

Conceptualizing University Students' Responses to COVID-19: Investigating Race/Ethnicity, Crisis, Mental Health, and Science Literacy

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Abstract

COVID-19 has adversely affected helping professionals, causing a rise in anxiety and effects on mental health as people are inundated with scientific information at unprecedented rates. Universities have made extensive changes, which often affect Students of Color disproportionately. Human Services Learners (HSLs) expressed increased professional stressors, while Teacher Education Learners (TEs) leaned on science authority. Students of Color reported lower effects on mental health than their White peers and more wellness strategies. We investigated undergraduate students' conceptualizations and engagement with COVID-19 connected to professional identity and race/ethnicity, further exploring how students are thinking about their personal mental/physical health with respect to science.

Keywords: COVID-19, mental health, human services learners, science literacy

Introduction

COVID-19 has had wide and varying effects internationally, often disproportionately affecting vulnerable populations (Lu et al., 2020; Sharma et al., 2020) while causing increased anxiety (Xiao et al., 2020) and exacerbating mental health issues (Druss, 2020). Additional challenges around science literacy are also growing as COVID-19 highlights inequities within science education (Huerta et al., 2021; Thomas & Rogers, 2020; Verma et al., 2020), disproportionately affecting Students of Color. We investigated these intersections by providing evidence of how students in helping professions (e.g., human services professionals [HSPs], counselors, teachers) experienced and conceptualized COVID-19, with a particular focus on Students of Color, who are often excessively burdened with challenges noted above.

The COVID-19 global pandemic has led to an urgent need for mental health support due to increases in depressed mood, anxiety, and stress (Drouin et al., 2020; Durankus & Aksu, 2022; Keeter, 2020). Helping professionals at the frontline of client and student care have been affected on multiple levels during the pandemic. The pandemic has led to helping professionals exhibiting increased symptoms of anxiety, depression, and stress (Lu et al., 2020; Wilson et al., 2020). Given their roles within community engagement, HSPs are often among the first people an individual interacts with during a health crisis (Dice et al., 2018). Teacher educators and preservice teachers also find themselves affected by COVID-19 (e.g., pivoting between online/hybrid instruction, acting as the only point of communication between families and schools), with increased workloads (Allen et al., 2020) and anxiety (Roman, 2020).

People of Color have been particularly affected by COVID-19, with increased anxiety and mental health stress, especially populations living in low-income, high-density geographical areas (Fitzpatrick et al., 2020; Ku & Brantly, 2020; Ruiz et al., 2020). This anxiety has been compounded by systemically racist policies in COVID-19 treatment practices. For example, Khazanhi et al. (2020) noted "historic racial segregation and their



inextricable downstream effects on the differential quality and distribution of housing, transportation, economic opportunity, education, food, air quality, health care, and beyond” as factors that disproportionately affect People of Color (p. 1). Black and Asian adults have experienced higher incidents of racial discrimination, with 4 in 10 adults reporting implicit racism since the pandemic began (Ruiz et al., 2020). These already present disparities have continued to widen during COVID-19 within multiple underserved intersectional identities affected by education, social class, health, socioeconomic status, and immigration status (Fitzpatrick et al., 2020; Ku & Brantly, 2020).

COVID-19 has also affected and inundated people with daily science interactions (e.g., Centers for Disease Control and Prevention [CDC] updates, news reports). Science, as a human construct, is susceptible to social and societal pressure; yet the process allows for consistency, replicability, and reliability leading towards “facts” (Verma et al., 2020). We define science literacy as people’s ability to understand science’s role within civic and cultural affairs and the use of science processes and concepts in their decision-making (American Association for the Advancement of Science, 1994). For example, while washing hands is an important facet of COVID-19 reduction, it is also essential to preventing the general spread of bacteria and viruses. As COVID-19 continues to affect communities, it is vital for helping professions to leverage science education to foster growth and appropriate, scientifically grounded behaviors toward becoming more science literate (Dahl et al., 2021; Thomas & Rogers, 2020).

Anxiety as a Crisis Response of Mental Health

Crisis responses vary depending on the individual and can have a short- or long-term effect on mental health. For example, anxiety can occur situationally or be a diagnosable mental health disorder, depending on severity and time. Even though symptoms might not reach the criteria for a diagnosis, they could directly affect an individual’s wellbeing. An individual might experience situational anxiety as a response to a crisis. Situational anxiety can be rooted in systemic fear of a future anticipated event, and individuals might exhibit anxiety symptoms even outside of a crisis event (e.g., restlessness, difficulty concentrating, muscle tension, irritability, fatigue, sleep disturbance; American Psychiatric Association, 2013). During a pandemic, individual experiences can lead to increased anxiety, depressed mood, stress, or xenophobia (Drouin et al., 2020; Durankus & Aksu, 2022; Sorokowski et al., 2020).

Diagnosed anxiety disorders have been directly related to crisis as well. Taquet et al. (2021) examined individuals who had received a COVID-19 diagnosis and found that those who had not been diagnosed with a mental health disorder previously were more likely to receive one compared to other health diagnoses. Anxiety disorder was one of the most common diagnoses given to these individuals (Taquet et al., 2021). United States adults were more than 3 times more likely to be diagnosed with depression or anxiety disorders in April/May of 2020 compared to pre-pandemic rates (Twenge & Joiner, 2020). Additionally, Asians and Asian Americans have seen an increase in racial discrimination during COVID-19, which has led to an increase in anxiety symptoms (Lee & Waters, 2021).

Mirroring other adult populations, university students in the United States have also experienced increased negative effects on mental health, including increased anxiety and depression due to COVID-19 (Browning et al., 2021; Son et al., 2020, Wang et al., 2020). Son et al. (2020) found academic stressors and isolation contributing to mental health stress. Wang et al. (2020) examined anxiety, depression, and suicidal thoughts among university students and found many participants had moderate to severe levels of depression (48.14%) and anxiety (38.48%). Additionally, 18.04% of the participants reported suicidal thoughts.



Wellness strategies were found to be a protective factor in decreasing the negative effects of COVID-19 on mental health (Son et al., 2020).

Understanding the effects of the COVID-19 crisis on race/ethnicity, mental health, and science literacy is vital as HSPs navigate this pandemic. Given these contexts, it becomes imperative to ask the question: How do students' professional identity and race/ethnicity mediate their conceptualizations around the COVID-19 crisis, mental health, and science literacy?

Method

Using a multiple case study method (Yin, 2014), we explored how selected undergraduate students experienced COVID-19 and mediated mental health effects and science ideas. We intentionally sought qualitative responses to provide nuanced, concrete, and contextualized examples currently absent in the literature of students' conceptions around COVID-19. The qualitative data were used to capture a holistic view of the pandemic's effects on student mental health by giving participants space to reflect on their experiences. The qualitative methodology allowed for a deep and rich descriptive quality (Creswell & Poth, 2017; Hays & Singh, 2012).

Participants & Context

Participants in this study were enrolled in a college of education at a large southwestern public university in an urban area. This university was designated both a Minority-Serving and Hispanic-Serving Institution by federal guidelines. The college houses programs dedicated to Human Services and Teacher Preparation, along with myriad other programming, and is one of the largest providers of both fields in the state.

Participants in the study were recruited from the end of Fall 2020 through the beginning of Spring 2021 using a homogeneous purposeful sampling method. Those invited to participate in this study were students enrolled in a specific course type (e.g., education or human services) across the college. Students specifically taking human services and teacher education coursework were recruited by asking instructors and coordinators to distribute a survey invitation to their classes. There were no special recruitment efforts related to gender or race/ethnicity.

A total of 242 participants responded to the survey. Of those, 22 did not complete the survey with missing data determined to be missing at random. Seven participants did not provide their course enrollment information, making it difficult to classify their professional identities. We removed the incomplete and non-determinant professional identities, leaving a final sample of 213 participants. Table 1 illustrates the sample demographics. Participants were enrolled in coursework within the college and self-identified as taking either courses focused on human services ($n = 89$) or teacher preparation ($n = 124$) at both undergraduate and graduate levels ($N = 213$). We classified students enrolled in human services courses as Human Service Learners (HSLs) and students enrolled in teaching courses as Teacher Education Learners (TELs). Most students self-identified as female (82.2%); slightly more than half self-identified as Students of Color (51.6%).



Table 1*Demographic Breakdown of HSLs and TELs Gender and Race/Ethnicity*

Category	No. (%)	% HSL	% TEL
<i>Gender</i>			
Male	35 (16%)	4%	12%
Female	175 (82%)	37%	46%
Non-binary/Other	3 (1%)	<1%	<1%
<i>Race/Ethnicity</i>			
White	103 (48%)	35 (16%)	68 (32%)
Hispanic	56 (26%)	30 (14%)	26 (12%)
Asian	19 (9%)	7 (3%)	12 (6%)
Black/African American	20 (9%)	9 (4%)	11 (5%)
Multiple/Other	15 (7%)	8 (4%)	7 (3%)
Total Students of Color	110 (52%)	54 (25%)	56 (26%)

Note. HSL = Human Services Learner, TEL = Teacher Education Learner

Survey & Data

We used Qualtrics, an online survey platform, to build and distribute the survey to participants. The survey included demographic questions (e.g., age, gender, ethnicity, course enrollment) and open-ended response questions. Before distributing the survey, two students—one school psychology Ed.S. student; and one teacher education Ph.D. student—provided participant-rater feedback on the survey. Their input prompted helpful revisions (e.g., allowing participants the option to respond to questions of age and ethnicity).

Students answered three open-ended questions: (1) How, if at all, has the COVID-19 global pandemic had an impact on your personal mental health? (2) How, if at all, has the COVID-19 global pandemic impacted your ideas about science decision-making, and (3) What support systems or self-care have you (or will you) leverage to protect your mental health? These data were collected and cleaned to reflect participants' professional identity (i.e., TELs, HSLs), participant number, and race/ethnicity (i.e., White [W]; Students of Color [SoC]). Through these questions, students described their experiences during COVID-19.

Data Analysis

Our research leveraged the multiple case studies method (Yin, 2014), where each case is bound by professional identity (i.e., HSL, TEL) and race/ethnicity (i.e., White; Student of Color). We used a social constructivist paradigm to help guide open coding of participants' open-ended survey responses and MaxQDA as a qualitative coding tool. The two first authors coded the data after discussing researcher bias (e.g., experiences as counselor and teacher; personal COVID-19 effects) and looked across three open-ended questions as source materials. The research team grounded their perceptions of student experiences by referencing the question every 20 entries. Further, coding authors also recorded the incident of saturation and continued coding an additional 25% of the data past that moment. Coders used full sentence codes for reference and inclusion of ideas.

Strategies for Trustworthiness. Multiple approaches were used to meet several criteria of trustworthiness (i.e., credibility, transferability, confirmability, authenticity, coherence, sampling adequacy, and substantive validation; Hays & Singh, 2012; Lincoln &



Guba, 1985). The research team employed the following specific strategies: (a) use of an audit trail; (b) triangulation of data sources (i.e., qualitative and quantitative responses), investigators, and theoretical perspectives (i.e., interdisciplinary research team); and (c) thick description.

Findings

We asked, “How do students’ professional identity and race/ethnicity mediate their conceptualizations around the COVID-19 crisis, mental health, and science literacy?” We identified two themes and six sub-themes during our qualitative analysis.

Theme 1. Instigating Factors Affecting Students’ Mental Health

Theme 1 refers to instigating factors that affected student mental health; it has four subthemes: (1) Individual mental health, (2) Isolation, (3) Professional stressors, and (4) Science infused awareness and reflection about COVID-19.

Individual Mental Health. All students across professional identity and race/ethnicity reported various effects on their mental health from the pandemic, most explicitly noting increased anxiety, depression, and fear. One HSL participant spoke about the effects of COVID-19 overall, saying,

COVID-19 has negatively affected my mental health. I struggle with depression and anxiety and the emergence of the pandemic has made my symptoms worse... But I would say that I’ve experienced more bouts of depression, worry, anxiety, hopelessness, panic, and numbness than I’ve ever had in 1 year before.

Additionally, students often noted a wide range of emotions at once while answering the questions, indicating how complicated feelings were related to the pandemic. For example, one HSL participant stated,

I was experiencing high levels of anxiety, fear, and numbness. I would ping pong between feeling like it’s going to be okay, and then feeling dread and overwhelm, and then feeling numb, and back again—usually all in 1 day!

Anxiety was experienced across groups, but further parsing of the data showed that anxiety was reported more often by HSLs. The following are three examples of HSLs experiencing anxiety: (1) “I have felt very anxious and alone during this time”; (2) “COVID-19 pandemic has impact[ed] my personal mental health, I feel more anxious and worried most of the time because COVID-19 is out there and no one is basically safe”; and (3) “I feel increased anxiety when going out in public because of the virus. I feel like I have less motivation to get things done from home.”

Depression was also reported across groups, but examining the data helped identify HSL Students of Color students having a much higher instance of depression than other groups. For example, one participant stated that, “As of recently I feel that the pandemic has had a negative impact on my mental wellbeing. I have stopped reaching out to my support and care less about completing school.”

Many participants experienced fear of COVID-19 (e.g., health-related); this was more prominent among HSL and TEL Students of Color. One TEL participant shared: “my anxiety and mental state has suffered. I’m almost terrified to go outside and be around people outside of my household... There are times when my anxiety causes me to stay in my room.”

A small subset of the participants in this study reported happiness related to the pandemic, often associated with spending time with others. For example, one HSL wrote, “I feel happy to be able to be home with my family, especially to see my 1yr old daughter grow.”

Isolation. Many students across professional identity and race/ethnicity reported isolation as an effect on their mental health. Isolation was reported for many reasons (e.g.,



living alone, not being able to see friends, having to stay home, limited interaction with others). This lack of connection to others was a significant barrier to positive mental health practices. Although isolation was mentioned across all groups, TELs across race/ethnicity were more affected by isolation, reporting decreased mental health related to not connecting with others. One HSL participant said, “I have spent much less time with family and friends...which has had a huge impact on my mental health...made me feel depressed.” Similarly, one TEL participant shared,

I don’t spend as much time with family or friends since COVID-19...[I’ve] really isolated myself during this time. I think that being forced to isolate for so many months has just carried on as the quarantine restrictions have lifted.

Another HSL participant shared, “I have been closed off from a lot of my friends and have felt like [I’m] holding myself back from growth.” A TEL participant wrote, “When quarantine first began, I felt very lonely and isolated since I couldn’t see my friends. Since I wasn’t interacting with people nearly as much, I felt my social anxiety worsen significantly when leaving my house.”

Professional Stressors. Many students noted education and work stressors compounded by COVID-19 and included topics such as job loss, financial stress, changes in work/education environment, and pressure related to professional expectations. Specifically, Students of Color were more affected by these professional stressors, with HSL students feeling the most affected by job loss and financial stress. Examples from HSL students include the following: “COVID-19 has placed a significant financial burden on me and my family and has therefore had an impact on my daily anxiety”; “Currently, due to lack of work, my finances have been challenged, which has affected my mental wellbeing intensely”; and “I lost my job and all my classes moved online and the lack of socialization made me more depressed.” Finally, only female Students of Color across both professional identities reported having to resign from work to be full-time caretakers of their children; one of these participants shared, “I’m limited from working because I don’t have a sitter or daycare option, so I’m stressed about having study time and financially as well.”

Science Infused Awareness and Reflection About COVID-19. When students were asked to reflect on their understanding of science and COVID-19, awareness and frustration were two major themes that emerged. First, TELs were more trusting of science authority and expressed more frustration with science and COVID-19 than HSLs. Interestingly, HSPs of Color and White TELs were the most reflective of how science had influenced their actions.

Both groups referenced science authority (e.g., scientists, doctors, CDC); TELs brought in the idea of authority almost twice as often as HSLs. In the following passage, one TEL participant explains their current reasoning around science:

I have been hearing a lot of information that I feel is not true, I don’t feel any urgency to go into depth on researching the virus. I jus [*sic*] listen to the CDC guidelines and try to keep myself, my family, boyfriend, and the people around me safe by not doing anything dumb.

In general, TELs trusted the CDC as a reliable source of information and did not feel the need to delve deeper into scientific topics. Interestingly, White learners (both HSLs and TELs) were more likely to mention distrust for science concerning media-based authority. Regarding this distrust, one White HSL stated, “There was a lot of uncertainty with COVID-19 and so much false news going around the media. Because of all this false news and uncertainty, I questioned a lot about my ideas about science (e.g., wearing masks, gloves, hand sanitizer).”

Theme 2. Supportive Factors Impacting Students’ Mental Health



Theme 2 refers to supportive factors related to student mental health and has two subthemes: (1) Wellness strategies and (2) Science influenced behaviors about COVID-19.

Wellness Strategies. Wellness of participants referred to personal choices made to reduce the effects of the pandemic on their individual mental health and was centered around two distinct areas: self-care practices (e.g., exercising, hobbies, being outdoors) and mental health support (e.g., seeing a counselor; medication compliance; interaction with family, friends, and pets).

Many participants noted personally completing self-care activities. Students of Color mentioned more types of self-care that they were engaging in compared to their White counterparts. Hobbies and spending time outdoors were reported more frequently by Students of Color across professional identity; for example, one HSL stated:

I do my best to go outside at least once per day. I exercise, meditate, and do yoga...doing something comforting at home, like watching a movie in pjs or having coffee and co-working. I want to start seeing a therapist, but since I'm unemployed, the financial burden has been a barrier for me. When I'm particularly overwhelmed or feeling burnout, I know to spend time with a close friend or family member that will snuggle me, and I seek out opportunities to laugh.

Some participants reported engaging in mental health support with others. HSL students across race/ethnicity reported seeing a counselor and complying with medication; for example, one HSL participant stated, "To care for my mental health, I am in therapy, and I take medications." Across all participants, interaction with others (i.e., friends, family, pets) was seen as an effective wellness strategy. One TEL participant wrote, "The support systems that I am utilizing involve[s] talking to my family members...contact with my friends, and [I] love getting social interaction with my co-workers at my part-time job."

Participants did not see all family/friend interactions as positive. For example, one TEL participant said, "Even though I am spending more time with family that I am happy of, during this pandemic, I can't help but feel like our relationship is getting worse and it's stressing for me to stay in the house."

Science Influenced Behaviors Pertaining to COVID-19. Participants were asked to consider how science had influenced their day-to-day actions and behaviors. Students across groups documented instances of change linked to science, primarily around hygiene (e.g., washing hands, sanitizing, social distancing) and mask-wearing. TELs tended to trust science authorities (e.g., CDC) to handle and deal with issues and anxiety around COVID-19. Students of Color documented more types of additive behavior and often included links to family/community actions. One HSL Student of Color wrote:

I like following some doctors on social media who are able to interpret the science...use the information and recommendations from the CDC and [World Health Organization] to make choices about what I'm going to do in my daily life...hand sanitizer before and after I touch anything that's not inside my house, I wear a mask whenever I'm in public or with clients, and I get a COVID test and quarantine anytime I feel even just a little bit under the weather.

While focused on general hygiene, this participant also included additional behaviors like following doctors on social media and considering client needs by wearing a mask. When looking across all four groups (i.e., TEL/HSL, White/Student of Color), HSL Students of Color were most likely to change their behaviors based on COVID-19.

Discussion & Implications

HSLs descriptively reported increased effects on mental health compared to TELs and had more instances of professional stressors. There could be two reasons for this. First,



during a pandemic, HSLs might work in professional settings where they interact with more individuals experiencing depression, anxiety, and stress (Dice et al., 2018). Second, HSLs might have more training in areas that develop more language and skills related to emotions and feelings. Specifically, HSLs have lessons in helping skills (i.e., attending, listening, reflecting) integrated throughout their coursework (Council for Standards in Human Service Education, 2020). Since HSLs might have used techniques such as feelings sentence stems in their coursework, the open-ended questions asking participants for “I feel” statements might have been easier for them compared to their TEL peers.

Given that all participants in the study expressed greater needs and challenges within the context of COVID-19, implications for HSPs include being given leeway and support, assuming that client needs will increase during and after the crisis. During global, national, and state-level crisis situations, HSPs will need additional support, training, funding, and resources to adequately meet clients’ needs with growing challenges. Finally, HSPs should employ wellness practices to manage their own mental health when working with clients who are experiencing increased mental health challenges.

TEs reported overall lower effects on mental health than HSLs and deferred to science authority more often, while questioning media authority. TEs were offsetting the responsibility (and perhaps also feelings of anxiety) on an authority figure to *take care of* COVID-19.

These findings align with previous research indicating that helping professions overall are experiencing anxiety, uncertainty, and change in higher amounts due to COVID-19 (Allen et al., 2020; Lu et al., 2020; Wilson et al., 2020). However, TEs’ defaulting to authority could either be positive or negative depending on students’ underlying understanding of the science process and expertise (Verma et al., 2020). Interestingly, both groups of students self-disclosed evidence that their ideas of science did influence their decision-making skills. There were many instances of COVID-19 increased students’ science-driven behaviors aligned with science literacy (American Association for the Advancement of Science, 1994). This finding suggests that students in helping professions need more targeted education and access to science literacy (Verma et al., 2020), not just health literacy materials. This would support HSPs and teachers to engage their clients and students’ stronger science-based discussion making.

In terms of race/ethnicity, Students of Color descriptively reported lower effects on mental health overall and reported more instances of wellness strategies. This is similar to a finding by Browning et al. (2021) that those who engaged in wellness practices reported fewer negative effects on mental health. It is possible People of Color experience multiple forms of trauma (e.g., historical, racialized) that might affect how they perceive typically higher anxiety events. Considering intersectional identities, while a White individual might experience COVID-19 as a single event or trauma, a Person of Color might experience COVID-19 compounded by higher incidents of implicit racism, racialized trauma, and healthcare inconsistency (Khazanchi et al., 2020; Ruiz et al., 2020).

Implications for HSPs include providing more training and guidance on working with diverse clients with intersecting identities, particularly race/ethnicity. HSPs need to be trained and attuned to address racialized and historical trauma experienced by People of Color, as well as understanding and engaging in the different ways individuals engage with emotions and decision-making. It is vital that HSPs account for a more extensive breadth of feelings to capture the more nuanced, holistic experiences of clients, particularly for People of Color. This includes valuing various wellness practices (e.g., connections with others, being outside, exercise) that support mental health during crisis.



Future Research Directions & Limitations

Future research directions could include more holistic mental health assessment, accounting for other influences on mental health (e.g., depression, stress). Additionally, instruments that measure HSPs' current competency working with clients experiencing crisis events (e.g., suicide) are vital to better understand training needs. Finally, work integrating science and science literacy within human services and teaching contexts would allow for active planning and protection and help mitigate future crisis scenarios.

There are limitations to this study, including the grouping of all Students of Color as a population. Because we grouped all Students of Color together, we missed individual group nuances that might not adequately address needs within each race/ethnicity. Additionally, the survey might have not adequately accounted for the wide range of feelings and emotions within groups (e.g., depression, fear, anger, loneliness), particularly with Students of Color. Traditional interviews might have allowed us to probe for deeper and richer responses. However, this survey provided an opportunity for a breadth of responses from a wide range of participant voices.

Conclusion

As the effects of COVID-19 linger within educational communities, it is important to continue investigating and monitoring how the pandemic has affected populations of helping professionals—particularly within populations that are disproportionately affected (e.g., People of Color). This study provided evidence of the resilience of students to cope, adapt, and overcome egregious challenges (e.g., personal crisis, effects on mental health) in the face of a pandemic and the role science can play within their actions and decision-making. We used multiple case studies to investigate and contextualize an international health crisis, shedding light on a situation HSPs are experiencing, which is simultaneously ubiquitous and unique.

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