal medicine during the first half of 2020.

An email platform, Outlook, was then utilized to make initial contact with the sample population and recruit volunteers. As participants would respond to the invitation email sent by their program coordinators or fellow colleagues, the researcher would coordinate a meeting date and time based on participant availability. The researcher then sent meeting invites via Outlook

containing password-required Zoom meeting links, and sent the meeting invites to *private.* A qualitative interview was chosen as it can be conducted via face-to-face, through virtual platforms such as Zoom, verbally via telephone, or through small focus groups. Qualitative interviews are unstructured in nature and primarily contain a short number of open-ended questions aiming to obtain opinions and insights from participants (Creswell & Creswell, 2018).

A focus group was first considered as part of the methodology. However, data collection comprised of virtual modalities due to the ongoing COVID-19 pandemic. A study conducted by Richard et al. (2021) highlighted data that showed that online focus groups could generate idea diversity at a comparable level to in-person focus groups. Nevertheless, the study stated that the diversity in virtual focus groups' findings compared to transition in-person focus groups is limited (Richard et al., 2021).

The interviews were semi-structured, containing demographic, written, and open-ended questions, but the researcher gave the opportunity for the participant to elaborate and provide in-depth insight into their personal experiences. The participants were asked to choose a pseudonym in order to protect their privacy. The participants were requested to select their own pseudonym, provided the name was a Disney, Pixar, Star Wars, or Marvel character. These pseudonyms were individually chosen by participants and may have mirrored their character, quirks, or had some personal significance. However, due to the nature and content of this study, participant-chosen pseudonyms were abbreviated. Interviews were conducted virtually through a virtual platform called Zoom. This interview type was chosen as participants could not be directly observed nor met physically due to CDC social distancing guidelines. The researcher kept a research journal during the interviews as part of the data collection and acted as an observing participant, with the

researcher's role being known to the participants. The research journal provided reflections, observations, and major notes during the interviews.

Validity

Data validity is critical when conducting a research study. The researcher verbalized a distinct phenomenon that is to be studied in a concise manner. The researcher wanted to ensure that the study's theories were both well-supported and well-grounded. The researcher made sure that as the interviewer, they did not influence the descriptions of the interviewees, thus making them an untrue reflection of the phenomena being studied. Finally, the researcher wanted to convey an understanding of some of the phenomenological tenets. As the conducted study was a phenomenology, procedures recommended by Van Manen were employed (Creswell & Poth, 2018). This approach required the interviewer to ask several questions regarding my study. An example was to ask if the study is based on legitimate primary literature instead of relying on secondary sources. To evaluate and appraise the study, the researcher employed heuristic questioning. The researcher ensured the study contained rich experiential material and interpretive depth.

Reliability

Data reliability is also vital in research. Reliability in qualitative research studies is seen as the stability of responses within multiple coders of data sets as part of the analysis process. Therefore, the researcher employed intercoder agreement and utilized multiple coders to analyze the transcript data (Creswell & Poth, 2018). The researcher developed a preliminary code list. In addition, a common platform for coding, Dedoose, was used.

Data Collection of the Research Study

To collect the data, the research participants experienced semi-structured interviews ranging between 60-90 minutes to allow time for them to share their thoughts, perceptions, and experiences in a cohesive manner. Interviewing the participants was best suited through a phenomenological approach to find common themes among all participants (Creswell & Poth, 2018). Interviews were conducted in a neutral virtual space, Zoom, and when the participant's schedule allowed. Interviews were also audio or visually recorded to later be transcribed after obtaining the participants' consent. The data was transcribed utilizing transcription software, but the transcription was further reviewed. The researcher reviewed the transcription manually to revise and correct any errors, ensuring accuracy.

Activity Data Management

The researcher first began the interview with the explanation of research and identification of a pseudonym, as selected by the participant. The researcher utilized a research journal through a password-protected notebook on Microsoft OneNote through an Apple iPad to serve as field notes. These notes recorded both descriptive and reflective notes, to include any thoughts, feelings, or procedures during the data collection process.

The descriptive notes pertained to participant behavior and the physical settings were the participants attended from, while reflective notes included points of clarification, insights, possible analytical categories, and the researcher's frame of mind. Data analysis includes written analytic memos about narrative and visual data. This serves the purpose of journaling and documenting reflections on the coding process (Saldaña, 2016).

One page was reserved per interview participant, listing the interview questions. The researcher took thorough hand-written notes of participant responses during the interview, organized by interview question. The researcher then typed the hand-written notes, highlighting important information, such as unique quotes, feelings, and impactful statements. Some information was moved to the corresponding interview question, as participants may have answered one question while unintentionally answering another. At the bottom of each page, from each interview, the researcher wrote interview observations and a reflection of the overall interview experience.

Following the interview process, relevant documents such as the video files, audio files, caption files, and transcripts provided by Zoom were filed. The Zoom transcripts were then corrected while the researcher watched and listened to the interviews. The exact language was utilized in the transcriptions to include notes of nonverbal sounds such as pauses, sighs, and interruptions. Each interview and the corresponding notes and pertinent documents were saved as separate files within a larger file. They were uploaded to a password-protected Microsoft OneDrive account in accordance with the IRB 5-year storage requirements.

Data Analysis

Analyzing qualitative data is traditionally conducted in five steps. The first step in data analysis is to manage and organize the data, which consists of file preparation, ensuring the creation of secure file storage, and selecting the analysis mode, such as software utilization (Creswell & Poth, 2018). The second step is to read and record emergent ideas such as note-taking while reading, sketches of reflective thinking, or field note summarization which can all lead to code development.

The third step of data analysis in quantitative research is to describe and classify codes into themes. This step includes working with words, identifying codes by listing code categories and descriptions, applying codes by assigning the codes into units of texts or recordings, and reducing codes to themes, which finalizes the codebook (Creswell & Poth, 2018). The fourth step is to develop and assess interpretations, such as relating categories and themes to lead to contextual understandings, as well as relating categories and themes to the analytic framework found in the literature leading to further theories and propositions (Creswell & Poth, 2018). The fifth and final step is to represent and visualize the data. To do this, the researcher created a point of view utilizing matrices, models, and trees as well as displaying and reporting the data through an account of the research findings (Creswell & Poth, 2018).

The interviews were transcribed by Zoom. The researcher corrected any mistakes from the Zoom transcripts by listening to the interviews again. To code the data, the researcher utilized a software program called Dedoose after first manually coding. This software is a web-based application developed by academics from UCLA (Dedoose, n.d.). The application allows the user to organize and analyze research data (Dedoose, n.d.).

To analyze the interview transcripts, Colaizzi's phenomenological analysis method was used (Colaizzi, 1978). Utilizing this method, each interview transcript was read and reread several times to get a general sense of the data. Important phrases, statements, and quotes within the interview transcripts that pertain to the participants' learning experiences in their training during COVID-19 were then highlighted. After reviewing the highlighted statements, the researcher then formulated meanings out of them (Creswell & Creswell, 2018).

The accumulated meanings were then clustered into themes as themes emerge from the data (Rubin & Rubin, 2005). Using this data, the researcher created a thorough table listing the

data codes to assist in creating a phenomenon description and to provide a visual for the study's readers (see Appendix D). After having a clear analysis of the data through themes and descriptions, the researcher approached the participants to validate the findings (Creswell & Creswell, 2018). In the event that new data were to emerge, it would be included in the final data description.

Colaizzi's phenomenological analysis method comprises of seven steps: 1) familiarization, 2) identifying significant statements, 3) formulating meanings, 4) clustering themes, 5) developing an exhaustive description, 6) producing the fundamental structure, and 7) seeking verification of the fundamental structure (Morrow et al., 2015). In the familiarization step, the researcher read through participants' accounts repeatedly to get acquainted with the data. The second step required the researcher to identify every statement in the participant accounts that were significant and directly relevant to the investigated phenomena (Morrow et al., 2015). By formulating meanings, the third step, the researcher identified meanings that were relevant to the investigated phenomena that had arisen from consideration of significant statements of the participant accounts.

In the fourth step of Colaizzi's method, the researcher clustered the identified meanings into themes found to be common across the participant accounts (Morrow et al., 2015). The researcher then developed an exhaustive description in the fifth step, which included writing an inclusive and thorough description of the phenomena, and incorporated the themes found in the previous step. The sixth step, producing the fundamental structure, is defined as the researcher condensing a thorough description to a shorter, denser statement that captured essential aspects of the phenomena structure. Finally, the researcher sought verification of the fundamental structure by returning the statements to all the participants and asking whether their experiences

were accurately captured. After acquiring participant feedback, the researcher then returned to the earlier steps and implemented modifications as needed.

An additional analysis method included coding the data through Saldaña's coding manual (2016). The data was then coded both during and after data collection as a tactic of analysis. According to Saldaña (2016), to code is to arrange things in a systematic order by applying and reapplying codes to qualitative data. Codifying is a process that allows data to be divided, grouped, reorganized, and relate data to consolidate meaning. The data would then be synthesized from codes into categories. Saldaña (2016) provides multiple options of coding techniques such as data layout and preliminary jottings. In conclusion, Saldaña's analysis method will be utilized in addition to Colaizzi's phenomenological analysis method. While Colaizzi broadened the steps of analyzing qualitative data, Saldaña thoroughly filled in the broad steps.

Through Saldaña's coding process, the transcripts and research notes were uploaded to Dedoose to confirm coding and theming. Within Dedoose, the researcher assigned eleven descriptors to each participant, to better organize the data. The researcher also assigned 25 codes, correlating codes by research question, interview question, theoretical framework, conceptual model, and emerged themes (see Appendix D). The analysis through Dedoose resulted in 6 code categories, 520 code applications, and 507 individual excerpts.

Generating Codes

According to Saldaña (2016), an analytic code within qualitative research is a phrase or word that symbolically assigns and summative or expressive attribute for visual or language-based data. The data can consist of interview transcriptions, e-mail correspondence, journals, participant observation field notes, etc. This construct, generated by the researcher, translates or symbolizes analytic data.

Coding not only labels, but links data (Saldaña, 2016). A researcher codes in the hopes of finding or constructing patterns within data as well as reflecting profoundly on data meaning. In addition, coding also allows a researcher to develop themes, concepts, and categories through data analysis (Saldaña, 2020). The codes were organized into categories, known as a group of similar codes.

The coding process included inductively formulating the codes, subtractively examining each code on its particular meaning, and retroductively reflecting on the given information. Afterward, the researcher abductively explored the possibilities of code similarities and deductively concluded the commonalities of the codes. This synthesis allowed the researcher to derive the categories, such as a category encompassing travel, family, and safety.

The researcher employed multiple cycles of coding, as needed, to better link categories into one another. The first cycle of the coding process ranges from a single word to an entire paragraph. In the second coding cycle, the coded portions can be analytic memos regarding the data and a reconfiguration of the already-coded data (Saldaña, 2016). The researcher pre-coded with manual notes, made preliminary jottings as she formatted the data, made excel spreadsheets to organize data, re-coded as the first cycle, and employed second cycle coding to refine further and conceptualize the data. For example, “travel difficulties” created a new category, “family challenges,” relating to travel.

The researcher also utilized a generic coding method, as designed by Saldaña (2016). During the first coding cycle, the researcher used attribute coding for the data as a management technique. Attribute coding notates basic descriptive information, including a time frame, data format, and participant demographics (Saldaña, 2020). Structural or holistic coding was then added to all the data as a general overview. Structural coding, relevant for any qualitative study,

especially with multiple participants, plays the role of an indexing device. This coding allowed the researcher to quickly access relevant data to further examine the differences and commonalities in similar segments (Saldaña, 2016). The third coding in the first cycle was descriptive coding, appropriate to field notes as a detailed inventory of its contents. Descriptive coding labels data to summarize the primary topic of a qualitative data passage through a word or phrase (Saldaña, 2020).

The final coding methods in the first coding cycle included in vivo and values coding, as applicable. Both coding techniques were applied to the interview transcripts as a way for the researcher to attune herself to the participants' actions and perspectives. In vivo coding, also known as "indigenous" coding or "verbatim coding," is creating codes for words or terms utilized by the participants themselves (Saldaña, 2016). The terms are indigenous to a particular culture or subculture, such as "didactics" or "chief residency." Values coding refers to applying codes to data reflecting a participant's beliefs, values, and attitudes that represent their worldview and perspectives, such as experiencing a lack of respect from hospital staff (Saldaña, 2020).

The second coding cycle methods consisted of eclectic coding and pattern coding. Eclectic coding, which combines multiple first cycle coding methods, was utilized to refine the first coding cycle choices. Pattern coding was utilized to categorize coded data as an initial analytical strategy. Pattern coding meta codes by grouping first cycle code summaries to identify emergent themes or explanations (Saldaña, 2016). This coding type is appropriate for developing significant themes from the data, searching for explanations in the data, and condensing substantial amounts of data into smaller units (Saldaña, 2020).

The researcher also implemented analytic memos. Analytical memo writing, comparable to researcher journal entries, is meant to document reflections during the study (Saldaña, 2016). Analytical memos included a descriptive summary of the data, what the researcher found intriguing or surprising, the participants' actions, and how the researcher personally related to the participants or the studied phenomenon. In addition, these memos assisted the researcher in her coding choices, any problems with the study, tentative answers to the study's research questions, possible future directions for the study, possible networks among the data, and finding emergent patterns, themes, categories, and concepts.

Coding Themes

According to Saldaña (2020), an analytic theme is a sentence or phrase identifying and organizing what a group of repeating ideas means. A theme is the outcome of analytical reflection, categorization, and coding. Theming data is most appropriate for phenomenological studies and applies to interviews compared to researcher field notes alone (Saldaña, 2016). Themes were identified through the coding process and through memo writing about the themes relating to participant experiences. Furthermore, the researcher generated theoretical constructs or clusters of related themes. To conduct metasummary and metasynthesis, approaches the compare and synthesize key findings, the researcher extracted thematic statements and abstracted participant statements for comparison (Saldaña, 2016). Through these methods, the researcher was able to make meaning of the participants' experiences in a manner that aided in answering the overall research objectives.

Data Trustworthiness

Any well-done research requires analysis to ensure the data's trustworthiness. Data trustworthiness proves to the audience that the data is both valid and reliable (Elo et al., 2014). The first step to conducting trustworthiness of this study was to conduct member checking. After each interview was conducted, the emerging findings were checked with the participant, allowing the researcher to summarize the interview while highlighting key themes and statements (Creswell & Poth, 2018). It also allowed confirmation from participants regarding the accuracy of the captured message or the opportunity to correct and rephrase their statement.

The second step was to maintain good records of how data was collected. Leaving an audit trail demonstrated thoroughness as a researcher (Creswell & Poth, 2018). The researcher had a research notebook where all steps taken within the study were documented. Thorough notes and records on the meta-data of each step were conducted.

A supplemental measurement of trustworthiness was the utilization of tables throughout the research. Tables can increase transparency about analysis, data collection, and findings in qualitative research (Cloutier & Ravasi, 2021). They serve a multipurpose of organizing, displaying, and analyzing research data. Therefore, the use of tables ensures and reassures the reader of the trustworthiness of the research process and the robustness of data that backs drawn conclusions (Cloutier & Ravasi, 2021).

Finally, the last way to ensure data trustworthiness was to have the committee's methodologist check the study's analysis. This external audit would limit researcher bias and would allow objectivity to be maintained (Elo et al., 2014). The methodologist also checked the emerging findings. The review provided a second opinion on the emerging findings, should the researcher be incorrect in their assumptions of theme development (Creswell & Poth, 2018). The

committee methodologist reread the interview transcripts as well and read the researcher's notes which ensured arrival at the same conclusion.

Positionality

While conducting research, researchers must consider their own positionality, assumptions, and biases in selection and perception. Positionality refers to the researcher's status and influence in relation to study participants, personal identity, and the effects these factors may have on study participants and the data collection process (Lapan et al., 2012). The researcher's positionality may have influenced the data collection. The researcher is a Puerto Rican female, demographically, but is also a stranger to the healthcare field. The researcher is not a medical resident nor a medical doctor. In addition, the researcher is a licensed mental health counselor and licensed marriage and family therapist. However, the researcher, as explained in the limitations section of this study, was previously known to the researchers. This may have contributed to a higher participant rate and may lead to challenges in duplication of the study.

The researcher handled positionality by maintaining objectivity throughout the data collection process. After each interview, the researcher reflected and noted any observations and identified biases. The researcher practiced viewing the study from an objective and empathic lens. This lens may have positively affected the data collection process, helping the researcher understand the experience in a deeper manner. The researcher also tried to allot equal mention and quotes from each study participant, so as not to privilege certain voices over others. Participants were mentioned and quoted based on their responses to the interview questions, as some participants responded more thoroughly than others, resulting in longer interview times. Therefore, participant mentions range from 23 times to 49 times. Additionally, the theoretical

framework and conceptual model allowed the researcher to continue shaping the data collection to the research question and remote learning.

Summary of Chapter Three

This chapter restated the purpose of this research study and presented the research questions. The participants were chosen by homogenous and convenience sampling of internal medicine residency programs at one academic institution in Florida. The selection of the participant sample from the target population was discussed. In addition, the reliability and validity of the utilized instrument were presented. The data collection procedures were also discussed in this chapter. Finally, the methods of data analysis were presented. The results of the data analysis will be presented in the following chapter.

CHAPTER 4: FINDINGS

Introduction

This study investigated the lived experiences of internal medicine medical residents within one college of medicine in Central Florida regarding the transition from face-to-face to remote learning due to the COVID-19 pandemic. The purpose of this study was achieved by interviewing participants and exploring their personal experiences and including any benefits or challenges of their transition in learning modalities. This chapter presents the data analysis findings for the main stated research question and its three sub-questions.

Participant Demographics

Internal medicine medical residents and qualifying alumni from this Florida public institution's medical school were invited to participate through their program coordinators. Thirteen subjects responded and indicated interest. However, for this study, 11 participants were recruited as two individuals who verbalized interest were not able to participate due to scheduling conflicts. The eleven study participants represented three hospital sites within the institution. A wide array of backgrounds included eight distinct nationalities: American (18%), Colombian (9%), Cuban (9%), Egyptian (11%), Kenyan (9%), Pakistani (11%), Puerto Rican (9%), and Venezuelan (9%; Table 1).

Table 1:

Overview of participant demographics

Pseudonym in this Paper	Participant-Chosen Pseudonym	Current Age	Age when Began Program	Nationality	Gender	Current Placement
WS	Wanda/Scarlet Witch	29	24	Colombia	female	1st-year Rheumatology fellow
DD	Donald Duck	28	25	Pakistan	female	Internal Medicine chief resident
WE	Wall-E	36	32	Puerto Rico	female	Hospitalist
MK	Moon Knight	34	32	Kenya	male	PGY-3 graduating to become a hospitalist
R	Rapunzel	29	25	Cuba	female	1st-year Cardiology fellow
N	Nemo	32	28	United States, mixed white & black	male	PGY-3 graduating to attend a Nephrology fellowship and then Critical Care fellowship
Y	Yoda	30	27	Pakistan	male	Academic hospitalist
M	Moana	31	29	Egypt	female	PGY-3 graduating to attend Endocrinology fellowship
S	Simba	31	29	Egypt	male	PGY-3 graduating to attend Cardiology fellowship
SL	Star-Lord	29	26	United States, mixed white & black	female	PGY-3 graduating to attend Infectious Disease fellowship
T	Thor	32	28	Venezuela	male	1st year Critical Care fellow

Of the 11 participants, 4 (36%) were from the internal medicine residency program at hospital site 1, 4 (36%) were from hospital site 2, and 3 (27%) were from hospital site 3 (Figure

1). There was a distribution among genders across the multiple hospital sites. Of the participants in hospital site 1, two were female, and two were male. Hospital site 2 had three female participants and one male participant, while hospital site 3 had one female participant and two males.

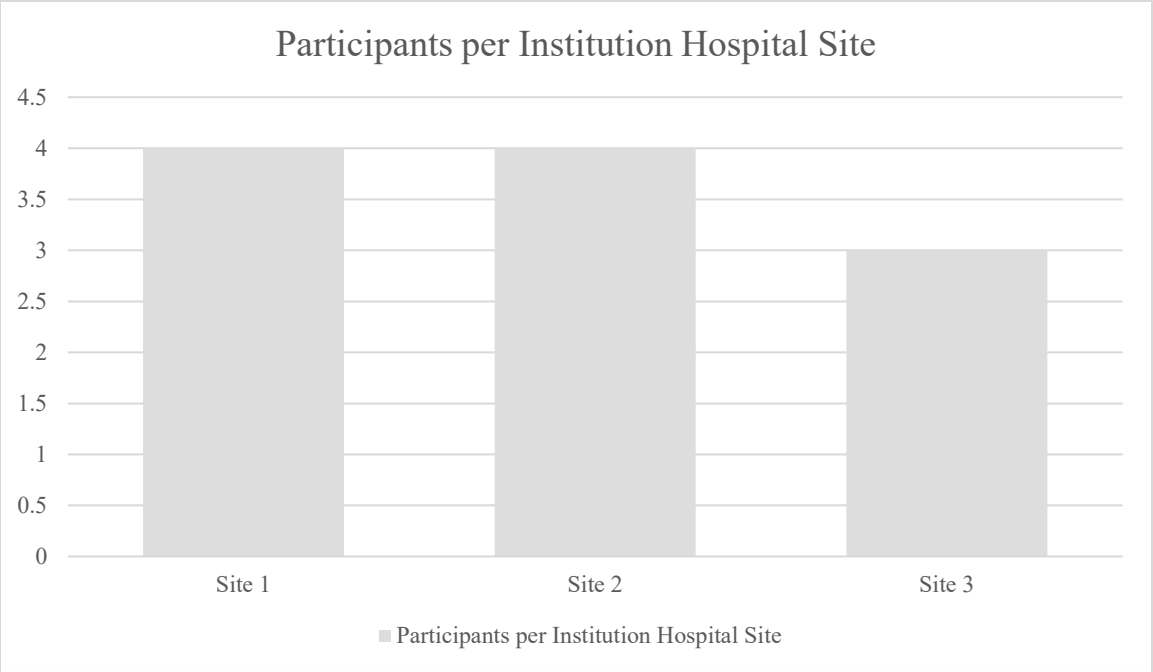

Figure 1: Participants per Institution Hospital Site

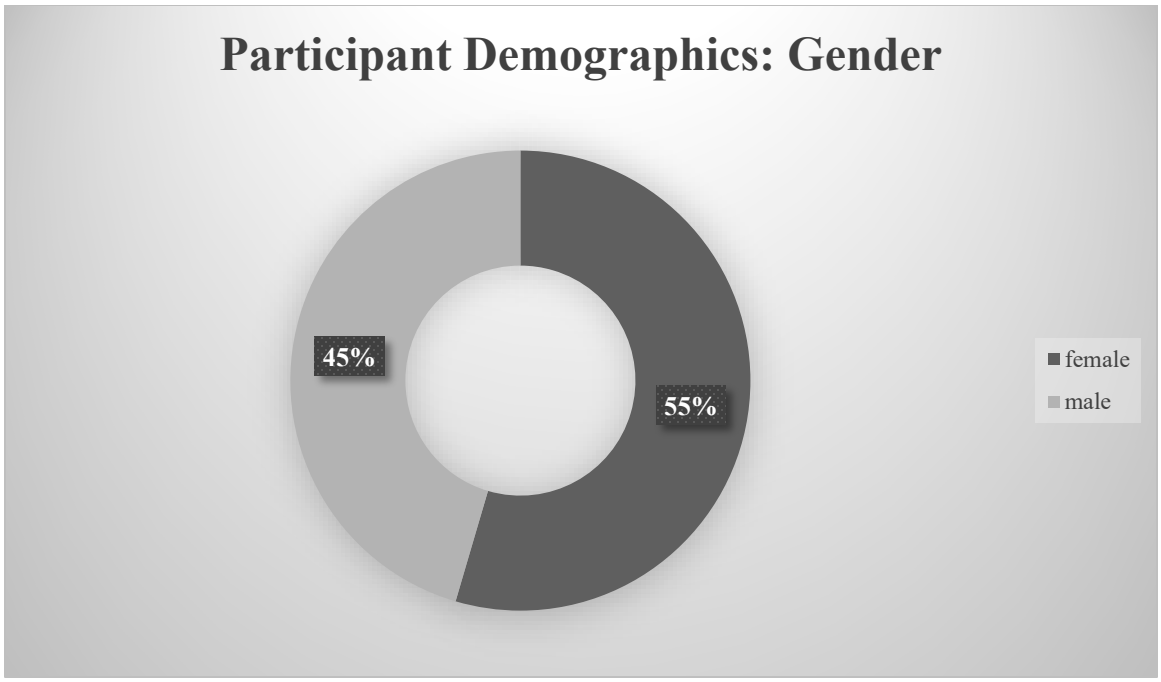

Figure 2: Participant Demographics, Gender

The participants' current ages ranged from their late twenties to mid-thirties, however, participants were in their mid-twenties to early thirties when beginning their residency programs. Of the 11 participants, 6 (55%) identified as female, and 5 (45%) identified as male (Figure 2). During the onset of COVID-19, 5 (45%) were in their first year of residency (PGY1), 5 (45%) were in their second year of residency (PGY2), and 1 (9%) was a senior resident (PGY3) (Figure 3). None of the participants were chief residents as of March 2020. However, the senior resident would become a chief resident in July 2020 and had begun to prepare by initiating administrative duties at the March 2020 onset.

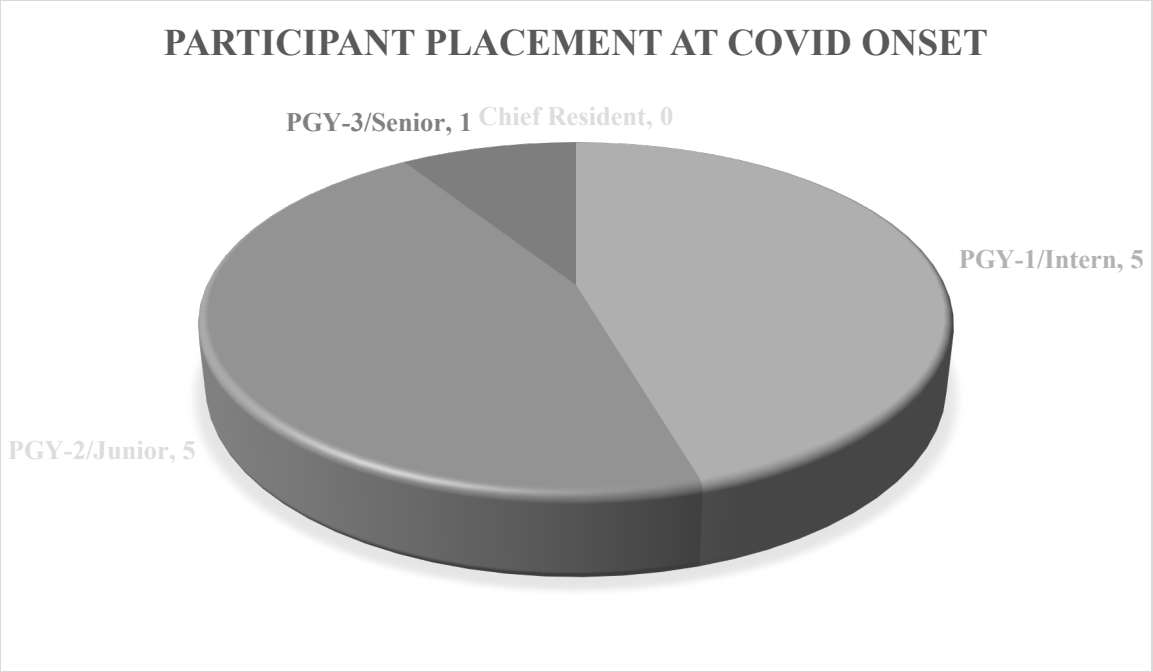

Figure 3: Participant Placement at COVID Onset

Many of the participants' general backgrounds differed. Two of the participants are a married couple. One participant is currently a chief resident, two are hospitalists, and three are clinical fellows. Eight out of the eleven participants arrived in the United States as adults to attend their medical residencies. Moving to the United States meant these participants had to navigate finding housing, buying a car, obtaining a driver's license, and securing a bank account, often without having any family in the area for support or guidance, all while beginning their residency training.

Four (36%) participants completed their USMLE board exams before officially moving to the United States. Two (18%) participants explained their career choice while explaining their personal backgrounds. One participant enjoyed talking to and taking care of others and felt internal medicine included detective work that made them think and solve puzzles. The other participant enjoyed science, and although while in their undergraduate program they did not yet

comprehend what it was to become a doctor, they chose to study biology and pursue a pre-medicine concentration with friends.

One participant initially attended a Transitional Year residency program with the intention of transferring into Physical Medicine and Rehabilitation before realizing they preferred the "fast-paced lifestyle" provided by Critical Care. This fellowship is primarily sought out after attending either an Emergency Medicine or Internal Medicine residency program. One participant transferred into their current internal medicine program from another institution out-of-state as a PGY2 (second-year resident). Nemo (known as Participant N) chose his pseudonym because they "run around lost, making a way, much like the Pixar clown fish."

Research Question

This study aimed to answer: What were the experiences of internal medicine residents during their instructional switch to remote learning due to COVID-19? Within the research question, the researcher also sought to answer what shared and non-shared experiences, if any, existed between the residents? What were the benefits, if any, of remote learning, compared to face-to-face instruction? What were the observed limitations, if any, of remote learning, compared to face-to-face instruction? The data is organized by each research sub-question.

Shared Experiences

Most shared experiences are discussed later in the "themes" section. However, the first shared experience that emerged was why they chose their residency programs. While five (45%) of the participants decided to rank their residency programs high on their match list due to already having family in the area or being geographically close to Central Florida, most also

chose their programs due to their family feel. Participant Y mentioned, “The program and its director had a positive reputation. All the residents appeared happy.” Participant WE stated, “The program was friendly, attentive, a nice place. They were personable; it felt like home and had an aspect of family.” Participant R enjoyed their program being “family-oriented,” Participant DD appreciated how their program felt understanding of the foreign resident experience, and Participant S liked their would-be leadership and colleagues. Finally, Participant WS recalled their initial applicant interview, “We were a big family. During my interview, I don’t remember what the interviewers asked me, but I remembered the family feel. The program always felt like family.”

Other shared experiences pertained to the initial perceptions of the COVID-19 pandemic. The consensus of the participants was feeling puzzled and perplexed because of the changes in both healthcare and education. As Participant WS explained, “Why are we reacting this way? COVID is like the regular flu; why are we overreacting? Then I realized how bad it was.” Participant N mentioned asking why the Critical Care physicians had begun to utilize masks, to which he was informed, “You don’t think COVID is coming?” Participant DD also felt annoyed by the usage of masks while the program director prepared the residents for the incoming cases. The program director would question Participant DD, “What will you do, how will you respond, if it comes?” As a result, she felt the “pandemic was insane” as each variant surged. In fact, four (36%) participants disclosed having gotten infected with COVID during their training.

For three (27%) participants, their initial time off elective coursework due to the shutdown felt like a vacation. According to Participant N, “I was assigned to the ICU in March and April 2020. But for the most part, I considered March to have been a vacation.” Participant SL had a similar experience, “We would work five days on, five days off. I viewed those five

days off as if they were vacations." Although Participant WS had scheduled time off during March, "I spent my vacation time at home, but it felt like the entire month we were locked indoors was a vacation."

Another shared experience raised by two (18%) participants related to the general attitudes toward medical residents. Residents are a vital part of the healthcare system, but may be overutilized. As Participant SW described, "Wellness must be emphasized as a whole, but hospitals are becoming overdependent on residents." The dependence on medical residents seems on par with the fact that there is a shortage of physicians opting for primary care, such as internal medicine, compared to higher-paying specialties (Linville & Bates, 2017). Participant N also felt residents are taken advantage of by the healthcare system, detailing:

> At this hospital, I've never been to a hospital where residents do, like, so much in the hospital. But then it's the, it's a little bit punitive sometimes the culture here, is, it's a lot of like reporting, like with incident reports and even respect with communication with nursing staff and other people calling us by our first names in a professional setting and other things. Some people have trouble in all settings. But there is so much pushback. Residents are blamed. Resident may develop a plan and a nurse may not want to execute the plan. I think that all of that impacts our learning more than I think we want to admit.

Although more shared experiences pertain to travel difficulties and family challenges, the participants shared experiences within and outside of the study's research question. These shared experiences appear to have contributed to their overall learning experience in their residency programs.

Travel Difficulties

A shared experience by most participants dealt with travel difficulties brought on by COVID-19. Participant SW had to cancel their vacation, which was scheduled for the same week as the national shutdown, "I was supposed to go to Europe; I was about to go to Europe during

the week of March 23. I was supposed to go to Italy, and then things got canceled." Participant N also canceled their vacation, although they traveled internationally every six months, stating:

> In May of the year before, I had bought tickets for me and my significant other to go to Tokyo… …We were going to go to Tokyo in April 2020 and yea, that got canceled, low and behold, so I missed out on that seven-day trip.

In addition to canceled vacations, participants encountered travel difficulties due to both travel restrictions and immigration delays. According to Participant DD:

> There have been travel restrictions, so I have not been to Pakistan in three years. Because of the J-1 visa, COVID complicated the already complicated process. It's scary. I didn't know. No plans to go to Pakistan in the future because of the J-1 visa revocation risk. At the US embassy in Pakistan, their waiting list for an interview is up to one year. With my son being a US citizen, it's risky.

Participant M experienced something similar, "The issue is that some visas would expire and you couldn't get an appointment due to the wait time in order to get back into the country." Participant R could not travel to the Dominican Republic, "I couldn't see my family because of travel restrictions."

Family Challenges

Moreover, participants not only experienced issues regarding travel, but also family challenges as well. Eight (73%) participants worried about their families back home. These concerns included worries about infecting family, the health of their families, and not being able to see family. This was something experienced by Participant WE, who proclaimed:

> I was not being able to see my family. Just that whole fear of boarding a plane to fly home to Puerto Rico. And then having the concern of maybe being infected, being asymptomatic, carrying the virus and maybe infecting like my mom and my grandma, who are both technically elderly and at risk. I don't think I could have lived with the fact that, you know, just getting them sick and something happening to them, because of me.

Participant M and Participant S both spent approximately 18 months without seeing their family, as the majority of their families lived abroad. Participant WS worried for her family, too, stating:

> …Because, you know, things over there were bad, but I, my family – everything shifted online very quickly so everybody was working from home, but I was always worried about my family in Colombia, and also for my family in Ecuador.

Although Participant N did not have family abroad and lived a few hours away, they worried about family:

> It was scary for me still. My family was not here so I didn't have to expose them. But I was in the ICU in May, as my family and I got COVID when they visited. And they probably took it back with them and infected others.

Participant MK's perspective was different, stating:

> Getting home was scary for many, scared to spread COVID around. One would take off their clothes immediately after getting home. I don't have a family, but having someone to go to after having a traumatic day, and getting a hug, you couldn't do that before sanitizing.

Participant MK's family challenges included having family members contracting COVID in Kenya while the participant worried from the US. They were responsible for communicating with the doctors of loved ones:

> I was the doctor speaking to family members, but then I was the family member talking to the doctor taking care of their loved one. I saw both sides of the spectrum. It made me a better person and a better doctor.

Family challenges and travel difficulties contributed to the remote learning experience, as added familial stress is cited in the literature to have impacted learning during the pandemic.

Nonshared Experiences

Some participants experienced unique and nonshared moments in comparison to others. For example, Participant N is unique in that he brings the perspective of medical training and learning through a pandemic from two different states, hospitals, and residency programs. The

participant began pandemic training in a conservative town where they shunned wearing masks but had structured learning. They then switched to a different program that provided a larger hospital, but unstructured learning. He lived through two different experiences as a transfer resident who began at the institution during the beginning of his second year in training.

In North Carolina, before transferring to the studied institution, Participant N spent time in the Critical Care unit. Their town was the last in the state to get a COVID case. Treatment for COVID, as explained by Participant N, is either supportive care or to slow down transmission. In the small hospital, they could not provide satisfactory treatment, such as no proning protocol, ARDS, or no ventilator management. Mask-wearing created significant issues in the hospital. Physicians and staff caught wearing masks were reported to hospital leadership. The participant stated, “It's for my safety to wear it,” when questioned by leadership. The hospital then sent an e-mail to not wear masks because it was scaring patients. Within three weeks, masks were required for all.

Participant DD experienced imposter syndrome, a phenomenon not identified by any other participant in this study. She stated, “I felt like a fish out of water,” while adjusting to her residency program before the pandemic. Feeling like an imposter resident was the opposite sentiment of Participant Y. As Participant Y explained, he was, “the weakest medical study in medical school. At that point, in medical school, it was just ‘paper.’” However, his confidence arose during residency training.

Additionally, Participant DD experienced other moments that fellow participants did not share. During the latter half of her third year of internal medicine residency, she was pregnant and was infected by COVID during her pregnancy. Although vaccines were available, there was not enough research regarding vaccination safety for pregnant women. Participant DD also

experienced the Alpha surge as a resident, the Delta variant as a chief, and was on maternity leave during the Omicron variant.

Participant DD was the only participant to articulate feelings of resentment toward patients. During the Delta surge, as she explained, residents experienced compassion fatigue toward unvaccinated and intubated patients. There was a lot of frustration and anger, thinking "You did this to yourself" regarding the patients. The participant recalled a patient with cancer who had an attitude of 'COVID is a joke, not that bad' along with their wife. Participant DD wanted to take them to the ICU ward to change their mind. She recalled one physician who was strongly against the vaccine, threatening to quit employment. He, his wife, and daughter contracted COVID, and the daughter almost required intubation:

> …So it makes me think of that I remember in terms of like my education and learning liking, I still have to learn, you know you know my patient care it didn't really change, the only needs changed I did notice and I saw a lot of residents during the Delta surge was that was the worst of the worst of… what was the word for it? Compassion fatigue, I think? Especially towards unvaccinated patients who are coming with with COVID and then were getting intubated and sick. Like a lot of residents were just like what we've had in those people they use a lot of that frustration and anger towards those patients like, 'Oh, you did this to yourself,' that kind of… So like we saw a lot of that. And that was during the Delta surge there was nothing- there was no guilt, there was no anger there. But when the Delta happened, people were, there was a lot of- a lot of physicians were very frustrated and tired, you know that, 'if only they were vaccinated if only they were vaccinated'. that was that sentiment…
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> Definitely, most definitely like yeah because even though the vaccine wasn't preventing infection, it was definitely preventing people, you know, from getting severe disease. So if people were coming in, only in, and even then they were still like they would come in sick and they were still like the family members will say like, 'yeah we're not getting the vaccine.' I had a patient who had cancer. And he was telling me, like his wife was telling me, like, 'Oh this COVID, this COVID is a joke. It's a lie, it's not that bad, you know.' Like, why don't you and I take a walk to the ICU and I'll show you! …
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> **…**Yeah then doing the- actually one of our physicians was very strongly very strongly against the vaccine. Like he was like, 'if you force me to get it, I will leave the hospital,' like that much. And then he got COVID, his wife got COVID, and his daughter got COVID. His daughter came very close to being intubated and so we were all we were like. All right now, what do you guys think?

Other nonshared experiences pertained to virtual fellowship program interviews during senior year of residency. Participant WS, for example, noticed that no one utilized their cameras while interviewing through Zoom. As she explained, “It was interesting to not have cameras, except for the presented. But in my residency program, they were militant about cameras.” Participant SL, on the other hand, interviewed for 18 different Infectious Disease fellowship programs. According to her, one benefit of virtual interviews was the cost-effectiveness of not traveling to various programs for in-person interviews. In addition, it allowed for more interviews, as programs only allotted limited leave time for travel and interviews. She narrated the difference between in-person residency interviews in comparison to virtual interviews, where cameras were on while on Zoom, but no one interacted or made small talk:

> It was like, if you *did* turn your camera on, it was like “why is your camera on?” So I don't know if I've done so many like for fellowship interviews. Everything was virtual so I ended up doing a lot of interviews. Thankfully infectious disease is not competitive. So with these interviews, like you have to have your camera on. You know, you're interviewing, people want to be- So you would join this zoom group or whatever, and people have their camera off and you’d be like “oh am I gonna be alone with my camera on?” But then, at a certain point, everyone would turn their cameras on. But they would give you these breaks where you'd like literally just turn your camera off for five to 10 minutes- people be like “Oh, you can turn your camera off now and take a break.” And I'm like “I guess I can't take a break with my camera on.” You know, it'd be weird if I'm sitting here, drinking water and people are watching me but we're not interacting. You're just in like a a chat room because they put you in like kind of like waiting rooms like if you're standing in a lobby. I'm like ‘it’s so weird virtually’ but in person, if I was standing in a room with these people, I would try to have a conversation with them. I'm, you know, kind of extroverted. And so you make small talk and you're like “hey where are you from? You know we might end up in this program together!”
>
> …I know for medical school that when I had my interviews, you would be there with a group of people in person, and so, of course, people would just talk and they're like “what did you score on board?” and I'm like “no we're not talking about that!” But with the fellowship interviews there was one, and I did 18 interviews, and in one the group of us actually talked like in that break time when we weren't being interviewed. We just were chatting and it was kind of the combination of, I guess, extroverted people that were there that it just kind of happened. I was like “oh wow this is nice”. But other than that if you were not having that one-on-one with the, you know, program director of this fellowship program, cameras were off, and you were muted. And so I didn't really talk. I would see

> several people, I'd see them in multiple interviews. I'm like "oh I've seen that guy like three times now" but have we spoken? You know. So I don't remember what the question was, but I just kind of went on a rant on my personal feelings with virtual interviews.

One nonshared experience pertained to Participant MK's existential worldview. He proclaimed, "Thinking about it, COVID started when I began, and now it's ending as I end my program. It's crazy. At first we were cautious and now we're going back to the norm." A final unique perspective was that of Participant SL's thoughts post-COVID. During the interview, she described a fervor for this educational experience as her final thoughts. She stated:

> If they had told me 'you'll start residency, which is the hardest thing ever, in the middle of a pandemic, would you still do it?' I can't see myself doing anything else. I liked Infectious Disease before the pandemic. Infectious Disease doctors don't get respect, they're seen as poor. As an Infectious Disease doctor, you don't have any extra procedures to generate more income; there is extra training for the same salary as a hospitalist. I can't deal with the stress of someone's life being in my hands. Hopefully, we're just better prepared for pandemics in the future, hopefully.

Although the non-shared experiences were not great in number, they alluded to the individuality of the participants. The participants found common ground in their lived experiences, but still managed to have unique perspectives.

Benefits

Access, Convenience, & Resources

Participants identified several benefits of remote learning due to the COVID-19 pandemic. Benefits included overall convenience, better educational access, resource availability, and networking opportunities. Participant N found with regard to virtual learning, "The introduction of Zoom made it convenient, and people like convenience." Participant T relished, "Remote learning made learning available anytime, anywhere. It was meaningful to be able to access knowledge freely. I would like this availability of knowledge."

Participant SL found remote learning to be convenient, as it was now an accessible option during COVID surges after the onset of the pandemic. Not only was it convenient, it also created more connections and networking opportunities, according to Participant SL. Participant WS enjoyed the fact that one can now view recordings of conferences and lectures. Furthermore, Participant WS expressed:

> It forced me to look for more resources that were previously unutilized. I don't take it for granted now. For example, podcasts, interactive cases from journals, Twitter or social media to showcase specialties. You can see what other programs do. National morning reports where you can ask questions or share your research.

Social resources appear to be value added by the COVID-19 pandemic. According to Almarzoo et al. (2020), Twitter and other social media platforms were utilized in the healthcare industry to disseminate knowledge and allow collaboration on an international scale. Future medical residents may be more apt to pursue social resources to further collaborate with colleagues or pursue additional knowledge.

Added Learning

Four (36%) participants felt as though the remote modality added value to their learning experience. Participant N benefited from the enhanced visual learning opportunities. He explained, "Instructors and faculty developed more in-depth presentations, showing visuals." Participant Y also felt as though remote learning appeased his learning style. According to Participant Y, "I am a visual learner. I could take notes from the PowerPoint on the computer." Learning opportunities also appeared in the form of additional research. For example, Participant SL found it easier to look up new terminology stated in the lectures. Participant MK admitted remote learning allowed more correct answers, stating, "Sometimes one would feel embarrassed during a question, after not knowing an answer, but remotely you could Google the answers." It

appears as though remote learning attributed to better visual learning and an accepted openness to outside research.

Clinic Work

Participants found they could work on patient and clinical matters, multi-tasking through virtual lectures. As Participant M stated, “One could easily put their phone that was on WebEx to the side while doing patient notes, and not pay attention.” Participant R had the same experience. “Since it was Zoom, you could log into Zoom and then resume what you had to do. For example, we could talk to case management while lecture was going on.”

Participant MK multitasked by reviewing charts, “During morning report, I could review a patient's chart while listening to the lecture, so it helped out.” Participant WE found that this period in the pandemic gave her time to miss lecture, get work done, and go home early. She recalled, “It was great. Was not a fan of daily lecture because it took too much time.” Therefore, Participant WE found a benefit of virtual learning to be, “being able to skip case conference to get work completed, instead.”

Comfort

Remote learning provided comfort to at least four (36%) participants due to learning in one’s home environment in comparison to a classroom. “Participant Y affirmed, “Academic half day was a much more relaxing learning environment from home instead of in an uncomfortable chair.” Participant DD expressed similarly, “During academic half day, it was nice to attend in the comfort of one's own home.” In addition to the home environment, comfort was also found within platform utilization. For example, Participant SL explained that Webex became easier to use with practice, as it was utilized every day. Participant T declared feeling uncomfortable in the

traditional brick-and-mortar setting, around classmates, and he voiced the issue of learning styles:

> It seemed stupid to go in a room at a specific time, without anyone around you to just listen and write notes, it should be fine. But all the people in the same room… There are different types of learners, and I don't like people around me.

Distance

Because remote learning eliminated distance from the equation, Participant SL found more flexibility in their schedule to attend virtual fellowship interviews. As she stated, “There is a lot of convenience with virtual learning. You could see lectures and conferences that you would never be able to attend physically.” Participant R agreed that distance was no longer an issue due to remote learning. She explained, “The hybrid modality of instruction is easier for some people. For example, some lecturers lived far, so remote instruction is more convenient. They can avoid traffic, or commuting from their clinic to the hospital and back to the clinic.” The lack of a commute saved time for the participants.

Distractions as Benefits

Some benefits did not pertain to education.. Participant N found these benefits to be convenient, as he stated, "You don't have to worry about being noisy while eating chips or snacks, you can mute yourself." Participant SL was able to work on research projects and could multitask while the lectures were happening. She explained, “It was also easy to get away with not paying attention.” As Participant MK described:

> Academic half day was good because lecture was at home. At first, it was not mandatory to have your camera on in Zoom. You could watch movies. It was great, I loved it. As an intern, you're tired. You got to go home and take a nap with the shift. During morning report, I was able to multitask while the computer was on.

Guest Speakers

Because learning transitioned to remote and online modalities, the world became a smaller place. As Participant WS explained, “Zoom allowed for outside speakers. There were experts from Chicago and previous graduates. It was nice to see them all again and to meet alumni before my time.” Participant DD stated something similar, “We’re able to invite guest speakers from across the nation, including alumni now in fellowships, which was new and enjoyable. It is still done today.”

Participant N felt as though online learning allowed for the continuation of guest lectures. It appeared as though without the opportunity of distance learning, guest speakers would not have been possible. According to Participant SL, “Remote lecture was beneficial as the program could have guest speakers from far away, who otherwise wouldn't have attended.” Participant MK summarized:

> Remote learning was beneficial in that the guest lecturers were from across the country, such as attendings from New York or Miami. If you were interested in a fellowship, it provided networking opportunities at academic half day. The program director lectured and had lecturers from other states, and the PowerPoint format stayed the same.

Wellness

Remote learning provided opportunities for wellness otherwise absent to residents. Participant T voiced, “I found it to be wonderful, because I was self-motivated. I love learning, and learning how to learn better. I could learn on my own time.” Wellness can also incorporate spending time with others to improve one’s wellbeing. This was the case with Participant R; because her boyfriend was also studying through Zoom, they were able to spend more quality time together. Some were able to become healthier as a result of their free time spend on physical activity. While Participant N improved their wellness by running outdoors, Participant WS disclosed:

> … Now people see how remote can help. Had free time. Since I had time on my own, I had time to do things, like study MKSAP… …Zoom got old, although it gave her time for herself. It brought her back to her priorities. Resurfaced and more efficiently so. The freedom that remote learning caused, such as extra free time to study or focus on wellness. I also began to prioritize their needs first as a result. Overall, my health got better.

Improving wellness includes freedom. However, in order to excel in an academic environment with freedom as a component, one must be disciplined.

Challenges

Aside from enjoying the benefits of remote learning, the participants nevertheless experienced challenges as a result of the instruction modality change. According to a study conducted by Serhan (2020), participants had negative experiences utilizing virtual platforms such as Zoom. Their experiences included disadvantages such as technical difficulties, poor educational qualities, and low quality of interaction and instructor feedback (Serhan, 2020). This seems to have been experienced by the participants in this study as well.

Disorganization & Falling Behind

Some participants found the change to remote learning to be chaotic. As Participant S explained, “There was chaos and disorganization. Initially, it was a failure. It wasn’t organized. We didn’t like it.” Participant N complained, there were no structured lectures, and the remote modality worsened the learning experience even more. Participant T also spoke on the disorganization of their program’s curriculum, mentioning, “We didn’t have proper structure, training, or enforcement…”

Because of the curriculum disorganization, there was a fear of falling behind with learning and competency milestones. Participant S expressed, “If you didn’t get what you need out of lectures, you were more responsible for your learning.” Participant M said similarly,

stating that they felt they had to study much more from lectures during their personal time in order to keep up with their learning.

Distractions & Lack of Interest

During lectures, participants experienced many distractions. As Participant WS explained, “An issue was the utilization of cameras helped but became distracting; they had to be on." Although one hospital site had a camera requirement, as Participant MK confirmed, “Now cameras are required to be on,” other hospital sites operated differently. For example, hospital site 3 did not require cameras. According to Participant SL:

> There was a subculture of no cameras during Zoom meetings, lectures, or even fellowship interviews. I was accustomed to a different style, so I easily zoned out as it was very impersonal. I considered myself a good listener and polite in person, in comparison.

Other distractions, as detailed in the benefits section, included family distractions in the home, watching movies during lecture, and attending to clinical work during lecture time. Participants became disinterested. Participant N stated, “...it made residents lazy. You could get on, mute it, and cut the camera off.” This led to a decrease in learning. As Participant M stated, “I wasn’t completely focusing, so I needed more study time.”

Distractions overlapped with a lack of interest in virtual lectures. For example, Participant WS felt that Zoom got old. Because residents would skip attending lecture altogether, attendance began to be taken at hospital site 1, as Participant MK described. At hospital site 2, Participant S expressed, “It was hard getting residents to attend. There was a lack of interest by residents via Zoom. There was a difference sitting in class versus at home in a computer.” Interest even became challenging for those who thoroughly enjoyed lectures pre-COVID.

According to Participant SL, “I always tried to be interactive and attentive. However, with remote learning, I didn't feel the need to be attentive, there was no eye contact.”

Lack of Interaction

Socialization is one of the major aspects of learning. With the transition to remote instruction, the quality and frequency of interactions waned. Participant WS expressed, “It was a challenge not having connections with classmates. Tough.” “There were no interpersonal interactions when sitting at home,” seconded Participant Y. Participant M felt similarly to Participant Y, proclaiming, “…being around people, it was not experienced with remote learning.” Participant SL also preferred learning by instructors teaching in person; she stated, “Remote learning was very impersonal.” Participant MK identified how they felt about the lack of interaction, “There was no socializing within the program. It sucked because you didn't meet with your colleagues.”

The format of instruction did not appear to be interactive, either. While Participant R found it hard to interact, Participant S proclaimed lectures were not interesting nor interactive. Participant N explained he would get bored easily, stating that his attention span was negatively impacted. As Participant N expressed, “It takes away from the 'in-person factor,' no active learning.” Participant M found remote lectures “…challenging in that I liked lectures to be more interactive.”

Participant DD more thoroughly explained, “If didactics were conducted over Zoom, and they were plain lectures, they were difficult to get through. One would fall asleep on the couch because they were so dull.” Participant SL felt remote lectures created a culture of muting, “and having a hard time paying attention. In person, one would be respectful to the lecturer, and would pay attention.”

Lectures could have been more interactive with the inclusion of guest speakers. However, the onset of COVID eliminated guest speakers at hospital site 2. Participant WE explained, "There were no more guest speakers besides occasional gastroenterology distance lectures, or infectious disease, or statistics lectures. During weekly sessions, sometimes the program director would focus on third-years while other faculty focused on interns and second-years." On the contrary, participants at other hospital sites reported the added presence of guest speakers, a new benefit of lecture.

Fear of Speaking Up

One challenge not presented in the literature pertained to a fear of speaking up and advocating or verbalizing experienced difficulties. Participant SL was afraid to interrupt during virtual lectures. As she explained, "I didn't want to interrupt the instructor during virtual lectures; I refrained from asking questions." Participant Y expressed similarly, "It was also hard to ask questions as you would be interrupting Zoom teachings." Participant R felt anxious in raising concerns, stating, "I didn't complain about the lack of engagement. I didn't want to make them [the instructors] feel bad." This could be a long-term detriment for medical residents who may have had questions but felt as though they could not utilize the online modality to solicit feedback.

Technology

Technical difficulties were an issue repeatedly mentioned in the literature. Among the study participants, Participant WS personally struggled with their noon report because she was not very "tech savvy," as she stated. Participant S identified some technology challenges, "Voices on WebEx would cut out a lot. There were initial problems with the system, and setting up

WebEx." In contrast, Participant R shared that the technology was simple, "We all had computers. Just log in, and attend class."

Themes

Themes are phrases that organize and identify the meaning in groups of repeated ideas (Saldaña, 2020). Themes pertain to the analytical outcome of the studied phenomenon. The themes mentioned below were not addressed in the research question. However, they were of particular notice among the majority, if not all, participants. Each hospital site reported vastly different experiences based on resources, support, and organization structure. Nevertheless, several experiences were shared constructs between the group of participants (Table 2).

Table 2:

Qualitative Codes

Code	Categories	Themes	Sample Quotation
• Trauma • Anxiety • Burnout • Social support • Exercise • Chaos • Feelings	• Affected mental health • Quarantine changes • Coping	Mental health	• "A human being is gone." • "In the ICU, patients were by themselves, dying alone. Calling families weighed on you." • "I'm always a positive person. I knew at some point we'd figure it out, which we did, eventually. It was just frustrating."
• Teaching • Webcourse • Instructors • Leadership • Learning curve • Enforcement	• Chief residency experience	Impact of contributions of chiefs as instructors	• "The chiefs worked hard to improve the quality of lectures and providing relevant topics so that people would pay attention. Beforehand, some lecture topics were

Code	Categories	Themes	Sample Quotation
			quite irrelevant to our learning and training.” • “Chiefs did online modules to replace Academic Half Day and used townhall meetings for pandemic updates.”
• Patient interactions • Electives • Rotations • Learning styles • Lectures	• External changes • Patients • Diagnoses • Changes during lecture	Affected learning	• "We lost on-the-job and didactic training. It's missing." • "I missed out on the Heme/Onc elective." • “People don't learn from a Power Point. There should be more ways.”
• Engagement • Technology • Feedback • Curriculum change • Too busy	• Education • Unprepared instructors • Healthcare	Lack of support	• “Many attendings refrained from doing lectures and just recorded their lectures. So then why attend? Why not do it on my own time?" • “Instructors cut out lectures because they had no time to teach. They went from seeing 10 patients to 25.”
• Responsibility • Paying attention • Studying alone	• Self-accountability • Self-motivation	Accountability	• "My learning was more of what I made it." • "Learning falls on you."
• Exposure • Minimization • Sick leave • Feedback • Information distribution • Wellness	• Resources • Program support	Resources & support	• “The program threw the word ‘wellness’ a lot.” • “The program director met with us once every other week to discuss change and what would improve our learning experience.” • “…Everyone knew there is someone to talk to.”

Mental Health

This theme explains the aspects of participant experiences that dealt with their mental health, either in a positive or negative manner. Mental health was a common theme throughout the literature as well. Participants' mental health appeared to have been affected during the COVID-19 pandemic, as described by their experiences during the remote transition. According to Haider et al. (2020), pandemics lead to psychological distress that can culminate in various mental health disorders such as anxiety, depression, or posttraumatic stress syndrome. Medical residents have been known to experience anxiety (Sethi et al., 2020) and fear regarding the uncertainty of personal protective equipment (PPE) availability, personal vulnerability, risking COVID infection, changes concerning social distancing, and concerns over the health of one's family (Kohan et al. 2020). Symptoms of depression presented due to isolation, loss of sleep, routine disruption, grief and loss, and loss of the old "normal" prior to the COVID pandemic (Kohan et al., 2020). Participants in this study expressed a range of feelings and emotions pertaining to their emotional and mental health, (Table 3) alongside some symptoms found in the literature. Table 3 provides a range of verbalized emotions and feelings as identified by participants, allowing the reader to understand the range of experiences the study participants endured.

Table 3:

List of identified feelings and emotions experienced during learning change

Identified Feelings & Emotions						
Adapted	Adjusted	Afraid	Alone	Annoyed	Anxious	Aware
Bored	Burdened	Careful	Cautious	Challenged	Chaotic	Depressed
Desensitized	Discouraged	Disengaged	Drained	Emotional	Empathetic	Exhausted
Fearful	Frustrated	Guilty	Indifferent	Isolated	Lonely	Mentally Taxed
Nonchalant	Overwhelmed	Restless	Sad	Scared	Sensitive	Stressed
Sympathetic	Terrible	Tired	Trapped	Traumatized	Uncertain	

Affected Mental Health

The participants in this study were affected by all the changes and experiences caused by COVID-19. Participant SW mentioned that as chief, they noticed many residents did not have the luxury of focusing on their wellness, and instead suffered mental health issues. Some felt the difference more intensely in the beginning before acclimating, while others began the pandemic adjusting but then struggled afterward. Participant S expressed, “It was depressing in the beginning, but after everyone was supportive.” In contrast, Participant SL experienced differently:

> After a couple of months, the stress of infection wore me down. The lack of social interaction was also stressful. By the end of the summer, I was worn down, uh, July of 2020. At that time, I’d been pulled from electives to go to ICU for an extra week. That’s in addition to my already-scheduled regular ICU time. I was no longer an intern. Everyone got infected with COVID after the July 4th Independence Day BBQs, so the COVID unit was full in the southern part of the country.

Residents felt a decrease in mood. Participant N reported feeling bored and “very alone.” Participant WE felt fear of becoming infected and infecting others as a result. Participant MK also shared a fear of spreading infection, “I was exhausted, from working all the time. Exhausted mentally, emotionally, and physically. Getting home was scary for many, scared to spread COVID around. One would take off their clothes immediately after getting home.”

Participant DD felt anxiety regarding patients, “I mentally prepared to, to interact with COVID patients. Around COVID patients, I felt "creepy-crawly" sensations like I was getting infected by being around it.” She experienced more anxiety past her normal everyday levels of anxiety during night rotations and ICU shifts. Participant DD reported experiencing compassion fatigue and stress. She feared bringing COVID home, stating she cried to her husband numerous times. Participant WS felt anxiety from the uncertainty of the future, stating, “I thought, will the

program be canceled? Will I graduate?" Healthcare workers facing uncertainty (Haider et al., 2020) and learner stress regarding the future of their careers (Rodriguez et al., 2020) were mentioned in the literature.

Trauma

Many experiences were traumatic to the study participants. Participant WS experienced a death in the family. Participant MK witnessed patient deaths, "In the ICU, patients were by themselves, dying alone. Calling families weighed on you." Participant DD encountered death during the COVID experience and found learning to have decreased due to the options of clinical opportunities. She mentioned:

> All ICU patients were COVID-patients. The COVID-19 patients were intubated for weeks at a time. It was depressing. No patients did better even with treatments and medication. During the first day in the ICU, someone coded and died two hours into my shift.

Participant SL reported struggling to compartmentalize her traumatic experiences, unlike her colleagues. She would cry from the deaths she witnessed and the stress in the ICU. She detailed multiple:

> And I remember, there was like one guy went to the BBQ and auntie got COVID, grandpa got COVID, great uncle got COVID. And there were two men in their 70s, were brothers that had been at a barbecue together that had COVID and they were like down the hall from each other, and they were actually able to arrange it so like one of them could go into the other's room and they could talk and that was like a week or so before they both ended up dying. And I was like this is like effed up like what world is this that I'm living in that I'm talking to somebody and now you know being on the night shift and then the next night they're like dying and I'm actively coding them and having to intubate these people and they were so sick and then we had like nothing to offer them. It was like the ICU was already stressful enough without a pandemic going on, and for me, like, transitioning from, you know, being the person asking all the questions to being a person who's supposed to be making decisions. It was so stressful. I wrote about it in my personal statement, because it was a big time of growth for me. But it's like that you're under pressure, so you have to grow, kind of formative growth. And you know ICU got long shifts of 12 to 13 hours, so I would go home, pass out, wake up, drag myself back to work, and like people die and not be able to help them and I learned some valuable lessons. Like there was- it's not my fault that person died, which is something I had kind

> of struggled with as an intern you know struggling with my confidence and my medical knowledge and not knowing 'It's my fault?' so that month I realized like if somebody is going to die, sometimes I cannot do anything about it. And so I was able to kind of compartmentalize- Well, I had to develop that skill because I was like "I can't take this home with me, people are sick and I cannot, I can only do so much and it's not enough." So it was very emotionally and mentally taxing for me, and I remember very distinctly- one of my patients, it was like I had done my very first central line on that patient, and then the next night he coded and he died. I had to call his wife and his family and tell them that he just suddenly died and there's nothing to do is hard. And I felt terrible. I just felt sad, it was very sad, and I think the rest of the shift that was kind of like in a… Like people would look at me and they'd be like "oh wow she looks sad" because I was. And my colleague was like "you can't get sad every time this happens, like you got to kind of shake it off and snap out of it," and I was like "Somebody died, not two hours ago and you're telling me not to be sad about it." And we're very different people and I've always been a very sensitive like empathetic kind of person in tuned with other people's emotions. And he was just like "no it's just another one it doesn't matter to me," and I was like "a human being is gone" and you know you don't, there's millions and billions of people in the world, you only come across so many in your small blink of a lifetime…

Participant SL shared a gruesome yet realistic perspective of the human condition through a medical resident's eyes. Witnessing death is inevitable when pursuing a career in healthcare. However, death as a result of a pandemic appears to have been an adjustment-inducing trauma experienced by participants. This participant also dealt with an existential crisis of respecting and honoring the individuals she lost during her shifts, and grieving their loss, all the while continuing to learn medicine and treat other patients. This seems to have affected their mental health, as apparent by their struggle to compartmentalize the events.

Quarantine Changes

Quarantine changes involved adjusting to life at the onset of COVID, including the national shutdown. Participant Y summarized the change through his statement, "Personally, it was the reality of what was happening." Participant MK explained the sentiment surrounding fear when COVID began, "The COVID now is not the same as then. Hospitals closed. We were locked down. Everything was through Zoom." Participant Y learned new valuable skills, "I had

to teach myself to cook. At the hospital, all residents got free food. At home, it was unrealistic to order food every day." Participant Y also experienced social isolation, stating:

> It definitely affected me, and the effects are lingering still. I don't like staying indoors. I am social; I need to go out. Staying inside for over a year was pretty depressing. It's been a bad year and a half.

Participant N expressed not being used to everything shutting down. They felt bored and very alone, but thought they had dealt with it. He explained:

> I just coped by coping. I didn't notice. My whole life and medical career has been dominated by adjusting. From doing one year in Atlanta, Chicago, Miami, California… always switching." "I didn't really feel it. I'd think, 'it's a thing, go with the flow, put your mask on.

Participant SL indicated she was scared to go out for groceries or to spend time with friends. As a result, she felt isolated, regardless of having a roommate.

> During the pandemic, there was more time to one's self. I remember feeling very scared. I wanted to go out, so I walked around outside as a solution. I felt trapped and restless. There was a party hosted by another residency program at another institution, where 40 residents got infected with COVID. I thought, "Nope, not getting COVID." The situation was depressing, lacked any social outlets.

Coping

Participants' coping methods varied, but all found specific ways to cope. Three participants (27%) mentioned that their programs encouraged residents to reach out to the institution's employee assistance program (EAP) as an outlet to manage mental health. A few residents admitted to utilizing it for mental health counseling.

Participant SL coped by reading, watching TV, and drawing. She bought art supplies to support her hobbies. She also read books, as she could not be social, stating she felt there were zero opportunities for socialization. Participant Y also managed by "…watching a lot of Netflix and YouTube." Participant N resorted to physical activity, "I started running outside since gyms

were closed. I ran four miles per day to get some sunlight. I also maintained hydration."

Participant WS explained the importance of wellness as a coping strategy:

> I noticed as chief, the first month helped me focus on wellness. Others did not have that luxury. Many suffered mental health issues. Wellness must be emphasized as a whole, but hospitals are becoming overdependent on residents. Really need to focus on wellness. This will be tough. What is the price? Will it lead to burnout? How do you see 20 patients in a day? Let's not focus on numbers, on salary, focus on things to be balanced. More focus on, 'I need time off. I saw so many deaths. They saw so many deaths.' Focus on wellness.

Participant SL resorted to improving her mental health. She sought therapy and found the sessions to be helpful. The participant stated treatment helped normalize her feelings during the pandemic. Participant WS coped through several methods:

> Wellness, running. I was already active. Meditations helped with coping. Helped a lot in the beginning. I downloaded Headspace (free for healthcare). Meditation. Initially, it triggered anxiety, but at the end my overall health improved, with diet and nutrition. Lost weight. I don't take health for granted now. Became more mindful. I enjoyed traveling so COVID took a toll. My boyfriend and I work out together. I used to work out, but Orange Theory Fitness was closed. I started running, jogging, doing workouts at home. I bought a Peloton in July 2020. Part of wellness is to stay active. Overall, my health got better. At times I cried, scared that I'd get sent to ICU, scared to handle COVID patients. I'd think, "Hope it's not me."

Social Support

Social support appeared to be conjoined with one's mental health. Participant WE communicated, "Socially, it sucked. There was less interaction, no going out or spending time with people, being a loner." Participant WS communicated with friends and her significant other, "I had a boyfriend. I had support, wasn't alone." Participant T felt similarly, stating, "I coped because I had wonderful family support and by my husband. I didn't feel stressed."

Participant MK also managed by seeking social support, "Everyone copes differently. You get to have people and supportive friends in the medical field. Another way to cope was having relationships with loved ones and people who appreciated the work you were doing."

Participant Y identified support within his program, “Everyone knew there is someone to talk to.” Participant DD expressed how having support from home but distancing support from her family back home affected her:

> I talked a lot about it to my husband, who is my best friend. I cried a lot, I let it out. I did not experience any panic attacks. I didn't pursue medications or sought professional help. I stayed grounded. My parents remained in Pakistan. I didn't tell them about the conditions or that I worked in the ICU. I didn't tell them when I contracted COVID, but my mom figured it out. I kept things from my parents, which I was not used to doing so. I lived with my husband and brother, but distanced the reality from my mom.

Impact of Contributions of Chiefs as Instructors

This theme explains the reoccurrence of chief residents mentioned in participant interviews. Some participants shared their first-hand accounts of instruction through a chief resident lens, post residency. Other participants expressed their observations and gratitude toward the chief residents in their program and their role as administrators during the pandemic. The literature shows that medical residents turn to chief residents for support and guidance throughout their training (Tisdale, Filsoof, & Singhal, 2020). The literature also includes first-hand accounts of chief residents and their experience as junior faculty and program leadership throughout the pandemic.

A part of the participant narratives frequently mentioned pertained to chiefs and their role during the pandemic ordeal. Although the information on chief residents can be found in Chapter 2, according to Julian et al. (2022), a chief resident is not an actual medical resident, and they do not have milestone assessments, formal curriculums, or board certification opportunities. Instead, a chief resident is a junior faculty leader. They are selected during their residency training and begin after their training completion but before any fellowship training or faculty appointment (Julian et al., 2022). Chief residents assume the role for one year. As chiefs, they train medical

residents and medical students and manage their programs to include personal problems, resident conflicts, faculty, and performance issues (Julian et al., 2022). The goal of a chief residency year is to launch a career in leadership, particularly in medical academia.

A commentary by Tisdale et al. (2020) detailed the experiences of the three internal medicine chief residents at Stanford during the onset of COVID. The team of chiefs responded to the pandemic in three phases. The first phase was establishing facts and implementing systems, and the second phase was to refocus on core program values, while the final phase consisted of planning for long-term changes (Tisdale et al., 2020).

A study conducted by Wortmann et al. (1982) examined the chief residency year's job description at the time. A chief resident's time was distributed between administrative tasks (41%), teaching (35%), patient care (21%), and research (3%) activities (Wortmann et al., 1982). Because of the leadership role of the chief residency, administration during the COVID-19 pandemic progressed from just playing a part of the chief experience to the main character of said experience (Tisdale et al., 2020). According to Rakowsky et al. (2020), the role of chief resident has evolved from providing mentorship and diverse teaching to medical residents, to teaching and implementing information that will prepare physicians to practice medicine during crises. Chiefs are now rapidly learning leadership skills.

Chief Residency Experience

Three (27%) participants experienced chief duties since the onset of COVID. As chiefs, they added a valuable perspective to the experiences held by residents. For example, Participant T was an in-training chief, or a third-year senior resident given chief-level administrative duties. As chief, he found weaknesses in leadership instruction, "I was an in-training chief, and I realized people weren't called on to ensure they were paying attention." In hospital site 3, chief

contributions to the virtual curriculum were noticed and appreciated by their fellow residents. Participant SL mentioned, “The chiefs worked hard to improve the quality of lectures and providing relevant topics so that people would pay attention. Beforehand, some lecture topics were quite irrelevant to their learning and training.”

Because chief residents are in charge of administrative duties, the would-be chiefs at hospital site 1 began planning curriculum changes due to canceled electives for the current residents. The online modules created by chief residents, for which they had no experience, essentially replaced their academic half day. Although modules were created, the chiefs realized they were not experts on the subjects they prepared. They sometimes found experts in particular specialties to mentor them, but at the time, they were unaware they could Zoom with experts outside of the institution. They also utilized town hall meetings to disseminate pandemic updates. As Participant SW explained of their role in preparing for the chief residency year:

> So the, the things that happened is that, at that time, when the pandemic started, I was already… I already knew that I was going to be a chief resident, and there were already things on the ward for what to do. You know we were going to be chief residents in July so in March we already were doing stuff. So I remember that there was a meeting that we were talking about what we were going to do with the residents in the meantime. What is going to happen for all those residents that are on electives that- they got canceled! So we decided between the Chiefs and my co-chief; So the incoming chiefs do a certain elective like online, so what I did is that I created a module for rheumatology. So I created a module for rheumatology and that was in my vacation week or something like that, like I just created- I had time to do it at that time. So, I did that. I created a module and then we use different modules like pulmonology, G.I.- like everybody did, like all the Chiefs and I, we did a, we did different ones. So we kind of like… people who went on elective they, they were assigned to different modules and then they did it and then um, every day was a different, a different topic. And then we have it structured differently, so in the morning you do like your own learning and then like at noon, or at one you meet with whoever was the moderator of that, of that module and then you go over questions, go over any questions that they had, or go over a little presentation. So that was, that was across the board for all the lectures.

Participant DD, a current chief resident, had a similar experience to Participant WS. To this participant, the chief year was completely different, as they transitioned from a trainee to

junior faculty, which was a learning curve. According to Participant DD, the chief residents played an integral role in curriculum changes, as encouraged by their program director. As the participant detailed:

> …So it's like it's very different going from the role of a trainee to role of faculty so they being that it's been such, it was a learning curve, but I've actually, like I'm a different person than when I started chief residency and the person I am now. So yeah, overall I can't complain. It's been a very positive experience. And not only like professional development, but even like my own personal development…

The participant dealt with the Delta variant as a chief resident. As chief her job duties included deciding which residents would be sent to cover the ICU, and managing overwhelming authority. She experienced feelings of guilt as a result of assigning residents to COVID-ridden environments. She attended meetings all day, even after hours, to decide if it was necessary to pull residents to COVID wards, and deciding so in a fair and justified way. They stated, "…It was challenging going from resident to chief. I had to make sure the residents weren't overworked." They also had to guide new interns who were not as experienced. During the pandemic, rotations were canceled in medical schools (Kazarian, Conger, & Tracy, 2021). Participant DD explained:

> So when I was done, the Delta variant happened, I was chief. I was just trying chief year. That was insane as well, because we had new brand new interns who are still, like, and their medical education might have been affected by COVID. They hadn't done as many rotations, in as many clinical rotations and as they were supposed to do.

Participant DD was a learner and transitioned to a chief and leader, making changes in curriculum and instruction and rotation schedules. She attended a conference before becoming chief to ensure they completed their tasks and roles. At this conference, teaching and administrative methods were shared. The participant realized they were doing things correctly and were already implementing the conference's standards:

> So I think we've really done the best we can, because we even went to APDIM last year, which is like that chief, it's like a chief resident conference that happens annually. And from what they were talking about, we would kind of like, we're on the same page. They weren't doing anything special that we weren't doing, but one big change we made was dealing with journal club.

The narratives provided by these participants detail the perspectives of chief residents during the pandemic. The chief lens impacted the research positively by answering the research question as both learners who then became instructors. Assuming the roles of educators and administrators, chiefs made curricular changes and provided support to medical residents. The role as chief evolved during this time to include creating a sense of "normalcy" for their programs. Chiefs maintained a sense of community while also addressing the learning environment to safety standards (Rakowsky et al., 2020). The shared experience among residents appears to be one of appreciation for their fellow chiefs.

Affected Learning

This theme explains participant experiences surrounding their learning changes. The curriculum changed within residency programs in several ways. In addition, clinical learning was also affected, as patient interactions and diagnoses exposure changed. Participant WS said it best when she conveyed, "Learning changed a lot during COVID." Even through the changes, Participant N felt, "As residents, we did our best." Differences in learning resulted in multiple influenced areas. As Participant M indicated, "…However, the curriculum was affected." This account appears to reflect the literature, as COVID caused curriculum disruptions throughout the education system (Ong, 2020).

External Changes

Several changes presented themselves in clinic and outside of lecture. Participant SL had to adjust to the national quarantine as well as the "new normal:"

> At first I thought, "What is happening!?" Things were shut down. All of the residents were initially taken out of the ICU. The program created an ICU task force of 10 people, usually residents who had an interest in Critical Care, who would work five days on, and five days off. The hospital wards were also five days on and five days off. We were all so scared. We were stuck at home hoping we didn't get COVID. The daily lunches provided by the program stopped. The program's emergency schedule lasted two months. We transitioned into the "new normal," while new medical information was released to the public. Things relaxed during the summertime.

Participant MK narrated the changes experienced at his hospital site:

> We hadn't seen ARDS (lung disease). Proning and management of COVID was brand new. Practicing medicine with daily-updated data is challenging. We have to keep up with the literature. It's cool I can manage COVID patients well. I'm good with patients, involved in patient care. But I was their doctor, middle man, communicator. And I found it an honor to do so.. …It changed big time. In March 2020, we had 10 patients, we saw them. Then all of a sudden we had to be weary of COVID. We had shields, masks, we had to gown in and gown out. It took a lot of time. Took longer time from seeing all the patients. It impacted the seniors; seeing 10-16 patients, meanwhile gowning in and out, is tough. There was also the stigma and fear of COVID.

Patients & Diagnoses

Participants lost direct treatment of patients and experience in treating a variety of diagnoses. For example, Participant SW pointed out only having learned theory through remote learning. In her opinion, the best way to learn was through direct patient contact, but she was not able to see patients at the onset of COVID. Participant M also explained that intern residents, or first-years, were not allowed to see COVID patients; instead, they only managed them through patient paperwork. Participant DD felt the educational value decreased as the trainees were not given exposure to other diagnoses, such as heart failure or stroke patients.

Participant R experienced the opposite, explaining that residents around the country lost curriculum due to having to cover the ICU wared in areas where the pandemic hit harder. However, she felt her program was not affected in that manner. She stated, “We had COVID patients, but we still had variety in patients and diagnoses.”

Participant S expressed his experience regarding COVID testing and limited education opportunities, such as the absence of procedures:

> We didn't know what to do. We were shooting in the dark. COVID tests took four days to receive results. Our experiences were limited to COVID cases as the hospital now mainly had COVID patients. There was limited education during the pandemic in the hospital. All elective procedures were canceled. Residents were not involved in any procedures. This took us from our learning experience. Attendings were the only ones to interact with COVID patients.

Participant WE’s learning appears similar to other participants in that she treated COVID patients, although it is unclear whether she interacted with multiple diagnoses and disorders to aid in her training:

> COVID-19 patients went to the infectious disease (ED) ward. I had exposure to COVID patients. But initially, residents were told to stay away from COVID patients. As the patient load got high, the attendings first saw them, then seniors (higher-level residents). After everyone got vaccinated, we all had interactions with COVID patients.

Patient interactions

Due to safety standards, several participants expressed completing training without properly communicating with patients, as everyone wore masks, and they could not tell facial expressions. Participant MK explained, “We were constantly interacting with patients, and weren't able to see their facial expressions.” Participant R indicated, “Seeing patients didn't change. We still had to go. It was different in that wearing masks was hard, it was hard to hear, and interactions were impersonal.” Participant DD also stated that not being able to read body

language hindered learning. She affirmed, “Wearing a mask was annoying. And not seeing faces.”

Changes during Lecture

Prior to the pandemic, participants at hospital site 3 would attend in-person lectures with the incentive of being offered free food. Conference rooms were full of trainees. Participant SL experienced livelier interactions during in-person lectures. The COVID-19 pandemic changed that dynamic. Electives were canceled, and chief residents began to teach electives at hospital site 1. Academic Half Day lectures transitioned to Zoom at all three hospital sites. Morning and noon reports also switched to a virtual modality. There was no in-person teaching, apart from rounds, according to Participant Y.

As Participant WS indicated, residents who were on electives at the onset of COVID were assigned to online learning modules, completing a different topic on a daily basis. Residents at hospital site 1 studied alone for half the day and asked questions the other half. However, physical electives are an essential part of training, helping residents explore specialties should they choose to pursue a fellowship program after completing residency training. Participant WS elaborated, "What affected my learning were canceled elective rotations. I was supposed to go to a Rheumatology rotation. I spent a full month at home doing online modules. Academic Half Day (AHD) shifted.”

At hospital site 2, social distancing was initially implemented, according to Participant WE. Case conferences were still held after canceling the first week since the pandemic began. The lectures and conferences then transitioned to Zoom. One resident would present a case, and the program director would write pertinent case notes on the whiteboard. There was a camera pointed at the whiteboard, streaming. The rest of the residents would connect wirelessly and

pitch in on the presenting case study. The program director would call on the residents to ensure participation. Cameras were not required to be on; but residents had to log in for attendance.

Participant T shared his perspective on the changes in his learning, sharing his opinion on the skills needed to excel in remote education:

> COVID changed the in-person learning experience. There was distance; we were masked. It changed to online. The quality of the learning was impacted, as online education was not as good. People were not committed to learning online. Learners were unengaged. You would have to be self-motivated and eager as a learner.

Participant N felt similarly to Participant T regarding the changing learning experience. He stated, "We lost on-the-job and didactic training. It's missing."

Electives & rotations

Because of COVID-19, night hours changed. According to Participant DD, everyone assigned to elective rotations was sent home as electives and rotations were both canceled. Outpatient clinics were closed during the shutdown. Participants were once again pulled from electives during the Delta variant after electives had resumed. Additionally, elective surgeries and Academic Half Day was also canceled at the onset of the pandemic.

Four (36%) participants missed the electives they were originally scheduled for. Rotations were canceled, according to Participant R. The attendings' clinics were unavailable, not because they were closed, but because they didn't allow extra individuals such as learners to minimize infection risk. Participant WE expressed similarly, “In the beginning, we were required to stay home because specialists were closing their offices as all patient interaction was canceled, so there were no rotation options.”

At hospital site 2, the program director required distance learning assignments for some electives, such as dermatology and gastroenterology. Guest speakers were also eliminated with the exception of statistics, gastroenterology, and infectious disease distance lectures. Participant

WE exclaimed she still learned, “It was still work, you were still learning.” Participant M expressed that she had no clinic experience for 3-4 months, stating, “I lost learning experience due to the lack of electives, clinic, and instruction.” The program at hospital site 3 tried to keep residents involved via WebEx, where they were to present and discuss articles daily.

Participants repeatedly expressed losing learning opportunities. Participant R explained her perspective:

> Lectures moved to Zoom, so we lost a lot, I feel like. The instructor would not interact or engage the residents. It became so boring and hard to concentrate. I was learning less. I still read, studied, prepared for the board exam through MKSAP (board prep), but wasn't getting as much from the lectures. All of our instructors still gave us lectures, the same lectures, it was just through Zoom for a while. However, they case reports temporarily stopped, until people were able to spread out in one room, viewing Zoom. It was very chaotic in the beginning. We were figuring out what would be better for everyone so that we wouldn't lose the education part of it, which was a big change because when you're in a different room, it's hard to interact the way we used to before.

Learning styles

Transitioning to remote learning affected participants with different learning styles. For example, Participant WE described herself to be a “hands-on, live, video, person.” She further explained:

> I don't learn passively, with books to read. I need active learning. It's hard for me to sit and read and answer questions." It is double the work. There was also a decrease in patient load, a decrease in interactions, and a decrease in doing things. The learning took a dip.

Similarly, Participant T felt, “People don't learn from a PowerPoint. There should be more ways. One may struggle in remote learning because you have to adapt.” Participant SL was accustomed to a different learning style and easily “zoned out” as the remote lecture was impersonal. They considered themselves a good listener in person but not virtually. Participant M expressed needing in-person instruction. She stated:

> I didn't like it at all, I was one of the first to demand in-person lectures. Remote was not my thing. The program began to require first years to come, making it optional for seniors. However, I wanted to come in person.

Lack of Support

Another theme shared by participants related to a lack of support during the COVID-19 pandemic and the remote learning transition. This theme explains a common experience among participants regarding feeling as though they were not supported by their hospital sites in a clinical manner, nor their programs in an educational manner. When asked if his program provided support, Participant N exclaimed, “No, not that I can think of. No, the challenges were not addressed by the program.” Participant T answered similarly, expressing, “I don't feel challenges were addressed at all.”

Education

Within educational training, participants identified feeling invalidated, explaining leadership were not receptive to learner feedback. As Participant WE suggested:

> Particularly, the program director was keen to doing live learning, which was a bad thing, because the program director was not keen to change. He would listen or "hear us out,” but would not innovate or implement changes based on feedback. He would try to, but not want to.

Participant M expressed advocating for herself and fellow interns regarding trainee needs to make virtual learning methods more comfortable, “The challenges were not addressed right away, as it was out of their hands. We asked for a large classroom and for social distancing to be implemented. As a first year, we needed it more.” Participant T also felt disappointed by his program’s response to the change, “The program was too basic regarding this. They don't have the resources regarding the learning and tools to achieve deeper learning.”

Unprepared Instructors

An aspect of the lack of support within training and education pertained to instructors being unprepared to teach virtually, resulting in negative learning experiences. A possible reason may have been due to the increase in workload within the healthcare system. Participant T felt as though “The leadership was too busy to focus on changing the curriculum.” Participant N stated comparably, “For a moment, structured learning took a hit because of the strain the hospital system dealt with. Instructors cut out lectures because they had no time to teach. They went from seeing ten patients to 25.” Participant T noted a change in instruction quality:

Some instructors lost the quality of their teaching through online learning. You have to enunciate better and summarize, modifying slides, and we didn't have that. In person, attendings and instructors had good teaching skills but weren't trained to be teachers online. They had to be different in their teaching when switching modalities.

Studies seem to indicate that instructors may need to redesign the learner’s educational experience and tailor it to a remote or online context (Conrad et al., 2022). In a study conducted regarding nursing students, the participants perceived their instructors to be unfamiliar with online delivery methods. This indicates instructors may have been unprepared virtually, in professional settings, across higher education (Wallace et al., 2021).

Engagement

Participants observed a lack of engagement among instructors. As Participant Y expressed, “Presenters were not as engaged. Speakers who are engaged and motivated and keep the audience engaged and motivated are rare.” Participant Y admitted his program director was a rare instructor but did not share the same thought toward other program instructors.

Participant S communicated a lack of interest due to instructors also appearing disinterested, “Attendings began recording lectures, they got lazy with it. Many attendings refrained from doing lectures and just recorded their lectures. So then why attend? Why not do it on my own time?" Participant N stated learning more from clinic than lectures:

> The online methods weren't utilized very well. There was not a lot of structured teaching. I, you know, earned more learning from on-the-job teaching. The didactic learning is terrible. Barely any specialists to come talk to us, like almost one a quarter. Residents would keep didactic learning and prefer to work on patient care, even though didactics is protected time.

Technology

Many instructors were not properly trained to utilize technology in order to teach. As a result, they were unable to instruct residents to utilize the technology needed to access remote learning. As Participant DD explained, “Because the instructors were figuring out telemedicine, they couldn't teach the residents how to do so yet.” Participant S expressed, “Online methods were very well utilized, but not initially. There were so many problems at first.” Participant WS felt hopeless toward instructors, labeling them as “…faculty members who barely know how to work with slides, much less screen share?”

Feedback

As noted previously in the “Affected Learning” section, some program leadership did not respond to resident feedback. However, that was not the case for hospital site 1. Participant DD explained, “They tried every way to make it the best. Still, we collected trainee feedback and made it better. We applied teaching methods to keep people engaged, and the residents were responsive to it.” Participant SL felt her hospital site had attempted to prepare prior to the pandemic:

> The program always had the option of attending lectures virtually. The program director was a technology guy, and he pushed for the residents to know WebEx. He had a degree

> in computer science. Everyone had to know how to utilize WebEx. He encouraged remoted technology beforehand; he had prepared us.

Healthcare

Several participants expressed a lack of support from the healthcare system in general, and their specific hospital sites. Participant M identified feeling unsupported by her hospital, citing, “We did not have instructions on how to prepare for COVID patients, for example.” Participant WS stated that regardless of hospital support, her program tried to ensure trainee safety, and personal protective equipment (PPE), “The program did the best they could with the CDC information they had. They evolved with time.” Participant T explained his hospital site did not appear well-prepared:

> In regard to resources, the hospital was not prepared. There was not fit-testing for masks. There was also PPE uncertainty. The program could have pushed the hospital to deliver more resources. It made me question whether our ICU and our program was ready. It wasn't.

Accountability

A major theme not answered by the research question nor displayed in the literature addresses accountability. This theme explains the perception of participants in the role they played regarding their individual educational experience. Accountability is not a term found in the literature, however. Participant accountability also alluded to the cognitive presence of learning within the study’s Community of Inquiry (CoI) conceptual model. Ten (91%) participants indicated feeling a sense of responsibility and taking the initiative in their training because of the changes brought on by COVID-19. While Participant M expressed, “I held myself accountable; learning was my responsibility,” Participant WS began to “prioritize my learning needs first.”

Participant Y attested to accountability, proclaiming, "Learning falls on you. At the end of the day, you have to teach yourself. As an academic attending, you can't teach someone who doesn't want to learn or wants everything taught to them." Participant S seconded the sentiment, "…I had to pay attention for my own learning benefit." Participant WE viewed the situation the same, stating, "You had to do it, you just had to do it."

Participant T expressed, "I was self-motivated. I was learning how to learn better" by the change. Participant DD accepted the change "There was no other option. I was cool with it, because I still had to learn, and this was the only way to do it." Participant R explained being self-taught as not every instructor taught at the same skill level, "so I fill in the gaps and do it myself. I've always taken care of my learning, but that part increased."

Participant S expressed that not taking the initiative would lead to falling behind, "When you're held accountable for your own learning, you have to follow through, or you'll fall behind." Participant N narrated how he felt personal accountability in his learning during the pandemic:

> You use it [medical knowledge], or you lose it. My learning was more of what I made it. I had "I'm still a physician, I still have to learn" moments. I did a lot of individual reading. Even if I don't like a training or lecture, if they pour into me, I apply myself. To get things out of it.

Resources & Support

This theme explains the experiences participants shared with receiving support and resources from their corresponding residency programs. Although a shared theme was a lack of support, the presence of support in other areas was also mentioned during the data collection process. Previous research shows learner support is correlated with learner success and positive outcomes (Joko et al., 2020).

Resources

All three hospital sites across the studied institution provided their trainees with resources to aid their learning. In addition, three (27%) participants, one from each hospital site, stressed that didact time was protected time, reserved for resident education, which means that trainees were not expected to complete clinical work, etc. Before the pandemic, objective structured clinical examinations (OSCEs) were held at UCF in the form of simulations utilizing standardized patients to teach residents how to deal with patients. The simulations did not resume for at least four semesters.

Resources included journal club, a type of literature review among medical journals, and interdisciplinary lectures, such as lectures pertaining to social work or complex cases. Asynchronous studies included MKSAP, a resource with 1200 questions to prepare residents for the board, and Uworld, a board review given to senior residents. There was a John Hopkins required online module. Participant SW found the module to be very basic, in the form of board posts, stating residents did not like this resource.

Academic Half Days at hospital site 1 were split to separate interns at the beginning of the year and seniors at the end of the academic year to focus on board reviews, such as gastroenterology board review. Other resources included renowned journals, podcasts, social media, interactive cases from journals, and morning reports on a national level, where residents could share research and ask questions. Several participants, such as Participant DD and Participant MK, expressed that lectures were boring but became more interactive through stimulating games such as Kahoot, Jeopardy, and the creation of virtual versions of cases to resemble morning report. Participant MK expressed, “Online games where one could play and learn at the same time makes learning fun. The online methods have been getting better.”

At hospital site 2, Google Teams and WebEx were used, where it was simple to log in, log out, and utilize audio and video. The program assigned question banks containing 50 questions to create exams alongside MKSAP question quizzes. They also used JAMA (Journal of the American Medical Association) for case-solving. Participant M expressed, “We'd go over the cases together. The program implemented good resources.” In addition to quizzes, according to Participant S, the New England Journal of Medicine was also used as a resource to expand learning.

Program Support

Although programs and instructors appeared unprepared in some aspects, they seemed supportive in other respects. For example, hospital site 1 held a graduation ceremony for its graduating residents amidst a surge in the pandemic in June 2020. Participant WS shared the experience:

> Things were still bad, but the program planned graduation in a big conference room, and you could only bring one guest. They took a lot of safety measures. Used golf carts to showcase graduates while adhering to social distancing. Unlike my brother-in-law who also graduated in June 2020 from a California school in San Diego and it was done via Zoom. Our program tried to give us good graduation in the middle of pandemic.

In addition, the programs encouraged residents to utilize the institution’s EAP (employee assistance program) to treat any mental health issues. Program leadership was always welcoming, as reported by several participants, to trainees experiencing a difficult time and seeking support. Programs also hosted wellness activities, which returned in December 2021 at several hospital sites. Participant MK shared activities by his hospital site:

> The program now has wellness initiatives and meet-up activities. For example, in December 2021 the program hosted a Christmas party, although I was working nights and unable to attend. In March 2022 they hosted a BBQ, and played games.

Exposure minimization

Programs across the studied institution provided support by minimizing COVID exposure for its medical residents. The program at hospital site 1 protected residents and did not allow them to see COVID patients, according to Participant WS. In hospital site 2, the attending would see COVID patients. Only higher-level residents, such as seniors, as the patient load increased, treated COVID patients. Once trainees got vaccinated per hospital policy, they began interacting with COVID patients. Participant DD explained how her program shielded the learners from increased COVID risk:

> There were six ward teams at Osceola Regional. To minimize exposure, only 1 team was assigned to seeing only COVID patients. During the surges, it was increased to 2 COVID teams for a while. The ICU suffered the most during surges- 30 patients in the ICU per shift. The patients would stay on ventilators for months. We would focus on goals of care for the patients' families.

Sick leave

Another way programs supported their residents was by implementing sick leave should they get infected with COVID. The institution covered COVID-related sick days and did not penalize trainee annual sick leave allowances. However, the sick leave policy expired in January 2021. To combat the policy change, according to Participant DD, the program provided alternative solutions. Sick residents well enough to work were given learning assignments that counted as a work-from-home time to not deplete any allotted sick days. Residents were required to quarantine for ten days if they were sick or while awaiting COVID test results. The program also offered hotel room stays during clinical rotations to refrain from infecting families with COVID during the length of the rotation. As reported by Participant DD, most residents with elderly family members living at home utilized this option.

At hospital site 2, a “double jeopardy” system, a resident replacement system, was implemented to give residents time to get tested if they felt sick. The program also ensured residents had enough sick time. Participant R confirmed, “We did have support. The program was on top of everything and ensured coverage.” Enforcing a personal approach, the program leadership would check in on sick residents to obtain progress as well, as reported by Participant WE:

> The program did provide support. Everyone cared. The program director constantly texted us to make sure we were well. Our program coordinator also contacted us. We got feedback from one another. Colleagues would bring me meals while I was sick with COVID, too.

Feedback & information

Support was provided in the form of providing information and obtaining feedback. Participant S explained their program leadership met with the program once every other week to discuss changes and explore what would improve the resident learning experience. As a result of resident feedback, the program transitioned to in-person lectures after two months of virtual instruction. Participant WS believed her program did the best it could and evolved in its curriculum based on changing CDC guidelines. They also hosted town hall meetings to disseminate public health and general program information. Participant T shared that their program rearranged the schedule to fit the needs of the public during the emergency. He considered his program’s communication and leadership to be both straightforward yet challenging.

Community of Inquiry

Communities of inquiry (CoIs) are formed in remote learning when social, cognitive, and teaching presences collaborate in the trainee’s learning experience. This model was created to

support learning in higher education (Akti-Aslan & Turgut, 2021). The CoI model influenced the interview questions to better study how the format of remote learning created community. Each aspect of the model is discussed as applicable.

Cognitive

The cognitive presence within the community of inquiry model is how the study participants can construct or obtain meaning through communication in the learning change (Garrison, 2015). The manner in which participants felt their cognition changed due to the transition to remote learning was quite existential. Cognitive changes served as a coping mechanism to adapt to the change and apply new ideas. As Participant R explained, "I'm always a positive person. I knew at some point we'd figure it out, which we did, eventually. It was just frustrating."

This cognitive presence overlaps with the theme of accountability. Most participants found meaning in the change to remote learning by means of accepting responsibility for their own education. The change made some participants reassess the time needed to study outside of remote lectures to obtain the same quality of learning they received pre-COVID. For example, Participant M commented:

> The change maybe made me feel like I'm short or lacking in certain things. I relied on myself to read and learn. "Even when on, I wasn't completely focusing so I needed more study time during the work day to ensure the same amount of learning as pre-pandemic." people weren't attentive remotely.

The meaning was also found in the participant's abilities to adapt to the different learning styles incorporated in remote learning. Participant WS explained, "Remote learning happened fast. I had to adapt but I found the remote learning very meaningful. It was a new learning

experience, never had remote." In synchronicity, Participant N expressed the same feeling stating they continued to adjust cognitively to the learning changes, "I would go with the flow."

Participant N also changed his opinion on his learning environment, stating, "The big thing that COVID did was change our perspective on structured learning, and what wasn't my style. It made me lazy in my thinking, but the learning in those times is what one made it." On the other hand, Participant SL identified meaning in that she grew from remote learning. Remotely, she could Google words and terms to expand their learning. She had to work more mentally. She also had to exert more effort to pay attention, as it was easy to detach. She found meaning because she learned the importance of "paying attention for my own learning benefit."

Participant WE's meaning, contributing to the cognitive presence in the community of inquiry model, was realizing her learning style required a more active approach to learning. Sitting to "read and answer questions" seemed like double the work to this participant. Participant S had a more positive cognitive outlook:

> My attitude was positive. I was positive only because I didn't want to fall through the cracks. I knew it wasn't the program's problem, it was worldwide, and we still had to move forward. I had a positive attitude and tried to get engaged with our assignments. I think I was able to get some meaning out of my learning experience. When you're held accountable for your own learning, you have to follow through, or you'll fall behind.

Existential Lens

Three (27%) participants indicated finding existential meaning from the shift to virtual learning. For example, Participant WS began to prioritize her needs to better fulfill her learning experience. From an existential point of view, Participant DD noted:

> The change made me think as though we lost the feeling of community. It changed my thinking in that I started 'zooming out' and noticing things about learning that I had taken for granted, such as learning in a social environment.

Participant MK had an existential perspective on the experience that aided their cognitive learning as the facilitator and life-line between a patient and their family, as well as being the family to a patient having communicated with a facilitating doctor. He expressed:

> Yes, it added to the learning experience. I realized I was practicing medicine blindly prior to the shakeup that was remote learning. There were new medications, such as giving steroids to COVID patients. Now I first seek what the current data is to treat diagnoses. The data is enhanced as a result of remote modalities.

Participant T also found a cognitive change with the transition to online learning. His perspective involved the positive benefits that remote instruction employs on a macro level:

> Remote learning made learning available anytime, anywhere. It was meaningful to be able to access knowledge freely. I would like this availability of knowledge to be recorded so that I can return to it. I'd like access to organized data, in addition to lecture, to make it an even more meaningful experience. I was totally open, and happy they had online learning.

Social

The Community of Inquiry model's social presence is defined as learners' ability to communicate purposefully, identify with the community, and develop interpersonal relationships (Garrison, et al., 2010). Two (18%) participants reported no effect in the social community from the change to virtual learning. Participant M expressed, “I don't think the social aspect was affected. We got more teamwork in the clinical field in comparison to lectures. We were not around people during remote learning.” Participant Y also described it similarly, “It didn’t change much, as I always studied alone. I would only study in a group when teaching interns.” However, the other 9 (82%) participants detailed differently.

Physical Socialization

Medical residents socialize with their peers in and out of the education settings. Participant WS said that if residents *did* socialize, they would limit interactions to 10 people

because of the infection risk. Participant S had a similar experience, “Our gatherings were limited. We couldn’t meet with friends. It was depressing. Everything was closed.”

Participant T explained that social learning was significantly affected, “The time in between 11:00 am -12:00 pm in person was to hang out and socialize. During COVID, you didn’t see anyone at all, unless you were doing a rotation together.” Residents from Participant MK’s program also enjoyed the social time during lectures. As he explained:

> We don't hang out with residents. Before, we could go to [the local social venue], hang out, and talk after lecture. At least in morning report, you'd meet other teams. Everyone was on their computers. We still saw each other, kind of.

Participant SL reported looking forward to the social aspect of lecture time:

> Before COVID, I looked forward to Academic Half Day because all of the residents would be there unless they were working night shifts. One saw all of their friends and could catch up between the lectures. But with remote learning, the social aspect was completely gone. You could only see your colleagues' names on WebEx, the 'faces behind the screen,' and no one would even turn their cameras on. You resorted to texting during remote lectures for any social connection.

Social distance

Medical residents may have had instruction switched to online learning, but clinical training was still conducted in person at the hospital sites. Because of COVID-19, interactions with peers declined. Participant WS detailed the clinic experience saying, “Clinic was in person, with a lowered number of residents. It was nice to see classmates at least.” Participant MK reported, “It sucked that if you were in the COVID team, you were put in a COVID room and couldn't interact with peers. You were risking your health. You had goggles, gowns, big respirators on.”

In addition, some programs allowed residents to gather in lecture rooms together and watch lectures virtually from a centralized location. Participant WS looked on the bright side, “For one month, there was a guideline of no more than ten people in the room while everything

was still being held virtually." Participant WE stated in her program, "they would socially distance us by having us use a large conference room to watch lectures on the screen." Participant SL reported the same, saying, "For one month, there was a guideline of no more than ten people in the room while everything was still being held virtually."

General Social Loss

Outside the learning environment and within a more personal scope, participants experienced a sense of general social loss. Participant Y agreed, stating, "When sitting at home, there were no interpersonal interactions. Overall, there was no social time, and fewer interactions overall." To Participant N, the pandemic caused a scare among his local community:

> The pandemic was a scare amongst the community. It was a conservative town. It was conservation, the city enacted a shutdown curfew after 6 pm, and grocery stores were open until 9 pm. We were afraid of one another. We kept our distance.

Social Need

Three (27%) participants specifically spoke about their necessity for interactions to positively impact their learning ability. As Participant SL mentioned, "The lack of social interaction was stressful and hurt my overall learning." Participant N perhaps recounted a detailed explanation of the hindrance to their learning that virtual instruction caused. He explained, "With in-person learning, you would feel the environment and surroundings. I would have more stamina to concentrate in lecture for longer. My classmates would give me the motivation to continue staying focused in lecture. Participant R was also socially affected through the change of being assigned different lecture rooms, as it was hard to interact via Zoom/hybrid in comparison to pre-COVID conditions to contribute to a sense of "group think." She explained:

> Learning was definitely socially affected. We didn't see other residents as much. We were spread out, only 5-10 individuals per room, not all in the same room. There was a rule where you couldn't party or socialize during your personal time due to potential coverage issues if someone got infected. We didn't become close as we couldn't do much that year.

Social Effect

Loss of community

One of the adverse effects of a decrease in social learning presence was a loss of community. Participant MK explained, "Before, as an intern, you could meet the upperclassmen, PGY-2s and PGY-3s, because you were all in the same room. But now you do not meet in person and can't get to know each other." Participant WS expressed, "With remote learning, you saw no one. I didn't see anyone for 3-4 weeks. Everyone had to have cameras on in Zoom, to feel together." Participant DD stated that she and her peers mainly discussed COVID when they gathered in person. Otherwise, she felt:

> It made me think as though we lost the feeling of community. Haven't had large gatherings again. The PGY1s now have never experienced Academic Half Day (AHD) in person. It is remote still, while morning report is now in person. So yes, the social aspect of learning was definitely affected.

No collaboration

One disservice brought by remote learning was the lack of collaboration among medical residents. As Participant WE clarified, "The social aspect changed drastically, it was not the same interaction. Between electronic debates versus live debates, it was not the same. One could stand up, leave, move, or not pay attention. No intellectual debates, zero, nonexistent." Participant S also felt the quality of collaboration decreased:

> It wasn't that good. It was one thing having a discussion in a group of people to brainstorm and collaborate. But when you lose that, it affects your learning curve. We weren't able to hear different ideas and opinions. We lost teamwork and group think. We lost social learning. Colleagues were no longer able to six next to each other to discuss things.

Teaching

The teaching presence of the Community of Inquiry model pertains to how online courses are designed, facilitated, and directly instructed (Garrison, 2015). The findings in this section considerably overlap with the emergent theme of unprepared instructors. The participants expressed their perceived presence of instruction, what instructors did well, and the areas they lacked. Participant R summarized her views on the teacher-learner collaboration during remote learning:

> It doesn't matter that it's hybrid versus face-to-face or all in-person, as long as you know how to do it and how to instruct, interact, and as long as you're invested in teaching, it will be okay. Learners need to play their part, too, and be present during instruction. That is contingent upon whether you know the instructor will be engaging, otherwise you will be less interested, but if we all work together, we should make it a better learning experience and more convenient for other people.

The participant mentions the role and responsibilities of both the instructor and learner. However, it appears from their perspective that the role-setting in regard to remote learning should ultimately be set forth by the instructors for learners to follow.

Enhancements

Some enhancements made by instructors within remote learning included creating online modules to replace Academic Half Day and electives, a change made by the chief residents. Town hall meetings were also incorporated for pandemic updates to the programs, stated Participant WS. The chief residents, according to Participant SL, also worked hard to improve the quality of lectures by providing relevant topics so that people would pay attention. Beforehand, some lecture topics were entirely irrelevant to their learning and training.

Participant R mentioned an enhancement was the continual involvement of her program director. She stated, “Lecture was my favorite thing in the whole program. The program director

was very involved in it; he's just a brain. It was very interesting to see how many differential diagnoses you could get from a few complaints." Participant MK expressed gratitude in his program's ability to adapt and provide enhancements amidst the pandemic changes:

> The program actually has tried to make the learning experience better. They've always emphasized learning as being the most important. Compared to the beginning, it's way better. There are no recommendations. During morning report, a Word document was used for the data instead of writing small on a board. This helped because you had all the patient data, instead of taking notes while the instructor spoke.

Participant DD also reported that her program actively evolved in its teaching enhancements throughout the pandemic:

> I think the way we're doing it now is the best way there is. We really tried everything and are consistent. They plan lectures months in advance. They tried every way to make it the best. Still, we collected trainee feedback and made it better. We applied teaching methods to keep people engaged, and the residents were responsive to it. The program utilized Kahoot, Jeopardy, and became more interactive. They created a virtual version of cases to resemble morning report. Morning report and noon report also went virtual. Many more attendings were able to attend remotely, where in the past they would have to walk long distances to their offices. It was more convenient. They got creative with their presentations…

The participants have explained how teaching enhancements were implemented in their corresponding residency programs. This alluded to the teaching presence of the community of inquiry, improving their overall learning experience.

Engagement strategies

Some of the strategies the programs utilized to increase engagement, as reported by Participant N, included developing more in-depth presentations to show more visuals. Participant M explained that teaching presence varied by the faculty member, stating, "It was personality dependent. Some instructors would call on residents who would mute themselves, for example." According to Participant Y, the online methods were utilized by his program as well as they

could have been. He expressed, “The faculty and administration put effort into changing the presentation format and style to maximize engagement.”

The main change to increase engagement apparently involved modifying presentations to more interactive formats. This strategy was confirmed by Participant MK, who said:

> When COVID began, lectures were through Zoom. They got boring, but they added "cool stuff" such as Jeopardy and other online games where one could play and learn at the same time. It makes learning fun. The online methods have been getting better.

According to Participant S, his program director also provided interactive cases every other day and shared the screen to increase engagement.

Participant SL expressed that some instructors in her program attempted to call out on residents to keep them engaged remotely. However, it created awkward experiences when asking questions as no one would answer or speak up. They felt less scared the instructor might pick on them remotely. As a solution, anonymous poll questions were incorporated. Participant SL enjoyed the anonymous aspect of remote interaction as she could participate without the pressure.

Lack of Teaching Presence

Although Participant DD expressed that the presence of instruction was the same in-person and virtually, and Participant Y felt that the attendings took the same amount of time to teach as they did before the pandemic, that was not the principal opinion. For example, Participant T felt the leadership was too busy with the clinical side due to COVID cases to make meaningful curricular changes. Participant N stated a similar note, stating he learned more from on-the-job teaching, during his clinical rotation. He mentioned instructors had no time to teach due to increased patient load and eliminated significant portions from lectures.

According to Participant S, instructors became lazy and began pre-recording the lectures for residents to watch during their designated lecture time. He stated, " Many attendings refrained from doing lectures and just recorded their lectures. So then why attend? Why not do it on my own time?" Participant WE expressed that the presence of guest speakers and specialists was almost eliminated entirely. She also reported that the program director would focus on senior residents during weekly sessions, delegating inters and juniors to other faculty members instead.

Lack of engagement

The lack of a teaching presence further contributed to a lack of engagement from both the learner and instructor. For example, Participant S found the pre-recorded lectures to be boring and needed to be more interactive. Participant Y said the only individual who was “still into the instruction as much” was his program director. He exclaimed, “Other presenters were not as engaged. Attendings were unhappy with Zoom. They felt it was a waste of time, no one was listening, and they were not getting their point across.”

Participant T explained his perceived lack of engagement, “There was very basic use, such as turning it on and off. There was no effort or innovation. They didn’t make it fun.” Participant R felt the online methods *were* utilized, but not in an engaging manner. She stated, “We didn't use Zoom at the beginning, and the other platform wasn't as good. They could have done a better job at becoming more structured and making it engaging.” Participant DD also expressed that “People don’t learn from a PowerPoint. There should be more ways. People may struggle in remote learning because you have to adapt.

Lack of skills

A lack of teaching presence factor was the lack of skills regarding remote learning. For example, Participant DD felt that, “because the instructors were figuring out telemedicine, they

couldn’t teach the residents how to do so yet.” Participant N felt that the online methods were not well utilized due to an unstructured curriculum and the instructors not having the skills to alter curricula. Participant T expressed that instructors lack skills such as properly delivering presentations:

> Some instructors lost the quality of their teaching through online learning. You have to enunciate better and summarize, modifying slides, and we didn't have that. In person, attendings and instructors had good teaching skills, but weren't trained to be teachers online. They had to be different in their teaching, when switching modalities.

Participant T also stressed, “Enforcement is necessary to engage the audience and for them to commit to online learning.” However, Participant SL had an opposing view within her program. She expressed her program director was teach-savvy and had provided virtual lectures for residents who preferred remote learning.

> The program director had a degree in computer science aside from his medical degree. Everyone had to know how to utilize WebEx. The program director was a technology guy, and he pushed for the residents to know WebEx. He encouraged remoted technology before COVID, so he had prepared us.

Concerns-Based Adoption Model

The Concerns-Based Adoption Model (CBAM) is a component of Hall and Hord’s (2020) change theory. It involves investigating the effects, adjustments, concerns, and configuring that a change has caused in an education setting. This study adapted the model to explore how the participating medical residents adjusted to the transition of remote learning. In addition, the researcher also investigated the participants’ perspectives regarding how well their faculty members adapted to the virtual instruction change.

Levels of Use

The Levels of Use component in the Concerns/Based Adoption Model refers to the actions participants, such as educators, engage in as they become skilled in using an innovation and in adopting the change (Hall & Hord, 2020). In this study, the innovation is remote learning, as participants and their instructors adopted virtual instruction. There are eight levels of use, from no participant use of the innovation, to renewal of the innovation, see Table 4.

Table 4:

Levels of Use and Operational Definitions

	Level	Description
0	Non-use	The user has little or no knowledge of the innovation and isn't becoming involved.
1	Orientation	The user is inquiring information about the innovation or is exploring its value and its demands.
2	Preparation	The user is preparing for first use of the innovation
3	Mechanical use	The user focuses main effort on day-to-day use of the innovation with little time for reflection. The user is focused on attempting to master the takas required to use the innovation.
4	Routine use	Use of the innovation is stabilized. There are few or no changes made, and no thought is given to improvements of the innovation.
5	Refinement	The user varies the use of the innovation to increase the impact of influence.
6	Integration	The user combines their own efforts to use the innovation with related activities of colleagues to achieve a collective impact within their influence.
7	Renewal	The user reevaluates the quality of use of the innovation, seeks significant modifications to present innovation to increase its impact, and examines new developments in the field.

Source: Implementing change: Hall & Hold, 2020.

All participants utilized remote learning and surpassed the non-use level of use. Presently, some programs have returned to in-person instruction, as Participant N reported, but remote learning is available in a hybrid format during COVID surges. Across the institution, all three hospital sites only temporarily utilized remote learning between a mechanical and routine level of use for both learners and instructors.

However, one program reached the renewal level of use. Participant DD said she, alongside other chief residents at her hospital site, attended an annual conference to learn what new curricular developments could be implemented to improve remote learning and instruction. As reported by the participants, only hospital site 1 has not fully transitioned back to in-person instruction, but is scheduling the change for this upcoming academic year.

Stages of Concern

The Stages of Concern component of the Concerns-Based Adoption Model involves conducting interviews and obtaining open-ended statements that identify participants' attitudes and beliefs toward the change in question (Hall & Hord, 2020). This component includes seven categories of possible concerns related to an innovation, see Table 5 below. For the purpose of this study, the researcher explored participants' attitudes toward transitioning to remote learning.

Table 5:

Stages of Concern: Typical Expressions of Concern about the Innovation

	Stages of Concern	Expressions of Concern
Impact	6 – Refocusing	I have some better ideas about something that could work better.
	5 – Collaboration	I am concerned about relating what I am doing with what my peers are doing.
	4 – Consequence	How is my use affecting others?
Task	3 – Management	I seem to be spending all my time getting materials ready.
	2 – Personal	How will using it affect me?
	1 - Informational	I would like to know more about it.
Unrelated	0 – Unrelated/Unconcerned	I am more concerned about some other things.

Source: Implementing change: Hall & Hold, 2020.

Concerns raised by the study participants varied on the spectrum between impact and unrelated. For example, Participant DD expressed concern for the current medical residents

about transitioning back to in-person instruction. She said, “The current interns have never experienced AHD in person, they will not be able to go home, and must stay in the hospital. They won't like that.” This is an example of both unconcerned or unrelated concern as well as consequence stage of concern in the list of stages, as the participant is advocating for the needs of others.

Additionally, management was also a reported stage of concern. Three (27%) participants, Participant M, Participant WE, and Participant S, collectively expressed spending more time implementing self-study outside lecture time to maintain their prior quality of learning. Participant T expressed continually questioning whether his program was ready for the changes brought on by COVID and remote education. He reported brainstorming possible solutions to curricular challenges, adhering to the refocusing stage of concern. Finally, Participant S discussed experiencing both personal and collaboration stages of concern. He stated, “I didn't know if there was a solution to our training or curriculum dilemma.”

Innovation & Configuration

The Innovation and Configuration component of the Concerns-Based Adoption Model is meant to provide a clear picture of what constitutes high-quality implementation (Hall & Hord, 2020). The current configuration of remote learning appeared to be sufficient for some participants. For example, Participant DD expressed that lectures are now planned months in advance and added, “I think the way we're doing it now is the best way there is. We really tried everything and are consistent.” Another participant, Participant MK, shared Participant DD’s perspective, stating, “The program actually has tried to make the learning experience better."

They've always emphasized learning as being the most important. Compared to the beginning, it's way better."

The participants were asked about their perceptions regarding the configuration and future use of remote learning post-COVID. More than half of the participants (55%) reported feeling that the future of education and instruction will either remain or progress into a hybrid format. As Participant SL stated, "The program always had the option of attending lectures virtually." Only one (9%) participant perceived teaching in graduate medical education to become primarily virtual, see Figure 4 below. Four (36%) participants strongly hoped instruction would remain in-person. For example, Participant M exclaimed, "I did not like remote learning. I didn't like it at all. I was one of the first to demand in-person lectures."

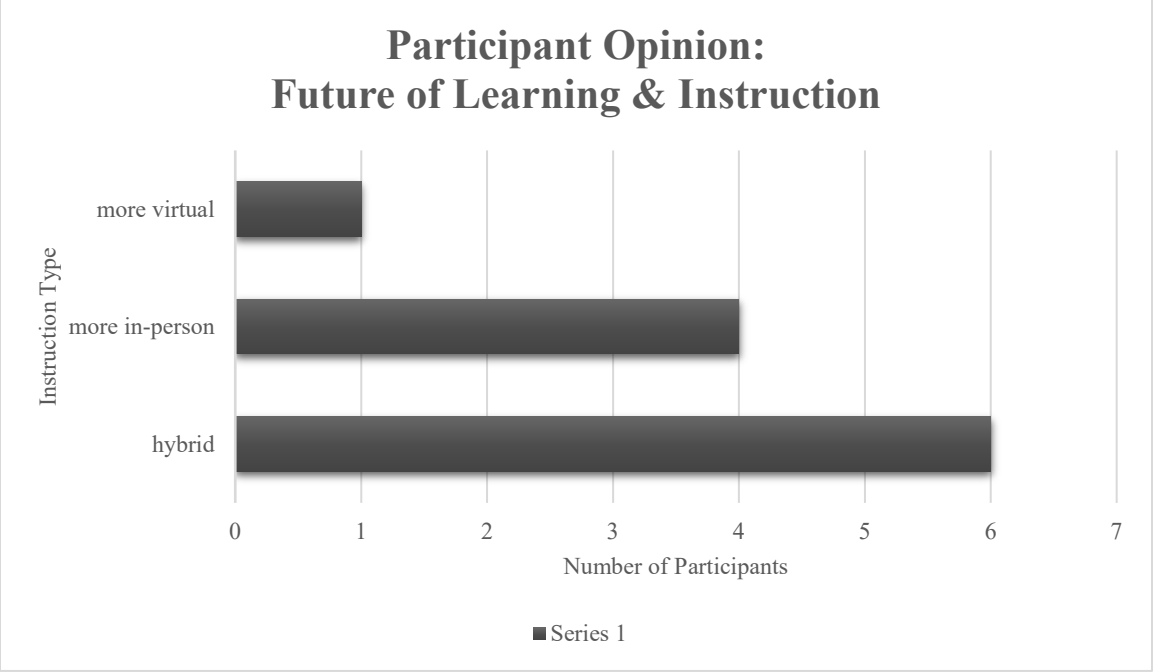

Figure 4: Participant Opinions on Future of Learning & Instruction

Participant Recommendations

The researcher asked participants what recommendations they would make to their programs to promote further innovation should another pandemic happen, and remote instruction is required again. Recommendations regarding institution preparation, instructor preparedness, and curricular improvement are discussed below. For example, Participant SL proposed the incorporation of virtual reality into remote learning as it would increase engagement, interactivity, and a sense of community.

Emergency preparedness

Two (18%) participants recommended the studied institution, and its various Internal Medicine residency programs create plans to implement structured changes in the event of emergencies. Participant T described details of an emergency preparedness plan:

> The institution should make a simple checklist of how to respond to a pandemic, such as "this is the app we'll use." We had too many options that people didn't know how to use. There should be a definitive plan and tools.

Participant R also proposed a plan to add structure during crises, including an analysis of remote learning's benefit for medical residents:

> The other thing is for them to be a little more structured in what's going to happen. Have a backup [plan]; if we do have to go to Zoom, how is it going to happen? And how will you make sure that everyone is involved and getting something from this? Because giving lectures for the sake of giving lectures without really expecting anything else is not good.

The participants also discussed training settings and setting exceptions. According to Participant T, not all topics related to their training can be taught online. He recommended that the programs "know what topics would fall under this exception, such as simulations, and plan accordingly. An idea could be teaching three residents at a time, socially distancing, while not shutting down the simulation lab completely."

Participant R expressed the conference rooms she and her peers utilized were small and crowded. Thus, she recommended:

> Definitely, GME (graduate medical education) could step up and create a place where we have a big room, like an auditorium, so if something like this happens again, we could be more spread out (socially distant), wearing masks, wearing goggles, yet still have the interaction of in-person experience.

Skills training

Another area of improvement pertained to providing training on the curriculum and online instruction to faculty members. For example, Participant T proclaims the institution should "instruct people how to teach, having the technology. They should also train on how to conduct online learning so that we don't disengage the learners." Participant R also provided a rationale as to why skills training is needed before beginning remote learning:

> Instructors should hold themselves accountable and responsible for ensuring learners are comprehending, retaining the information, and paying attention. There should be classes on how to teach, and how to structure curriculum. Instructors should be taught how to set up PowerPoints and make them interesting, such as including funny jokes within the educational content. Because the longer you make the PowerPoint, the more people will fall asleep. Get more grand rounds, which is commonly done via Zoom, allowing residents to interact with experts in Europe or instructors and specialists in the international theater.

Lecture structure & format

Participants offered various suggestions regarding the formats and structures of lectures. Participant M recommended implementing interactive methods in lectures, such as Kahoot. She stated that employing such techniques would improve the likelihood of learners becoming more present and attentive during classes. Participant S suggested structuring lectures to include mid-session discussions and eliminating recorded lectures. He explained, "With regard to remote learning, there should be no recorded lectures as they are boring. The program should not have

speakers that are just monotonously speaking. Lectures should be interactive and include discussions in the middle of sessions."

Participant R stressed the need for programs to become more structured in their remote learning curriculum and make lectures engaging. Participant N also stated similarly, expressing a need to structure didactics and to have a structured team develop a more comprehensive learning program. He added:

> There are 12 organ systems, and we only focus on one or two in our program. A wide variety of things in the toolbox should also be added, such as recorded videos, team activities, etc. There are so many options for learning.

Lecture topics & resources

Multiple participants commented regarding making changes to lecture topics and improving recourse dissemination. An example is Participant M's request that programs share pertinent information prior to the lecture. She expressed, "The documents should also be something easy and summarized to ensure the residents will read it beforehand." Participant S also reported a similar suggestion, including obtaining resident feedback via questionnaires regarding what topics they prioritize.

> The program should try to provide a questionnaire to understand what topics residents need to study. New topics should also be introduced, such as the discussion of the pandemic or the new guidelines. Our experience in obtaining pandemic knowledge was that we read the news ourselves or learned during pulmonary rotations. Materials should also be provided for residents, such as resources of the PowerPoints, beforehand.

This participant's suggestion adheres to both the levels of use and stages of concern aspects of the Concerns-Based Adoption Model. Both elements of the model are explored through the utilization of questionnaires and interviews for data collection.

Participant SL shared that many topics discussed during class were irrelevant to most residents and did not correlate to internal medicine board exams. Similarly, Participant R expressed creating a more concise list of topics to teach during didactics. She stated:

> Because we're in Internal Medicine, we only need to know certain things, the basics, and how to recognize things that are above our pay level. Sometimes the lecturers would get sidetracked, and they'd lecture us thoroughly on topics we did not need to know and were irrelevant to our learning but essential to their specialties. That's not something I need to learn unless I choose that fellowship. A curriculum should be created on subjects necessary for us to pass our board exams. Because if we have a patient that's very complicated, that's what consults with a specialist are for.

Learner engagement

Three (27%) participants suggested improving learner engagement in future remote learning situations. Participant WS reported her program overly utilized meeting remotely. She stated, "We don't need to meet in person much for 10-minute things. It's so easy. "Let's meet quickly," too much remote. It could have been an e-mail."

Participant WE expressed a need for less lecture time, stating, "Cases get repetitive. There are only so many COPD cases you can present. At the beginning as a resident, you want to get home to rest, and with lecture, 2 hours is subtracted from your day." Participant SL recommended requesting engagement from learners, such as requiring residents to ask at least one question per week during lectures. She also recommended changing the class culture:

> They should create a culture to normalize interactive lectures, as the program says it, but it never happens. We should work to change that culture of not asking questions, and it should be lead by the residents. It's necessary to interact in class.

The utilization of cameras appeared to be an essential change. However, there were opposing views per hospital site. Participant SL recommended for her program to require residents to turn on their cameras during lectures:

> Camera use was not mandated. You did not have to look like they were paying attention. The program may have handled it the wrong way, and let others slack off as a result. The program could enforce participation a lot more.

In contrast, Participant WS expressed the opposite, stating, "Stop being militant with these cameras. Even studies show that you become more distracted, regardless of good intentions."

Other Improvements

Other improvements pertained to hybrid flexibility and providing resident teaching opportunities. Participant Y recommended programs allow medical residents to obtain more teaching opportunities as a way to improve learning and retention. He discussed, "Teaching helps you learn and retain information. The best form of learning is when you're teaching yourself or others. The program should focus more on residents as teachers, and encourage them to present, in order to improve on their own knowledge."

While Participant M felts that learning should be more interactive and that "there should be in-person options whenever possible," Participant WS suggested that "to stay relevant, you need to offer both live and virtual didactics." Participant Y felt "it will progressively continue; we will see more and more virtual teaching." Participant T expressed feeling hopeful regarding programs becoming more aware of different learning styles. He stated, "We are going to embrace a culture of having multiple learning styles; some in-person and some online. It should be hybrid, as long as you're learning. It should be kept multimodal, and the knowledge content should also be assessed."

Conclusion

In this chapter, participants described their experiences of the instructional transition to remote learning due to COVID through identified shared and non-shared lenses. They also

explained how their remote switch affected the social, cognitive, and teaching aspects of learning, as characterized by the Community of Inquiry Model. The participants discussed the levels of use, stages of concern that emerged by the changes caused by the pandemic, and their recommendations and observations of innovation and configuration, as outlined through Change Theory's CBAM model.

CHAPTER 5: DISCUSSION

Introduction

In the preceding chapters, data analysis and presentation have been reported. This chapter consists of a summary of the study, a discussion of the findings, implications for practice, recommendations for further research, and a conclusion. The purpose of the latter sections is to expand upon the studied concepts in an effort to provide a further understanding of their possible influence on the transition to remote learning and the lived experiences caused by COVID-19. It also serves to present suggestions for further research targeting emergency preparedness in higher education and graduate medical education, as well as instructor perspectives. Finally, a synthesizing statement is offered to capture the substance and scope of what has been attempted in this research study.

Summary of the Study

This chapter begins with a summary of the purpose and structure of the study and is followed by the major findings related to the lived experiences of internal medicine medical residents during their transition to remote learning as a result of the COVID-19 pandemic. Conclusions from the findings of this study are discussed concerning the Community of Inquiry conceptual model and Concerns-Based Adoption Model theoretical framework. Finally, implications for practice and recommendations for further research are presented and discussed.

The purpose of this study was to explore the lived experiences of internal medicine medical residents within one college of medicine in Central Florida regarding the change from face-to-face to remote learning due to the COVID-19 pandemic. This study investigated the learning benefits experienced as a result of remote learning. The researcher also explored

identified challenges or issues caused by the learning modality shift to virtual instruction with the participants.

Participants were interviewed via Zoom and asked about their learning experiences in their internal medicine residency program training before and during COVID. The participants were additionally asked how their training and learning experiences changed during the COVID-19 pandemic, what transitioning to remote learning was like for them, how they coped with said changes, the recommendations they would suggest to their programs for the future, and their beliefs of the future of instruction post-COVID-19. This study included 11 participants selected through convenience sampling by contacting their program coordinators. Participants also referred colleagues through word of mouth. The study included one principal research question and three sub-questions:

1. What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19? This question includes:
    a. What shared and non-shared experiences, if any, existed between the residents?
    b. What were the benefits, if any, of remote learning, compared to face-to-face instruction?
    c. What were the observed limitations, if any, of remote learning, compared to face-to-face instruction?

The research questions were answered qualitatively from the data obtained from interviews conducted via Zoom, where participants provided responses to open-ended questions. The data was categorized, coded, and analyzed via Dedoose software. Themes surrounding

participant lived experiences regarding the transition to remote learning were identified from the data to determine the shared and non-shared experiences among the participants, in addition to perceived benefits and challenges of remote instruction.

Discussion of the Findings

Previous researchers studied the impacts that COVID-19 had on the healthcare and education industries. Research has also been conducted into the effects of remote learning in higher education, identifying benefits and barriers. However, research was not found in the literature regarding the lived experience of medical residents in internal medicine residency programs as they transition to remote learning due to COVID-19. This section discusses the findings of each research question.

Some themes found in the data do not align with the research question. It appears as though participants expanded on their experiences beyond what this study initially wanted to explore. For example, much of the participant narrative involved the perspective or contribution of chief residents. Chief residency is not synonymous with the medical residency role or experience. However, the inclusion of chief residents allows the opportunity for further research.

Overall, the research findings agree with and support the past literature in this field. This research study found that the COVID-19 pandemic was a time of many changes and quick adjustments that led to mental health issues and solitary educational journeys for participants. Findings are supported by the work of Wallace et al. (2021). Much like the nursing students in their study, where nursing participants showed resilience and perseverance despite the sudden transition to remote learning, these study participants overcame the change to remote learning by

practicing personal accountability (Wallace et al., 2021). Participants made learning their responsibility, regardless of the decline in teaching and learning quality while in the classroom.

However, the findings refute the work of Joko et al. (2020), who found that mobile learning improved student competence. This study found that remote education improved learner resilience and motivation in self-learning rather than competence. While Serhan (2020) highlighted the flexibility of the remote modality, this was also found as a benefit to this study's participants. The modality change to remote learning allowed study participants the freedom to take ownership of their education and also improve their wellness during their freed time.

Some challenges of the shift in modality were caused by the instructor's skill level in remote learning. The research also supported these challenges, as Konecki (2020) found that remote instruction was new to many teachers, causing concern regarding whether online learning could produce the same quality of teaching as face-to-face instruction. This study's findings would imply that the educational quality initially declined until program directors and chief residents made curricular changes.

The literature also supports the recommendations found in this study. For example, Teele et al. (2020) found that within GME, such as in a pediatric cardiology fellowship, there was a lack of established learning management systems to be implemented. This current study's findings include participants' suggestions for future improvements, such as installing protocol for remote learning during times of crisis and emergencies to ensure better preparation and a smoother transition. This recommendation aligns with the work of Conrad et al. (2022), who studied student perceptions of online learning through Canada's response to the COVID-19 pandemic. Their research found the need for higher education institutions to change their

pedagogical approach in an online context to systematically restructure the student learning experience (Conrad et al., 2022).

Other research that was corroborated by this current study pertained to chief resident challenges experienced as they supported medical residents through program and curricular struggles (Tisdale et al., 2020). As previously stated, this study was not meant to explore chief residents, but data did emerge regarding their critical support role to medical residents during this experience. There was a consensus in both the study and research literature regarding struggles as a community. Conrad et al. (2022) also cited the lack of social interaction and class format as added challenges to the modality shift to online learning.

This study explored the experiences of internal medicine medical residents through this COVID-19 ordeal, as they managed educational and healthcare challenges simultaneously. The participants experienced benefits and challenges that have been similar to other learner experiences throughout higher education, as found in the literature. However, they also experienced trauma and difficulties as healthcare providers that uniquely affected their perspective and ability to adjust to the shift in learning modality. Further findings are discussed by research question.

Research Question One

What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19?

The findings indicate that the medical residents in this study had different experiences compared to their pre-COVID training due to the pandemic and transitioning to remote learning. Participants experienced the uncertainty of the future, such as whether their program would be

discontinued. To that effect, a study conducted by Hasan and Bao (2020) found that learners suffer from fear of losing training or their academic year due to the COVID-19 pandemic. The study findings indicate curricular disruptions, such as canceled clinical rotations, training electives, and elective surgical procedures, consistent with the research as residents complained of fewer training hours due to canceled electives (Khalafallah et al., 2020).

Research Sub-Question One

What shared and non-shared experiences, if any, existed between residents?

Shared experiences among study participants included their initial perceptions of the COVID-19 pandemic. Participants did not comprehend the severity of the situation nor understood the changes the pandemic would cause. Participants shared similar experiences related to travel difficulties, family challenges, and the inability to see their families due to border and travel restrictions, as the majority of participants were non-United States citizens.

Additionally, participants perceived their time off due to the shutdown to feel like a vacation away from clinical rotations and training electives. During training, however, it was received that medical residents felt overworked and overly dependent upon by their hospital sites. At times, they expected to be pulled to fill in during shortages and pandemic surges. Graduate medical education, as evidenced by the research, experienced heavy workloads due to infection rates, alongside short staffing due to illnesses (Anton et al., 2020).

Themes found in the study pertained to increased accountability, mental health challenges, chief residency curricular contributions, negatively affected learning, and the importance of resources and support. The literature indicated that learners taking responsibility for their education was a challenge in the remote learning transition (Konecki, 2020). The

findings show participants felt an increased sense of responsibility that improved their learning experience, aside from increasing personal study time.

Mental health was a significant theme in both the study and research. The findings indicated participants suffered from a range of psychological distress, including anxiety due to uncertainty and health risks, depression due to factors such as social isolation, burnout, compassion fatigue, stress due to the number of adjustments, and trauma as a result of frequent COVID mortalities. According to Searle (2007), the presence of compassion is a vital factor for disaster management and preparedness. This factor could indicate that resident burnout and an increase in compassion fatigue could hinder the program's readiness to face emergencies. The literature suggests medical residents and clinical fellows experienced burnout, anxiety, and stress during the onset of the COVID-19 pandemic (Bansal et al., 2020).

Chief residency curriculum support was a theme in the study findings. Chiefs obtained feedback from the institution's programs and made changes, such as creating online modules to replace missed electives. In the literature, chief medical residents played an administrative role in programs, implementing changes such as transitioning morning report and noon conferences on online platforms like Zoom (Tisdale et al., 2020).

Study findings indicated medical resident learning was affected by various factors, including a change in exposure to diagnoses, canceled electives, and monotonous virtual lectures. Participants showed that the lack or presence of program resources and support either helped or hindered their learning during the transition to online learning. The research indicates similarly as learning engagement was interrupted without adequate learner support (Alvarez, 2020). In a study by Tawafak et al. (2020), learners were encouraged to work in groups in order

to provide each other with support. Findings indicate group collaboration was not prevalent among study participants.

Non-shared experiences by the study participants included experiencing imposter syndrome of their medical abilities and experiencing pregnancy as a medical resident during the pandemic, and getting infected with COVID during the pregnancy. Neither of these experiences was found in the literature. One participant experienced the transition to remote learning from two separate residency programs at different institutions during the onset of COVID-19. No studies were found indicating study participants with multiple perceptions due to having transferred residency programs during the pandemic.

Furthermore, findings indicated few participants felt resentment toward patients who risked their health and increased the likelihood of infecting themselves and others. This sentiment was not found in the literature. Other non-shared experiences involved attending fellowship interviews virtually; a cost-effective benefit that was found to help save an average of $566 for residency interview applicants at the onset of the pandemic (Jones et al., 2020), which was a common occurrence in the literature (Huppert et al., 2020).

Research Sub-Question Two

What were the benefits, if any, of remote learning, compared to face-to-face instruction?

The study participants experienced various benefits from the change to remote learning. Attending lectures from home added comfort and eliminated the need to commute and travel great distances. Research indicates that a benefit of asynchronous learning by medical students was the elimination of commute time for in-person classes, which helped improve time management (Khalil et al., 2020).

Participants in this study found distractions to be beneficial, such as being able to work on research projects or patient charting during lecture time. Although distractions were cited in the literature, no research was found to refer to learning distractions as beneficial. Additionally, remote learning provided the opportunity to invite guest speakers from across the country to share their expertise with the studied institution. Tisdale et al. (2020) found that hosting virtual game nights improved a sense of community and allowed for guest hosts to participate from another geographical location.

Although no studies were found detailing how remote learning may have resulted in positive outcomes for learner mental health, study participants reported experiencing improved wellness as a result of changing to remote learning. The added free time allowed participants to focus on their psychological and physical health. The participants experienced improved access to medical knowledge, convenience, and a broad array of learning resources, such as medical journal subscriptions. According to Berg and Simonson (2016), one element of remote learning is that it offers accessibility and convenience to learners and instructors who may be separated by time or location. In healthcare, social media outlets such as Twitter allowed staff to collaborate and share knowledge during the pandemic (Almarzoo et al., 2020).

Research Sub-Question Three

What were the observed limitations, if any, of remote learning, compared to face-to-face instruction?

As evidenced by the literature, the challenges faced by the participating medical residents were also experienced in previous research studies. Participants experienced distractions during remote lectures. They also experienced a lack of interest in lectures due to the lack of interaction

and engagement between the instructor, learners, and content material. According to Serhan (2020), participants experienced a negative effect on their motivation for learning due to virtual instruction. Other challenges included technical difficulties, poor educational qualities, distractions, and low quality of interaction, as well as instructor feedback (Serhand, 2020).

Participants felt fear of speaking up and expressing their educational needs to their instructors, which parallels low instructor feedback from previous studies. The participants and the literature experienced technical difficulties such as sound issues and problems setting up remote platforms. Study participants noted a lack of quality in teaching, such as fewer interactions and watching pre-recorded lectures instead of experiencing a stimulating and engaging live, virtual lecture. Many felt their instructors were not well-equipped for teaching remotely. According to Hasan & Bao (2020), instructors' lack of readiness or knowledge in implementing e-learning was a barrier experienced within remote learning.

A final challenge was the lack of social presence in the learning environment as characterized by the Community of Inquiry model. Many participants reported feeling isolated and missing group collaboration toward medical cases in lectures. The researcher also found this barrier to having been a common experience in the research. According to Abbasi et al. (2020), the participants in their study indicated an increase in isolation and a decrease in interaction. This could indicate a universal experience.

Theoretical Framework & Conceptual Model Findings

The researcher utilized two models to design this research study. The theoretical framework was adapted from Hall and Hord's (2020) Concerns-Based Adoption Model (CBAM) as a component of their developed Change Theory. The conceptual framework was adapted from

the Community of Inquiry Model by Garrison et al. (2001). Both frameworks were in alignment with the methods employed in this research study.

The stages of concern element of CBAM is meant to identify beliefs toward a new initiative, such as toward the change to online learning (Hall & Hord, 2020). It identifies ideas through the utilization of interviews or questionnaires for data collection and helps address specific concerns. The levels of use element of CBAM is another interview tool that assists in determining how well the change to online learning was used (Hall & Hord, 2020). This study utilized the CBAM model and identified the residency programs as having used remote learning on the spectrum between mechanical use, where there is day-to-day use with no innovation, and routine level of use, where there is a little innovation causing some improvements to be made. One program reached the renewal level of use by attending conferences to learn about new developments in remote learning and instruction. Finally, the participants ascribed to innovation by making program recommendations to improve further.

Similarly, the Community of Inquiry Model aligned with participant responses regarding changes in learning. Participants discussed the changes in teaching, including the absence and presence of instruction within their remote learning community. Participants also expressed experiencing both the absence and presence of a social community in their peers. Finally, the participants narrated their experiences in cognitive changes as a result of remote learning. The findings highlight the importance of a community of inquiry created to support remote learning in higher education.

Implications for Practice

Implications for practice as they affect research, practice, and the broader scope of the field are discussed. Changes to the field of study for improvement in data collection are proposed. The researcher also discusses the gaps in the literature that are answered by this study. Finally, the researcher explores what the research data could imply in the local, national, and global spheres.

Research-Based Implications

Within this field of research, many angles and perspectives can be added to the literature. As stated previously, no qualitative research was found in the literature, indicating a need for more qualitative studies. This may perhaps be because medicine is more quantitative in nature, aside from singular case studies detailing unique medical disorders or diagnoses. One change I would propose is to continue creating more studies designed to explore the lived experience of those in graduate medical education. Instead of collecting data through the use of surveys and questionnaires, conducting participant interviews allows for a discussion of lived experiences and emergent phenomena (Creswell & Poth, 2018).

Practice-Based Implications

During the creation of this study, other similar studies were simultaneously conducted. For example, Wallace et al. (2021) conducted a study at a nursing school in Washington State to explore nursing students' experiences in remote learning due to COVID-19. The results mirrored this research study, also finding the faculty members to be unprepared for remote instruction. In addition, it was found that the nursing students did not know when to approach faculty during

lectures, as some participants in this current study stated. Nursing students also suffered from distractions, connectivity issues, and not being tech savvy (Wallace et al., 2021). More research will emerge that may detail similar findings. However, this study provides data and answers to the literature gaps regarding lived experiences in graduate medical education during the COVID-19 pandemic, internal medicine medical residents in particular.

Broader Implications

Natural disasters and hurricanes such as Hurricane Katrina (Lipka, 2005) and health crises, such as the SARS coronavirus, H1N1 pandemic, and MERS coronavirus (Council on Foreign Relations, 2021), have happened in the past and will undoubtedly reemerge in the future. Therefore, it becomes vital to ensure that higher education and graduate medical education are prepared for the changes needed to maintain a learning environment remote during impending crises. As Participant SL stated when asked for any final thoughts after her interview, “Hopefully, we’re just better prepared for pandemics in the future, hopefully.”

This study was useful to the studied institution in that it identified how the programs within the institution were and were not prepared to adopt a virtual method of instruction and were instead tackling the change with a Laissez-faire approach. The general consensus from study participants is that hybrid instruction will continue, but we must learn from the mishaps that occurred during the remote learning transition for the next occurrence. Program leadership can consider participant recommendations to further improve remote learning in the future. These recommendations include implementing skills training to instructors to modify lectures and PowerPoint presentations to virtual modalities. As the participant, Participant WS, stated

toward the end of her interview, “We should measure success by how the residents feel, because residents had it bad.

This study will also be helpful to graduate medical education on the national level. The study shed light on how a virtual instruction, or a hybrid model of learning broadens access to medical knowledge outside of one’s local community. Additionally, collaborating with other medical residencies across the country allows for networking opportunities and a chance to further scientific progress in the medical sphere. Moreover, this institution provides insight into strategies that proved helpful in improving remote learning, such as incorporating interactive methods into instruction. The study also identified instructional challenges within remote education, such as pre-recorded lectures decreasing learner engagement.

For other researchers, this study provided insight into the experiences of internal medicine residents are a specific higher education institution in Central Florida. The benefits and challenges experienced at this institution may not be relevant nationally or internationally as other variables, such as the cultural attitudes toward public health crises, may skew experiences. However, this institution provided participants with three separate internal medicine residency programs, broadening the variety of experiences. Nevertheless, this study added to the current literature regarding the benefits and challenges that medical residents encountered as they faced changes brought on by the COVID-19 pandemic, which may contribute to universally shared factors, such as the mental health impacts.

Recommendations for Further Research

This study was explored at a critical time during the COVID-19 pandemic. The research was immediate, given the circumstances, speaking to the timeliness of data contributed to this

field. Nevertheless, gaps in the current research remain to be studied. The community can expand beyond the current scope. However, a potential limitation to future research could be the researcher's connection to the population having contributed to high participation, which may not yield the same results if duplicated. This section discusses areas in the field to research further.

Emergency Preparedness in Higher Education and GME

Crises and disasters such as the COVID-19 pandemic raise the question regarding emergency preparedness in higher education. Whether there are earthquakes in New Zealand, hurricanes in the United States, fires in Australia, or global pandemics, learners are negatively affected, and higher education is impacted as a result. It is evident that students tend to experience higher levels of distress following crises such as natural disasters (Watson et al., 2011). Research shows the field of higher education is steadily becoming aware of the lack of emergency preparedness issues. Therefore, preparedness is essential in taking preventative measures and putting processes in place to ensure proper disaster recovery for learners afterward.

The current COVID-19 pandemic may have been the first health crisis to affect the globe of this magnitude, but it will not be the last. If the past events we have experienced during the 21st century serve as an indicator, we may have more frequent disease outbreaks and more extreme natural phenomena. Therefore, assessing how prepared higher education is for impending crisis and what improvements can be made is vital.

An area of research interest could be determining whether higher education is prepared regarding disaster relief plans in place for a crisis. The main research question to be studied

1. How do disaster relief plans within graduate medical education programs respond to medical resident needs?

See Appendix F for research and interview questions pertaining to the study of emergency preparedness. The research would aim to know how higher education can improve. In addition, an additional study could shed light on how we can use the findings to improve the overall curriculum and policy development around disaster issues.

Instructor Perspectives

The COVID-19 pandemic uncovered a lack of emergency preparedness within higher education. Accommodations for continued instruction included a transition to remote learning. However, little research exists regarding the experiences of medical residents during this transition in their education meanwhile combating the COVID-19 pandemic.

A study could be conducted focusing on the teaching strategies used and recommendations to suggest to internal medicine program directors and faculty members for additional improvements. The researcher could focus on the teaching strategies that were utilized during this time and what recommendations could be suggested to the program directors and faculty members for further improvements. Interviews conducted could be executed through a focus group format with program leadership; see Appendix E for a list of potential focus group questions. This would allow the researcher to obtain data collection through the general group consensus. The study could ask a research question yet to be answered:

1. In what ways, if any, can the findings be utilized to improve the overall curriculum and policy development around disaster issues concerning graduate medical education for institutions of higher education?

The researcher can also explore how the study findings can be utilized to improve the overall curriculum and policy development regarding disaster relief plans for crises. A focus group could be conducted with the internal medicine leadership, such as program directors to obtain insight from the instructors regarding the transition. The findings could then be shared with the program directors to shed light on curriculum improvement for times of crisis.

Researcher's Next Steps

All the studies mentioned continue to leave opportunities for further research exploration. The researcher will therefore continue to further study the experiences in graduate medical education due to the COVID-19 pandemic. One study area the researcher is interested in pertains to the impact of online curriculum within residency programs to medical residents. The researcher would again utilize Hall and Hord's (2020) change theory as the theoretical framework to guide the research design. A second study would research the chief residency experience and their unique perspectives as program administrators during the COVID-19 pandemic. Chief residents are physicians who have recently graduated from their residency programs and would generally have to adjust to instruction and administration before including the need for crisis planning due to the COVID-19 pandemic (Tisdale, Filsoof, & Singhal, 2020).

A final study would explore the lived experiences of instructors teaching medical residency program curricula virtually. The literature did not show any studies conducted exploring instructor perspectives in graduate medical education during the COVID-19 pandemic. According to the findings and participant narrative, graduate medical education instructors, who are also clinical physicians, experienced a 150% increase in patient load. This may have been the

justification behind recording lectures for medical residents, as indicated by participants. There are many avenues in the research still left to study.

Conclusion

The findings of this study expanded previous researchers' work in transitioning to remote learning in graduate medical education as a result of the COVID-19 pandemic. This investigation revealed that internal medicine residents experienced benefits and challenges while transitioning to remote learning during the COVID-19 pandemic. Analysis showed the adjustment of overall changes from the COVID-19 pandemic, in addition to transitioning to remote learning, affected the resident learning experience. Medical residents were affected on curricular, social, and cognitive levels. A lack of support and resources hindered the adjustment process to remote learning, but program support and curriculum improvements by the leadership and chief residents enhanced the learning experience.

The literature indicates that remote learning can provide benefits such as convenience and challenges such as combating distractions while attending lectures at home. Recommendations suggested by participants to improve program methods for remote learning transitions revealed the importance of adequately training instructors for teaching virtually. The literature indicates a need for emergency preparedness in higher education to provide a more seamless learning experience for learners transitioning to remote learning due to natural disasters and crises such as the COVID-19 pandemic.

APPENDIX A:
E-MAIL SCRIPT TO PROGRAM DIRECTORS

Dr. [Program Director name],

Good morning. My name is Stephanie, the Institutional GME Coordinator at the UCF College of Medicine. I was wondering if we could set up a brief phone meeting. This is in regard to my research in graduate medical education and my upcoming dissertation research study. When would you be available for 15-20 minutes? Thank you in advance.

Respectfully,
Stephanie

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UCF | College of Medicine
UNIVERSITY OF CENTRAL FLORIDA

APPENDIX B:
PHONE SCRIPT FOR CALL MEETING WITH PROGRAM DIRECTORS

Good morning:

Thank you for meeting with me. Again, my name is Stephanie, the Institutional GME Coordinator. I believe we may have met before during one of my hospital visits. You may not be aware, but I am also a doctoral scholar at UCF and am earning my doctoral degree in Educational Leadership. I begin my dissertation hours next month and defend my dissertation proposal in 4 weeks.

I originally wanted to research mental health in medical residencies, and how residency training impacts the resident's mental health. Because it was too heavy in mental health and not enough in higher education, the topic was denied. My topic now is the impacts, both benefits and challenges, that Internal Medicine medical residents experienced in the shift to remote learning due to the COVID-19 pandemic.

It is a phenomenological qualitative study. My aim is to interview three residents per hospital site on this topic in the fall. However, I also had the idea of conducting a focus group with you as the Program Director as a needs assessment, for you to guide me on areas I should focus more during my interview. I am still working with my committee methodologist as to whether this is a scientifically sound idea to my research idea. Nevertheless, I wanted your approval and acknowledgment before I begin. My goal is to contribute to GME by sharing my findings with you, and any potential recommendations on how to enhance the program or curriculum even further.

Would this be okay with you? Also, I will be seeking UCF IRB approval. Would you happen to know, or would you be able to direct me to the person who would know whether I would also need to seek HCA IRB approval? The residents as participants would be UCF employees but do physically train at HCA. Any feedback you can provide would be appreciated.

Again, thank you so much for your time and for having met with me. I am grateful for your understanding and support. Do you have any questions for me?

APPENDIX C:
PARTICIPANT INTERVIEW QUESTIONS

Questions to be asked in the *participant interview* include:

1. Tell me about your personal background and what led you to this residency program, please.
2. What is your current PGY (program year) level in the program?
3. Tell me about your internal medicine medical residency learning experience.
    a. What was your training program like pre-COVID?
    b. What was a typical day or week during training like pre-COVID?
    c. What were lecture and learning like for you pre-COVID?
4. How did your training and learning experience change during the COVID-19 pandemic?
5. What changes did you experience if your life overall as a result of the COVID-19 pandemic?
6. How was the experience of transitioning to remote learning like for you?
    a. In what ways did you find it beneficial?
    b. In what ways did you find it challenging?
    c. Were any of the challenges addressed or changed by your program? If so, how?
    d. How did this change make you think? How were you able, if at all, to create meaning in your learning experiences?
    e. How did the presence of instruction change as a result of the modality shift?
    f. How did this change affect your social aspect of learning? Was a sense of community felt within the shift?
    g. How would you characterize your attitude toward the shift to online learning? Any specific concerns?
    h. How well were online methods utilized in your program, in your opinion?
7. How did you cope with the changes brought on by COVID-19?
    a. Did your program provide support? If so, how?

8. Do you recommend any changes be made to improve the learning experience in your internal medicine medical residency program? If so, what would they be?
9. How do you see learning and instruction being carried out in the future, post-COVID-19?
10. What else would you like to share with me before we conclude our interview?

APPENDIX D:
RESEARCH & INTERVIEW QUESTION CORRELATION

Research Question What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19?		
Interview Question	Framework of Conceptual Model Used	Analytic Code
1. Tell me about your personal background and what led you to this residency program, please.	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	General background
2. What is your current PGY (program year) level in the program?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	General background
3. Tell me about your internal medicine medical residency learning experience.	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	Shared experiences Non-shared experiences CBAM Levels of use
3a. What was your training program like pre-COVID?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	Levels of use if applicable
3b. What was a typical day or week during training like pre-COVID?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	Levels of use if applicable
3c. What were lecture and learning like for you pre-COVID?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	Levels of use if applicable
4. How did your training and learning experience change during the COVID-19 pandemic?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Stages of Concern	Affected learning
5. What changes did you experience if your life overall as a result of the COVID-19 pandemic?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Stages of Concern	Travel difficulties CBAM stages of concern feelings
6. How was the experience of transitioning to remote learning like for you?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Stages of Concern	accountability
6a. In what ways did you find it beneficial?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Levels of Use	benefits
6b. In what ways did you find it challenging?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM)	challenges

Research Question What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19?		
	Levels of Use	
6c. Were any of the challenges addressed or changed by your program? If so, how?	Community of Inquiry Model Conceptual Framework Teaching Presence	Program support Unprepared instructors COI teaching presence
6d. How did this change make you think? How were you able, if at all, to create meaning in your learning experiences?	Community of Inquiry Model Conceptual Framework Cognitive Presence	COI cognitive presence Accountability if applicable
6e. How did the presence of instruction change as a result of the modality shift?	Community of Inquiry Model Conceptual Framework Teaching Presence	COI teaching presence unprepared instructors
6f. How did this change affect your social aspect of learning? Was a sense of community felt within the shift?	Community of Inquiry Model Conceptual Framework Social Presence	COI social presence
6g. How would you characterize your attitude toward the shift to online learning? Any specific concerns?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Stages of Concern	CBAM stages of concern COI cognitive presence if applicable
6h. How well were online methods utilized in your program, in your opinion?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Levels of Use	Program support CBAM levels of use COI teaching presence if applicable
7. How did you cope with the changes brought on by COVID-19?	Community of Inquiry Model Conceptual Framework Cognitive Presence	Mental health COI cognitive presence if applicable
7a. Did your program provide support? If so, how?	Community of Inquiry Model Conceptual Framework Teaching Presence	Program support COI teaching presence resources
8. Do you recommend any changes be made to improve the learning experience in your internal medicine medical residency program? If so, what would they be?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	CBAM innovation, configuration & recommendations
9. How do you see learning and instruction being carried out in the future, post-COVID-19?	Hall & Hord's Change Theory Concerns Based Adoption Model (CBAM) Innovation Configuration	CBAM innovation, configuration & recommendations
10. What else would you like to share with me before we conclude our interview?	N/A	Shared experience Nonshared experience Direct quotes Chief

APPENDIX E:
DIRECTORS FOCUS GROUP QUESTIONS FOR POSSIBLE FURTHER RESEARCH

Questions to be asked in the *focus group* include:

1. Tell me your name, which program you direct, and which hospital site you are located.
2. Did your internal medicine program transition to remote learning due to COVID-19?
    a. If so, how early on was this transition made?
3. As an instructor, what benefits did you find in the transition?
    a. What challenges did you find in the transition?
4. What methods are being employed in teaching, instruction, and lecture currently?
    a. Do you plan on transitioning back to face-to-face learning? Why or why not?
5. Are there any needs or aspects of this transition that would warrant further investigation during my conducted research? If so, what are they?
6. What else would you like to share with me before we conclude our meeting?

APPENDIX F:
RESEARCH & INTERVIEW QUESTION CORRELATION FOR FURTHER RESEARCH

Research Question	Interview Question for Program Director Focus Group
1. How do disaster relief plans within graduate medical education programs respond to medical resident needs?	Prior to COVID-19, did your institution, program, and curriculum have a disaster relief plan in place regarding the education and learning of the trainees? If so, what did it consist of, and how did it respond to medical resident needs? Post COVID-19, what, if any, changes would you make to improve the disaster relief plan and/or address medical resident needs, especially educationally?
2. What were the experiences of internal medicine medical residents during their instructional switch to remote learning due to COVID-19?	Did you notice any feedback from your trainees regarding the switch to online learning, and if so, what feedback was given? As an instructor, what benefits, if any, and/or challenges, if any, did you find in the transition to online learning?
3. What shared and non-shared experiences, if any, existed between the residents? In what ways, if any, can the findings be utilized to improve the overall curriculum and policy development around disaster issues concerning graduate medical education for institutions of higher education?	Do you believe there will be shared experiences between the residents across the three hospital sites? If so, what would they be? Are there any needs or aspects of this transition that would warrant further investigation during my conducted research? If so, what are they? What do you hope to learn from the findings of this study?

APPENDIX G:
PARTICIPANT INVITATION EMAIL TEMPLATES

Rivera-Velazquez Invitation Email

Internal Medicine resident COVID Research Study Recruitment Email to Program Coordinator

Internal Medicine Program Coordinators,

I hope this message finds you well. I am currently a doctoral candidate beginning my research on the remote learning during COVID-19 on the internal medicine residents' education. I want to learn about the experiences of medical residents who were medical residents during the beginning of the COVID-19 pandemic (Spring 2020) while education was being held remotely.

If you could please forward this participation e-mail to your senior residents who would have been in training, or any chief residents or medical fellows who were internal medicine residents at the time, it would be much appreciated. I am hoping to obtain a maximum of 12 participants, ideally 3 per hospital site. They would be volunteering for an interview with me lasting approximately 90 minutes, no more than two hours. The interview would be confidential.

Please pass this along to your trainees. Thank you in advance for your help and assistance.

Respectfully,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

Internal Medicine resident COVID Research Study Participant Invitation Email

Medical Resident,

It is hard to believe that it has already been two years since the beginning of the COVID-19 pandemic during Spring 2020! I would like to learn about your experiences during the transition to remote learning during that time.

You are invited to take part in a research study.

I am doing an interview study to understand the lived experience of internal medicine medical residents, and your education due to the rapid shift to remote learning as a result of the COVID-19 pandemic. Your experience is valuable as understanding it may help in developing recommendations in improvements to the faculty for future crises.

I would like to collect your experiences in an interview over Zoom that will take approximately an hour and a half. The interview will be recorded for data analysis. A pseudonym will be utilized instead of personally identifiable information. Your answers will also be kept confidential

Participants must be 18 years of age or older and must have been an internal medicine medical resident during the beginning of the COVID-19 pandemic, when education shifted online.

If you are willing to participate, please let me know with a reply to this email and indicate if one of the following days/times would work for your interview. If one of these days/times does not work, please send me an email with when you are generally available, and we will find something that works to accommodate your schedule as a medial physician.

[Insert day and time options]

Attached is a UCF document [HRP 254 Explanation of Research form] with further information.

Respectfully,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

Internal Medicine resident COVID Research Study Confirmation email, Zoom link

Dear [add name here],

Thank you for agreeing to participate in my research. I look forward to learning about your experience during our upcoming interview.

I look forward to seeing you on [date] and [time]. Here is the zoom link for the interview.

[add Zoom link here also send them an Outlook zoom appointment and categorize it as 'private']

Sincerely,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

Internal Medicine resident COVID Research Study Reminder Email

Dear medical resident**,**

This is a reminder that I have not heard back from you regarding scheduling an interview for my research on the lived experience of internal medicine medical residents' education during the shift to remote learning due to the COVID-19 pandemic.

Participation will take about an hour and a half of your time. If you are still interested in participating, please see my previous email for the details, then let me know by replying to this email. Thank you and have a great rest of the day.

Respectfully,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

Email for Not Selected Volunteer

Dear Medical Resident,

Thank you for expressing interest in taking part in my research study on the lived experience of internal medicine medical residents' education during the shift to remote learning due to the COVID-19 pandemic.

At this time, I already have the required number of participants to run the study. If something should change, I will definitely let you know. Thank you again and have a great rest of the day.

Respectfully,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

Thank you for participating email

Dear Medical Resident,

I just want to thank you again for participating in my study. I enjoyed getting to know you and your experiences in the shift to remote learning during the COVID-19 pandemic. Once I complete my study, I will be happy to share the results. Thank you and have a great rest of the day.

Respectfully,

Stephanie M. Rivera-Velazquez
GME Institutional Coordinator
UCF Doctoral Candidate
Stephanie.Marie.Rivera.Velazquez@knights.ucf.edu
[cell phone number]

APPENDIX H:
IRB HUMAN SUBJECTS PERMISSION LETTER

UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA00000351
IRB00001138, IRB00012110
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

March 11, 2022

Dear Stephanie Rivera-Velazquez:

On 3/11/2022, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Initial Study
Title:	REMOTE LEARNING DURING COVID-19 ON INTERNAL MEDICINE RESIDENTS' EDUCATION: BARRIERS AND ENHANCEMENTS THROUGH LIVED EXPERIENCES
Investigator:	Stephanie Rivera-Velazquez
IRB ID:	STUDY00003752
Funding:	None
Grant ID:	None
Documents Reviewed:	• HRP 251 Review, Category: Faculty Research Approval; • Dissertation Proposal Approval, Category: Other; • HRP 254 Explanation of Research, Category: Consent Form; • HRP 255 Form, Category: IRB Protocol; • Interview Questions, Category: Interview / Focus Questions; • Invitation E-mail, Category: Recruitment Materials; • Zoom BAA HIPAA Option, Category: Other; • Zoom ISO Certificate, Category: Other;

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Gillian Bernal
Designated Reviewer

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