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COVID-19 outbreak impact on the wellbeing of migrants in U.S. college towns: The Case of Gainesville, Florida

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Abstract

A major characteristic of U.S. college towns is the continuous influx of migrants who come to study and work under a visa. Unfortunately, these groups are underrepresented in pandemic and disaster studies. Migrants can be more vulnerable in the face of pandemics due to the limited access to resources, cultural differences, and social discrimination. The main goal of our study is to help close this research gap by answering the following research questions: How did the COVID-19 outbreak impact the wellbeing of migrants in Gainesville, Florida? And how did the changes in visa regulations and deportation threats during the COVID-19 outbreak affect the anxiety and depression levels among migrants in Gainesville, Florida? The data was collected through a mixed-methods approach. This involved semi-structured interviews with eleven migrants from Gainesville. Following the interviews, we conducted a cross-sectional survey based on previously validated depression and anxiety questionnaire tools (PHQ-9 and GAD-7), and it was completed by 165 migrants from Gainesville. Three main themes resulted from the qualitative analysis of the interviews; 1) Emotional struggles and socioeconomic challenges, 2) Discrimination and lack of government and institutional support, and 3) Communication challenges. Simultaneously, due to the visa changes, the survey sample had mild to moderate depression and anxiety levels on average based on the PHQ-9 and GAD-7 scales. Our findings offer practical policy insights which can help in developing effective and equitable pandemic and disaster risk-reduction strategies.

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1. Introduction

College towns are centers of political liberality as well as an academic, social, and cultural influence (Gumprecht, 2003). The economy of such communities is built around and supported by a university, which is typically the largest employer in that town. College towns are also dominated by the university's young population, who usually outnumber the local population (Gumprecht, 2006). All of that gives college towns a very unique socioeconomic structure that significantly influences how these communities respond to and recover from pandemics and disasters. The wide range of possible hazards in college towns makes risk mitigation and emergency planning more challenging (Kang, 2018). This is a major reason behind the poor performance of emergency offices in U.S. college towns (Boon et al., 2012). Due to the large young adult population, permeable boundaries, and high level of social contact, college towns have the potential to become centrifugal and explosive pandemic outbreak centers (Shearer et al., 2020). It is therefore essential in such places to promote positive behaviors with regard to public health amongst their young adults (McGuire, 2007).

While pandemic outbreak management is fundamental to reduce the impact on educational institutions and their surrounding communities (Morens et al., 2009), research conducted in several college towns in Florida showed considerable gaps in emergency planning and crisis management (Reed & Macuare, 2019; Simms, 2013). In this research, we cover some of these gaps by studying one of the underrepresented groups in disaster studies –migrants– evaluating the COVID-19 outbreak impact on their wellbeing in the U.S. In this study, we define *wellbeing* as the state of being comfortable, happy, and healthy (physically and mentally), and we define a *migrant* as a person living in a host country on a temporary basis, who is considered by the government as a nonresident alien and studies or works under one of the following visa types: F1, F2, M1, M2, J1, and J2 visas. This includes international students (and their dependents), doctors under medical residency and fellowships (and their dependents), and U.S. international graduates (and their dependents) who joined the workforces in the U.S. under the OPT (Optional Practical Training) employment program.

Migrants are usually overlooked in disaster research, especially in studies conducted in college towns (Gutierrez et al., 2005; Coleman, 2008). Moreover, current literature on the specific vulnerabilities of migrants in the face of pandemics is very limited (Thorup-Binger & Charania, 2019). Migrants can be more vulnerable in the face of pandemics due to the limited access to resources, inequality, cultural differences, language barriers, and most importantly, social discrimination (Abukhalaf & von Meding, 2021b). Our data collection sought to develop new knowledge about migrants at U.S. college towns during the COVID-19 outbreak to enhance overall crisis management practices and risk mitigation strategies. The main goal of our study is to answer the following research questions:

1. How did the COVID-19 outbreak impact the wellbeing of migrants in Gainesville, Florida?
2. How did the changes in visa regulations and deportation threats during the COVID-19 outbreak affect the anxiety and depression levels among migrants in Gainesville, Florida?

Migrants carry their unique stories with them, and when they go back to their home countries, usually their stories are lost and gone with them. By capturing the emotional challenges and hardships they faced during the COVID-19 outbreak, this study presents a significant opportunity to study culturally different groups who went through a serious life transition, and offers critical policy insights that help in their empowerment, and that enhances the overall crisis management practices and risk mitigation strategies in U.S. college towns.

2. Literature review

2.1. Social side effects of COVID-19 safety precaution

The COVID-19 outbreak was first reported in China, in December 2019 (WHO, 2020). The first U.S. coronavirus case was confirmed by the Centre for Disease Control and Prevention (CDC) on January 21th of 2020 in the state of Washington (CDC, 2020). The Trump administration declared public health emergency in the country on the 3ed of February (AJMC, 2020), and 37 days later, the World Health Organization (WHO) declared COVID-19 as a pandemic on March 11th, 2020 (WHO, 2020). To date, confirmed coronavirus cases in the U.S. have exceeded 99.8 million, and resulted in more than 1.1 million deaths nationwide (CDC, 2022).

CDC Reports showed from the beginning of the outbreak that the virus spreads through direct exposure to patients carrying the virus, or by contact with contaminated surfaces and objects (CDC, 2020). To reduce contact between people, major lockdowns took place in many cities around the country (BBC, 2020b), which helped manage the virus infection rates among people. However, the outbreak-related safety measures carried a significant social cost and had a severe impact on people's physical and mental health. The sudden lockdown and shutdown of services had unintended but severe consequences, such as creating a higher sense of loneliness, and increasing stress levels among the public in the U.S. (Algunmeeyn et al., 2020). Also, the rapid increase of cases, the lack of proper medical treatment in some states, and the spread of fake news, all contributed to creating a state of public panic (Cao et al., 2020). During such difficult times, fear spreads fast, the fear of getting sick or losing beloved ones, causing a wave of depression and anxiety among the public; however, this exponential increase in mental illnesses is usually overlooked (Zhai & Du, 2020).

On the other hand, the pandemic outbreak in the U.S. led to an outbreak of fear contributing to more social discrimination, or Xenophobia, against migrants and other ethnic groups (Shen-Berro & Yam, 2020). Xenophobia is defined as *prejudice against people coming from other countries* (Yakushko, 2009). Throughout history, it was common to associate migrants with contagions, as in 1832 when the Irish poor were blamed for the cholera outbreak, or in 2003 when the SARS outbreak was linked to people from China and led to travel bans and visa cancelations and denials (Shen-Berro & Yam, 2020). Xenophobia affects people's self-esteem and sense of belonging, and makes places like college towns feel dismal

and unsafe (Yakushko, 2009).

Previous research showed that some migrant groups have different behaviors during pandemic outbreaks, where they tend to take instructions more seriously at early phases of the contagion, such as using face masks (Van et al., 2010). This causes them to stand out and face additional racist stereotyping. In research conducted in Sydney, Australia, to measure responses and perceptions towards pandemics, 2882 college community members were surveyed. The results showed that Asian migrants were significantly more likely to believe that pandemics are serious compared to other subjects, and they are more likely to adopt simple health behaviors much faster than others (Van et al., 2010). Many migrants suffered from xenophobia and social exclusion during the SARS outbreak (Zhou & Yang, 2020). Similarly, discrimination against migrants was seen during the COVID-19 outbreak, and xenophobia built up in many college towns around the U.S. (Shen-Berro & Yam, 2020). Following the first reported cases of COVID-19 in China, many college towns in the U.S. canceled all social events related to Chinese New Year, while the virus outbreak was still thousands of miles away (Silva et al., 2020).

Moreover, during the COVID-19 outbreak, the virus was racialized through the dominance of misguided precautions and misinformation. This came in the form of insensitive and racial media stereotyping, such as promoting images of foreigners, especially Asians, wearing masks as part of updates about the coronavirus (Silva et al., 2020). Sometimes out of malice, but usually out of fear and ignorance, social media users circulated racist videos that targeted foreign cultures, and spread misleading information about their eating habits; the more fear and panic people face, the more temptation they have to blame the other, or in this case, all outsiders.

2.2. COVID-19 visa regulations and deportation threats

After declaring COVID-19 as a health pandemic (WHO, 2020), the U.S. issued a national health emergency declaration, and imposed travel restrictions to many countries that were affected by COVID-19 (AJMC, 2020). In the following days, most U.S. higher education institutions changed the in-person instructions to remote/virtual communication due to safety concerns for their students, staff, and faculties on campus (Martel, 2020). In order to support and continue student instruction during this period, education institutions offered a number of alternatives, including online tutoring, virtual office or advising hours, asynchronous learning options for students in other time zones, and altering the grading policies (Martel, 2020).

Based on the Immigration and Customs Enforcement (ICE) policy, international students typically are allowed to take only one online course per semester in order to maintain their legal status active (ICE, 2021). As the COVID-19 outbreak forced many U.S. universities to move to online instructions, the Student and Exchange Visitor Program (SEVP), which is run by ICE, made a temporary exemption to the aforementioned policy and allowed the international students to take multiple remote courses without affecting their visa status (Chin, 2020c). As a result, foreign students could continue spring and summer semesters of 2020 remotely while being in the U.S. However, the exemption didn't extend to the new academic year 2020/2021 (BBC, 2020c).

On July 6, 2020, ICE announced that international students must attend in-person classes to stay in the U.S., and if they

take a fully online course, they will be asked to leave the country (ICE, 2021). Moreover, current international students who already left the U.S. will not be permitted to reenter, and student visas will not be issued for new international students whose universities offer only online courses due to the pandemic. International students were shocked and stressed about their future in the country. For many international students, going back home was infeasible, expensive, and dangerous (Chin, 2020b).

Many international students were concerned about their budget and time, which could have been wasted if their status was canceled, or if they were compelled to do something which was not related to their course of study (BBC, 2020c). Many were worried about losing their scholarships or financial support from their universities if they could not get visas in time or were deported back to their home countries (Chin, 2020a). Even though the new visa regulations targeted international students, they were to affect the legal status of all nonstudent migrants under F1, F2, J1, J2, M1, and M2 visas. The decision of U.S. immigration authorities left the migrant communities in uncertainty, anxiety, and fear of an unclear future (BBC, 2020d).

Consequently, Harvard and the Massachusetts Institute of Technology filed a lawsuit, which was also signed by several other universities, to sue the immigration services over ICE's decision to withdraw visas of the international students (BBC, 2020e). The aim of the lawsuit was to overturn the enforcement of ICE's guidelines and actions, calling it capricious, arbitrary, and an abuse of discretion. The lawsuit argued that ICE's decisions regarding this subject did not show any consideration for the health of students, faculty, university staff, or their communities, which could throw U.S. college towns into chaos (BBC, 2020c).

After spreading a wave of stress and anxiety among the migrant communities, the ICE was forced to withdraw their decision under the pressure of institutions of higher education (BBC, 2020e). This proclamation was altered to permit migrants to continue learning and working online without fear of being deported for the fall semester of 2020; however, it increased the anxiety that was already being felt due to the Trump Administration's push against immigration and immigrants (ICE, 2021). Therapists even coined the new term, "Trump Anxiety Disorder" (Zogbi, 2018). These deep anxieties for migrants were renewed at the end of every semester as they waited for the ICE updates on the visa regulation.

One of the few empirical studies that measured depression and anxiety levels among migrants during the pandemic was conducted in the U.S., where international students from five different U.S. college towns participated in that study during the summer semester of 2020, right after the ICE announcement of changing visa regulations. In that study, 93% of participants reported mild to severe depression, and 95% reported mild to severe anxiety (Maleku et al., 2021). These reported levels of depression and anxiety among international students in the U.S. are much higher than those for U.S. domestic students and other college students around the world. During the pandemic, 50.3% of the domestic students in the U.S. reported mild to severe depression and 41.3% reported mild to severe anxiety (Rudenstine et al., 2021). Another study combined data of 89 different studies from 27 countries. 34% of students around the world reported mild to severe depression, and 32% reported mild to severe anxiety (Deng et al., 2021). Nevertheless, there is a lack of empirical research that tracks the pandemic impact on migrants around the world (Ehmke et al., 2022), and our study is meant to

help in filling that gap in the literature.

3. Research method

In this study, we utilized a mixed-methods approach for data collection and analysis. This involved semi-structured interviews with migrants from Gainesville, Florida. Following the interviews, we conducted a cross-sectional survey, which was also completed by migrants from Gainesville.

3.1. Study location and recruitment

Gainesville was chosen to be the location of this study because of the continuous influx and high presence of migrants to the region (University of Florida, 2021), and building on previous studies on migrants in this college town. Gainesville is the homeland of University of Florida (UF) main campus. It is one of the biggest campuses in the southern part of the U.S., with almost 16,000 staff members, 56,000 students, and 1,000 buildings owned by the university (University of Florida, 2021).

The interviewees' recruitment was achieved by advertising the study online through the UF Center of International Services (UFCIS). The data collection focused on the quality rather than the quantity of the interviews, and it continued until data saturation was achieved. Individuals interested in participation in our study were accepted only after meeting the inclusion criteria; fluent in English, 18 years old or older, having lived in Gainesville during the year 2020 under F1, F2, J1, J2, M1, or M2 visa. This included UF international students (and their dependents), doctors under UF medical residency and fellowships (and their dependents), and UF international graduates (and their dependents) who joined the workforces in the U.S. under the OPT (Optional Practical Training) employment program. Twelve participants reached out to us, but only eleven met the inclusion criteria. The other one moved to Gainesville in January 2021.

Based on a preliminary analysis of the interviews, we noticed that visa changes during the outbreak had a great impact on the mental health of the migrant community in Gainesville. As a result, we developed an online survey through the UF *Qualtrics* software based on the review of critical literature. The choice was made to conduct the survey in an online format to achieve a higher response rate, and to have more flexibility, especially with the restrictions levied on proximal contact by the pandemic. The online survey also allowed us to minimize bias toward age, gender, and country of origin, and achieve a higher level of diversity within the study sample. The survey inclusion criteria were the same as for the interviews. With no incentives provided for participants to take the survey, the survey web-link was sent out once via emails to migrants in Gainesville through the UFCIS, and we left the survey open for 14 days to ensure enough time was given for participation.

3.2. Data collection

One-on-One semi-structured interviews were conducted online through *Zoom* during June & July 2021. Interviewees were

asked to reflect on their struggles during the pandemic, and the duration of each interview ranged from 25 to 50 minutes (see interview questions in Appendix A). Representative quotes from the participants were used with pseudonyms to protect the confidentiality of participants (see Appendix C). To ensure the interview questions and guides addressed the study's aim, they were first informed through academic literature, and later we conducted a Subject Matter Expert's Validation (SMEV) (Fellows & Liu, 2015). In the SMEV, two expert academics from our available networks were chosen based on their experience in similar research topics to review the interview questions. After integrating the experts' comments, the interview questions were pilot tested on two migrants for improved clarity. The two migrants had to satisfy the same inclusion criteria as the other interviewees.

To ensure an adequate sample size for the participants in the survey, a confidence level of 95% and a margin of error of 10% were taken into consideration to determine the minimum sample size; 97 survey responses. The survey was constructed based on academic literature (Fellows & Liu, 2015), and it was pilot tested on eleven migrants; the same ones who participated in the interviews (see Appendix B for pilot testing results). As a result, two questions were revised for improved clarity. The modified questionnaire included eleven questions, and ten sub-questions, divided into three main sections; demographics (see Table 1), depression screening, and anxiety disorder screening (see Tables IV and V in Appendix D). The survey questions were based on common assessment scales that had been previously validated in the medical field: the Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder (GAD-7) (Yoon et al., 2014; Maurer et al., 2018).

After the development of the Diagnostic Statistical Manual of Mental Disorders (DSM) in 1952, depression and anxiety scale questionnaires, such as PHQ-9 and GAD-7, were produced for assessing and monitoring the level of depression and/or anxiety severity (Spitzer et al., 1999). These screening tools cover a wide range of symptoms, such as trouble concentrating, losing interest, trouble sleeping, changes in eating habits, and many others (see Tables IV and V in Appendix D). Such screening tools assist practitioner diagnoses and act as a symptom tracking tool for a patient's depression level and treatment (Spitzer et al., 2006). For researchers, these scales help to compare and contrast subgroups of individuals, their depression/anxiety symptoms, and the varying reason (s) for this emotional unrest.

The PHQ-9 and GAD-7 questions in the survey started with "When you were told about the ICE changes of visa regulations, how often have you experienced any of the following problems?" The questionnaires took five minutes on average to be completed. The free-response answer format was used only in the Demographics section, and it was left out of the other sections to limit confusion. The Likert scale was the main format for the questions in the depression and anxiety disorder screening sections. All the participants in the study were asked to provide consent based on the UF and ISRA informed consent protocols, knowing that no identifiable was collected during any phase of the study. The ethical approvals for our study were obtained by the Institutional Review Board at UF and ISRA, reference numbers IRB202101003 and SREC/2I1A71010.

3.3. Data analysis

The data collected from the interviews were thematically analyzed. The process involved a combination of deductive and

inductive coding, and codes were informed by participants and pre-existing theories in crisis management and mental health. Data analysis involved continuous creation and reflection on themes, making it an iterative process (Fellows & Liu, 2015). We conducted an Inter-Rater Reliability (IRR) to check and establish agreement on the themes. The final themes formed were peer-reviewed and validated by two academic experts outside the coding team. These two experts were the same who participated in the SMEV.

As mentioned before, the questionnaire was based on standard assessment scales. The PHQ-9 scale consists of nine questions given to participants in order to screen for the presence of severe depression (see Table 4). Similarly, the GAD-7 scale consists of seven questions given to participants to screen for anxiety disorder (see Table 5). Using a 4-point Likert scale in both instruments, participants' responses ranged from 0.0 to 3.0, where 3.0 means “Nearly every day” and 0.0 means “Not at all”. Since the PHQ-9 instrument includes nine questions, and the maximum score for each question is 3, resulting in a total score from 0.0 to 27.0. A total score of 20.0–27.0 indicates severe depression, 15.0–19.0 moderately severe depression, 10.0–14.0 moderate depression, 5.0–9.0 mild depression, and 0.0–4.0 minimal depression (Maurer et al., 2018). On the other hand, the GAD-7 instrument includes seven questions, and the maximum score for each question is 3 as well, resulting in a total score from 0.0 to 21.0. A total score of 15.0–21.0 indicates severe anxiety, 10.0–14.0 moderate anxiety, 5.0–9.0 mild anxiety, and 0.0–4.0 minimal anxiety (Esser et al., 2018).

We analyzed the collected data from the surveys using SPSS software packages, version 26. Following leading research papers on mental health during the pandemic (Naser et al., 2021; Varghese et al., 2021), different statistical approaches, including ANOVA, Independent Sample t-Test, and Binary Logistic Regression, were used to quantify variables and uncover patterns through usable statistics based on generating numerical data, in order to generalize the findings to the migrants’ community in Gainesville (Fellows & Liu, 2015). Two-dimensional demographic analyses were not considered in this paper; instead, the survey responses were analyzed along each demographic, such as age and gender, separately to keep the scope achievable in one research paper.

4. Results

4.1. Interviews

A total of eleven participants from nine different countries were interviewed, and their demographic characteristics are presented in (Table 1). The age range of the participants was 24 to 37 years, and their time of stay in Florida ranged from three to eleven years at the time they were interviewed. The data analysis yielded three main themes; 1) Emotional struggles and socioeconomic challenges, 2) Discrimination and lack of government and institutional support, and 3) Communication challenges. (See Table III in Appendix C)

Table 1. Study participants’ demographic characteristics

Interviews (*N=11*)			Survey (*N=165*)	
	Frequency (%)			**Frequency (%)**
Gender Identity			**Gender Identity**	
▪ Male	6 (54.5%)		▪ Male	86 (52.1%)
▪ Female	5 (45.5%)		▪ Female	77 (46.7%)
▪ Other or prefer not to say	0 (0.0%)		▪ Other or prefer not to say	2 (1.2%)
Country of origin			**Region**	
▪ China	2 (18.2%)		▪ Africa	13 (7.9%)
▪ India	2 (18.2%)		▪ Asia (Far East)	48 (29.1%)
▪ Brazil	1 (9.1%)		▪ Europe and Canada	16 (9.7%)
▪ Iran	1 (9.1%)		▪ Latin America	34 (20.6%)
▪ South Korea	1 (9.1%)		▪ Middle East	24 (14.5%)
▪ Jordan	1 (9.1%)		▪ South Asia	30 (18.2%)
▪ Zimbabwe	1 (9.1%)			
▪ Nigeria	1 (9.1%)			
▪ Turkey	1 (9.1%)			
Marital Status			**Marital Status**	
▪ Single	8 (72.7%)		▪ Single	118 (71.5%)
▪ Married	3 (27.3%)		▪ Married	47 (28.5%)
Parental status			**Housing**	
▪ Children	2 (18.2%)		▪ On-campus	43 (26.3%)
▪ No Children	9 (81.8%)		▪ Off-campus	121 (73.7%)

4.1.1. Emotional struggles and socioeconomic challenges

The interviewees reported a wide range of emotional struggles during the outbreak, including stress, anxiety, worry, hopelessness, helplessness, and fear. Migrants in Gainesville felt the severity of the outbreak before the locals did, as the virus was spreading in their home countries. Moreover, several interviewees were losing their sense of security as xenophobic rhetoric accompanied soaring demand for guns and ammunition in the U.S. due to the fear of social unrest. Weapons were at the third-highest demand level since 1998, and some states reported the highest ever demand, such as 241% increase in New Jersey, and 390% increase in Connecticut (Touryalai, 2020). Some interviewees did not step out of their houses for weeks after reading about this increased demand for ammunition in the news.

On the other hand, there is a human need for social connections, and the physical distancing during the pandemic was conflicting with that. The social isolation and feeling of loneliness during the outbreak aggravated stress and negatively affected the overall mental health of the migrants we interviewed. Being around family and beloved ones help people cope with stress during difficult times, but many migrants are thousands of miles ways from their families who live overseas. This led some of them to adopt unhealthy coping mechanisms; two of our interviewees reported higher use of substances during the outbreak.

Simultaneously, the outbreak financially impacted migrants differently than any other group in the U.S. Migrants, living in the U.S., work and pay their taxes to the government and contribute to the economy like anyone else. Still, they did not qualify for any relief packages or financial assistance from the government, unlike the U.S. citizens and residents who received stimulus checks on multiple occasions during the outbreak (IRS, 2021). At the same time, the UF financial expectations from international students in particular were not adjusted; they were paying a tuition coving all the services they were not getting because the campus was closed. Additionally, when work and classes moved online, international students and foreign employees at UF were financially responsible for that transition in order to make their homes more study/work-friendly, which included purchasing necessities such as a computer, printer, desk, and office supplies, adding to their financial burdens. (See Table III in Appendix C for representative quotes)

4.1.2. Discrimination and lack of government and institutional support

Many migrants believe that their governments were imposing very strict measures to stop the virus spread, while being far less confident in the measures taken to contain the pandemic by the U.S. government in general, and by the City of Gainesville in particular. Several interviewees described the government as incompetent in responding to the outbreak, and they felt they were made fully responsible for their own safety in Gainesville. For example, UF tried to evacuate dorms at one point to slow the virus spread and made some of the grad-housing on campus quarantine zones. The UF grad-housing tenants are mostly migrants, which left many of them facing a future full of uncertainty. One interviewee went to Tennessee and stayed at a mountain cabin for a month because they were not feeling safe in Gainesville. Additionally, several interviewees living on-campus during the pandemic had serious maintenance issues in their houses. Even though

they extensively reached out to the university for help, it took weeks to fix the problems.

During the COVID-19 outbreak, many stories of racial discrimination spread among the migrant communities in Gainesville, which affected their sense of security. Chinese migrants were closely monitoring the announcements from their embassy, especially after it raised concerns about Donald Trump's adoption of the term "Chinese virus," as it incites hatred towards Chinese migrants. Our interviewees were concerned about the media popularization of the term "Chi-com virus," as in Chinese Communist, and they were seeing online petitions circulating in many states by concerned parents to pressure school authorities to apply additional restrictions on Asian families. This public pressure led to unnecessary control measures and validated more panic, causing additional xenophobia, even if it was sometimes unintentional.

While the City of Gainesville didn't take any specific measures in response to the hate crimes against Asians and the murder of George Floyd, the UF offered diversity training to students and staff. According to the interviewees, the diversity training focused on the unity of the American society and the different American ethnic groups within. Still, it did not include the Non-American ethnic groups who live in the U.S., excluding the migrants from the conversation once again. Some of the interviewees felt like the City of Gainesville and the UF administration was distancing themselves from them, which disappointed them, and some of them even described it as a "*betrayal.*"

In addition to the deportation threats due to the change in visa regulations, migrants in Gainesville were told by UF at one point that their visas would be canceled and they would be deported if they were found without a facemask on-campus, which left many of them disappointed in how the UF administration handled the situation, especially that the domestic students and domestic staff were not subjected to such extreme measures. All of that added to the struggle of the migrants in Gainesville during the outbreak and impacted their mental health. This also affected the image of the UF administration in the eyes of the migrants, and negatively impacted the trust foundation between the two. (See Table III in Appendix C for representative quotes)

4.1.3. Communication challenge

Migrants have different needs and attitudes towards communication, especially during emergencies. During the outbreak, the UF administration communicated to students and staff only in English, and the great majority of migrants do not speak English as a mother language. This could have serious negative implications on the way people perceive and respond to this kind of communication. Some interviewees believe that the UF communication has a serious visibility problem. The framing of the email titles is perceived as an everyday newsletter, which does not really provoke a sense of urgency, so many people end up dismissing the emails from UF. Simultaneously, most of the interviewees did not rely on the UF communication for updates on the outbreak, and they turned to different sources for information. This can be very dangerous due to fake news, false information and conspiracy theories that have spread about the virus and the safety of vaccines, as well as the technology behind them. Additionally, several interviewees criticized the language used in the UF communication and found it discriminatory, especially towards migrants, which left many of them frustrated. (See Table III in Appendix C for representative quotes)

4.2. Questionnaires

We received 209 responses for the survey, but 44 responses did not go beyond the demographic section of the survey, and so, they were excluded, and the analysis was based on the 165 complete responses that we received from migrants in Gainesville. The mean age of the participants was 27.9 (6.3) years. Around half of them (52.1%) were males, and almost one-third of the participants were from Asia (Far East). The majority of the participants (71.5%) were single and living off-campus (73.3%). For further details on the demographic characteristics of the study participants, refer to Table 1.

4.2.1. Depression and anxiety assessment

The overall depression score for the sample was 8.9, which falls on the PHQ-9 scale at the end of mild depression and, it is very close to moderate depression. On the other hand, the overall anxiety score for the sample was 9.3, and that also falls on the GAD-7 scale between mild and moderate anxiety. For further details on the prevalence of depression and anxiety stratified by severity, refer to Table 2. The proportion of participants who experienced any depression symptoms examined by the PHQ-9 scale or anxiety symptoms examined by the GAD-7 scale is highlighted in Table IV and Table V, respectively. (See Appendix D)

Table 2. Depression and anxiety levels stratified by severity

Depression diagnose (Score)	Frequency (%)
▪ Minimal depression (0.0 - 4.0)	46 (27.9%)
▪ Mild depression (5.0 - 9.0)	53 (32.1%)
▪ Moderate depression (10.0 - 14.0)	34 (20.6%)
▪ Moderately severe depression (15.0 - 19.0)	15 (9.1%)
▪ Severe depression (20.0 - 27.0)	16 (9.7%)
Anxiety diagnose (Score)	**Frequency (%)**
▪ Minimal anxiety (0.0 - 4.0)	45 (27.3)
▪ Mild anxiety (5.0 - 9.0)	41 (24.8%)
▪ Moderate anxiety (10.0 - 14.0)	45 (27.3%)
▪ Severe anxiety (15.0 - 21.0)	34 (20.6%)

4.2.2. The impact of demographic characteristics

Table 3 shows the mean depression and anxiety score stratified by demographic characteristics. Statistically, we found a significant difference in the mean depression and anxiety score based on gender, where males showed lower scores compared to others ($p<0.05$). Moreover, we used the binary logistic regression analysis to identify predictors of severe depression and anxiety among migrants, and we found that males had lower odds of developing anxiety by 60% compared to others (see Table VI Appendix D).

Table 3. Mean depression and anxiety score stratified by demographic characteristics

Demographic variable	Mean depression score (SD)	P-value	Mean anxiety score (SD)	P-value
Gender				
▪ Male	7.7 (6.6)	0.015*	8.2 (5.9)	0.020*
▪ Female	10.3 (6.8)		10.5 (6.1)	
▪ Other or prefer not to say	12.0 (5.7)		9.5 (4.9)	
Region				
▪ Africa	6.7 (6.1)	0.217	8.1 (5.8)	0.480
▪ Asia (Far East)	8.1 (6.6)		8.9 (6.3)	
▪ Europe and Canada	8.0 (7.3)		8.6 (6.8)	
▪ Latin America	8.5 (6.3)		8.8 (5.6)	
▪ Middle East	11.5 (5.9)		11.6 (5.1)	
▪ South Asia	10.2 (8.0)		9.4 (6.7)	
Marital status				
▪ Single	9.0 (7.3)	0.917	9.0 (6.3)	0.375
▪ Married	8.9 (5.4)		10.0 (5.5)	
Housing				
▪ Off-campus	9.2 (7.2)	0.497	9.1 (6.0)	0.644
▪ On-campus	8.3 (5.8)		9.7 (6.4)	

** p<0.05*

5. Discussion

Over the past decade, increasing numbers of academic studies demonstrate how migrants have greater difficulty adjusting to life in the U.S. (Abukhalaf et al., 2022). This often leads to emotional disorders like anxiety and depression

and poorer resiliency, which may interfere with their ability to adequately handle daily activities (Perry, 2016). Previous studies show that migrants immediately face many difficulties coping with language barriers (Abukhalaf & von Meding, 2021a); acculturative stress, or the process of change that persons of a racial and ethnic minority group experience while adopting the majority group's culture; having unrealistic work/study expectations; leaving family members in crisis situations or in countries with political unrest, and already dealing with levels of depression and anxiety from previous circumstances (Berry, 1974). Any new stressors confronted in their new American environment, even smaller ones, can be problematic and cause increased mental health issues such as depression and anxiety.

The present situation in the U.S., which includes the challenges of a record pandemic and, in some geographical locations, worsening national disasters, exacerbates the migrants' emotional distress and makes them even more vulnerable. Recent studies show that inadequate efforts to recognize and address mental health challenges, especially during a pandemic, could have long-term consequences (Browning et al., 2021; Misirlis et al., 2020; Naser et al., 2020a). In their book on disaster mental health, Schmidt and Cohen clearly delineate how both nature and human-caused catastrophes can lead to long-term depression, acute stress, and post-traumatic stress disorder (PTSD). Following a disaster, about 20% of the most vulnerable victims will acquire PTSD within two months' time if not properly assessed and treated by trauma-informed providers (Schmidt & Cohen, 2020). Schmidt and Cohen, like others in their field, stress how the U.S. is now facing a mental health crisis that could exist far into future years. The present pandemic is causing psychological problems in all populations, not only the most at-risk, due to COVID's geographical extent and long-lasting impact (Cohen et al., 2021).

Migrants who remained in the U.S. during lockdown experienced more adverse mental health effects than those returning home. Negative emotions, such as loneliness and depression, were strengthened due to the obligatory lockdown due to COVID-19 (Yuen-kwan et al., 2020). Emotional struggles significantly affect people's wellbeing, and that was clear to us from the interviews we conducted (see Table III in Appendix C). Social isolation conflicts with the human need for social connections, which help people cope with stress by regulating their emotions during difficult times (Bavel et al., 2020; Hawkley & Cacioppo, 2010). Due to the social disconnection, many people, including our interviewees, faced serious psychological consequences such as depression and anxiety (Davis et al., 2015; Courtet et al., 2020). This had led people in the past, at institutions of higher education in particular, to the adoption of unhealthy coping mechanisms such as relying on higher consumption of alcohol and drugs (Prost et al., 2016). And we saw that with two out of the eleven interviewees who participated in this study.

5.1. Emotional impact and mental health

The various struggles that people went through during the COVID-19 outbreak had a great impact on their mental health. "*Anxious*" and "*Depressed*" were the most repeated words by the interviewees when it came to describing how they felt during such challenging times (see Table III in Appendix C). The biggest problem with depression and anxiety is that they can lead to other mental and physical problems as well (Naser et al., 2021). When people are coping with an emotional issue, their memory may suffer, and negative results can lead to additional emotional stress. Studies show that physical

symptoms such as headaches, fatigue, nausea, and general malaise can arise, and with time, chronic illnesses can arise as well (Schmidt & Cohen, 2020). Moreover, when a person is coping with an emotional issue, they may worry extensively and not be able to focus on their present responsibilities or think positively about daily events and activities (Naser et al., 2020a). Our findings support that; eight out of the eleven interviewees and 80% of survey participants faced difficulties in doing their work, taking care of things at home, or getting along with other people (see Tables II, IV & V, in Appendix B & D, respectively).

Diagnosing depression can be difficult due to the diversity of symptoms; however, this diversity was diminished through a common and standardized language of mental health diagnoses that was established by the American Psychiatric Association in the Diagnostic Statistical Manual of Mental Disorders (APA DSM-5, 2013). The DSM-5 now bases a depression diagnosis on the following symptoms; 1) Depressed mood, 2) Markedly diminished pleasure or interest in activities, 3) Notable weight fluctuation due to increase or significant decrease in appetite, 4) A reduction of physical movement and a slowing down of thought, 6) A Feeling of worthlessness or inappropriate or excessive guilt, 7) Indecisiveness or diminished ability to concentrate or think, and 8) Suicide attempt, recurrent suicidal ideation, or recurrent thoughts of death (APA DSM-5, 2013). Additional conditions often occur with depression, such as eating disorders and substance abuse (Kuehner, 2017).

In the present study, 14% of the reported symptoms from the interviewees on the PHQ-9 scale (see Table I in Appendix B) were depression symptoms that require close monitoring and treatment plan (Yoon et al., 2014; Maurer et al., 2018). In the survey, a total of 18.8% (n= 31) of the study sample had a depression score of (15 and above) on the PHQ-9 scale (see Table 2), which is interpreted as moderately severe to severe depressive status. This requires active treatment with pharmacotherapy and, in case of poor response to therapy, there should be an expedited referral to a mental health specialist for psychotherapy (Maurer et al., 2018).

In one of the recently published studies, depression levels were measured among 1821 domestic college students in the U.S. during the pandemic; 50.3% reported mild to severe depression (Rudenstine et al., 2021). Another study combined data of 89 different studies. With a total sample size of 1,441,828 college students around the world, the study shows that 34% of the sample reported mild to severe anxiety (Deng et al., 2021). Our findings show that migrants suffered from higher depression levels compared to other domestic groups in the U.S. college towns according to the previously mentioned studies; 71.5% of the participants in our survey reported mild to severe depression, 39.4% reported moderate to severe depression, and the mean depression for our sample was 8.9 on the PHQ-9 scale (see Table 2). Additionally, our findings are consistent with another study that has been conducted on international students at five U.S. colleges, and it shows that 40.2% of international students suffered from moderate to severe depression, and the mean of depression in their study was 8.79 on the PHQ-9 scale (Maleku et al., 2021).

On the other hand, researchers do not know exactly what causes anxiety disorders. There is a complex mix of factors that play a role in this, such as genetics, brain chemistry, environmental stress, drug withdrawal or misuse, and other medical conditions (APA DSM-5, 2013). There are various kinds of anxiety disorder, such as generalized anxiety disorder, panic disorder, and separation anxiety (Naser et al., 2020a), and specific symptoms depend mainly on the type of anxiety

disorder; however, the main and in common symptom of all anxiety disorders is excessive worry or fear. Excessive anxiety can make people avoid work, school, social gatherings, and any other situations that could trigger or worsen the symptoms. Anxiety disorders, in some cases, can also cause difficulty in breathing, sleeping, staying still, and concentrating (APA DSM-5, 2013).

In the present study, 10% of the reported symptoms from the interviewees on the GAD-7 scale (see Table II in Appendix B) were anxiety symptoms that require a treatment plan and close monitoring (Yoon et al., 2014; Maurer et al., 2018). In the survey, a total of 20.6% (n= 34) of the study sample had an anxiety score of (15 and above) on the GAD-7 scale (see Table 2), which is symptomatically diagnosed as having severe anxiety. This requires an active treatment plan and pharmacotherapy evaluation, and, in case of poor response, there should be a referral for a higher level of care (Esser et al., 2018). Living with an anxiety disorder can be frustrating and challenging, and between medicine, counseling, or a mix of the two, it can take a long time to find the right treatment that works for each case (Varghese et al., 2021; Naser et al., 2020b).

According to Rubenstein's study that she conducted on 1821 U.S. domestic college students during the pandemic, 41.3% of students suffered from mild to severe anxiety (Rudenstine et al., 2021). Similarly, anxiety levels were measured among 1640 domestic U.S. college students during the outbreak. The mean anxiety for the sample was 6.96 on a GAD-7 scale (Biber et al., 2020). In another study, also conducted during the pandemic, anxiety levels were measured among 237 domestic college students in the U.S.; 58% of students reported mild to severe anxiety, and the mean anxiety for the sample was 7.1 on a GAD-7 scale (Perz et al., 2020).

A similar study was conducted during the pandemic on domestic students in seven different countries, including the U.S., where anxiety levels were measured for 2254 college students. 36.4% of students reported moderate to severe anxiety (Du et al., 2020). According to Deng's study that included college students in 27 countries worldwide, 32% of the sample reported mild to severe anxiety (Deng et al., 2021). Our findings show that migrants suffered from higher anxiety levels compared to other domestic groups in the U.S. college towns according to the previously mentioned studies; 72.7% of students reported mild to severe anxiety, 47.9% reported moderate to severe anxiety, and the mean anxiety for the sample was 9.3 on the GAD-7 scale (see Table 2). Additionally, our findings are consistent with Maleku's study, which shows that 40.4% of international students in the U.S. suffered from moderate to severe anxiety, with a mean of 8.11 for anxiety on the GAD-7 scale (Maleku et al., 2021).

Our research results reinforce the need for college towns to provide ongoing emotional support services for migrants. It is found that migrants will often not seek psychological help due to fear of stigmatization or only want to speak to someone with their cultural background (Redden, 2019). In other situations, they may wait as late as possible to seek help. In many cases, they don't even know that social workers and psychological counselors are available for therapy and/or pharmacology (Farnsworth, 2018). It needs to be reinforced that most migrants share the same adaptive issues. Some college towns set up peer or mentoring systems and hold specific workshops to help in the coping process of migrants. These workshops can cover visa specifics, support systems, financial aid, tax preparation, mentoring, language acquisition, networking, and cultural adaptation (Redden, 2019).

This study also sheds a light on the differences between females and males with depression and anxiety. Numerous studies, including the current one, find that females are considerably more susceptible than males to stressful situations. Statistically, we found a significant difference in the average depression and anxiety scores based on gender, where males showed lower scores compared to others surveyed (see Table 3). Similarly, we found that males had lower odds of developing anxiety by 60% compared to the other demographic groups questioned (see Table VI in Appendix D). The fact that these participants in the study are from varying countries and cultures is of additional interest. According to the WHO, an estimated 264 million people are affected by depression, which accounts for 10% of the entire non-fatal disease set worldwide. In addition, women suffer considerably more from depression than men. This gender difference represents a significant health discrepancy (WHO, 2020).

Research as early as the beginning of the 21st century (Norris, 2002) defined the most vulnerable populations. Since then, it is regularly found that girls are twice as likely be depressed (Kuehner, 2017). Some of this is due to hormonal changes, but these do not account totally for greater depression. Other biological factors, inherited traits, experiences, and personal circumstances are associated with a higher risk of emotional issues, including unequal status and power, and work overload (Mayo Clinic, 2021).

Even with these gender differentiations, it cannot be assumed that men are as free of depression as statistics show (Kelly, 2021). Kelly explains that many boys are still raised to believe that crying is unacceptable and that men aren't supposed to show their emotions. Many men, therefore, may ignore emotional concerns or not want to discuss them with others. Some men may also not recognize the symptoms of depression and anxiety when they occur. In addition, the stigma of mental health is far-reaching across the world for all genders. The results of this differentiation are unfortunate, with more men than women likely to commit suicide (Kelly, 2021). Not only should mental health be part of the City of Gainesville and UF administration emergency management plan, but also these gender-based differences in emotional impacts should be integrated and taken into consideration in the planning process of emergency responses.

In addition, previous studies show that age is another important factor that influences people's psychological status, where older people are found less likely to be affected psychologically as they adapt to new situations faster than the young ones (Flint et al., 2010; Scott et al., 2013; Schilling & Diehl, 2015). However, the age range of the interviewees in this study, as mentioned before, was 24 to 37 years, which is a relatively small range, and that makes it difficult to relate to previous research done in this area. Due to the same reason, we also didn't find any statistically significant variation based on age in the survey responses.

5.2. Additional stress gained from co-occurring calamities

Our study adds another dimension to the migrants' adaptability problems in the U.S.: the role that national and local politics play in the migrants' wellbeing, which has only been addressed sparingly in the past several years (Jenks, 2012). Many migrants do not face open and nonjudgmental environments in the U.S., but rather ones that are described as oppressive and forcing "Americanization" where other cultures are undermined (Lee & Rice, 2007; Pottie-Sherman, 2018). Such environments have a considerable negative impact on the migrants' psychological wellbeing, including social anxiety

and suicidal ideation—both of which are included in this current study (see Tables II, IV & V, in Appendix B & D, respectively).

Political factors often fall into areas of “uncertainty” or “unpredictability.” Uncertainty has been covered extensively (Scholz, 1983), but researchers have recently been paying closer attention to this theory in terms of migrants. Uncertainty is defined as incomplete knowledge or information about a situation or the probability of its occurrence, and its outcome unknown by the subjects. Uncertainty is believed to be a significant psychological stressor, where the most susceptible people become stressed and also may physically experience illness (Greco & Roger, 2003). Uncertainty is also associated with many mental health problems, including neurotic behavior, depression, and anxiety (Greco & Roger, 2003).

Our results clearly show that some migrants can quickly become depressed and/or anxious (or more depressed and/or anxious) in a short period of time of uncertainty (see Table 2). It is known that such issues as language difficulties, loneliness, and adaptability can cause emotional problems for migrants (Abukhalaf & von Meding, 2020). However, less is known about how uncertainty can similarly lead them to feel depressed and anxious. Understanding what underlines mental health challenges can provide a better understanding of the ways to provide support for others who have similar issues.

It is very important for city and university counselors to reach out to migrants when emotionally impactful political issues arise. Counselors should consider talking to migrants either one-on-one or in small groups due to possible language and cultural barriers. People with anxiety and depression have considerable difficulties prioritizing and making decisions, especially if they need to be made quickly (Cartreine, 2016). It can be assumed that any anxiety or depression that migrants had prior to these issues will be worsened. Based on the data we collected from the interviewees, the City of Gainesville seems to be out of the picture when it comes to emergency situations that relate to migrants. The city should be more present, and it needs to collaborate with the university to develop measures that can address and manage mental health issues, including anxiety and depression, during such circumstances. For example, wellness activities, including yoga, meditation, and mindfulness, can also be encouraged and offered on or off-campus or online (Schmidt & Cohen, 2020).

On the other hand, inequality and discrimination during the outbreak were a major theme in the interviews we conducted. Xenophobia has roots that are deeply embedded within the American history, especially the kind that arose from health concerns (Huang & Liu, 2020). Migrants of color, particularly Asians, have been labeled in the American society as ‘*disease carriers*’ since the 1800s, where they were subjected to extensive and humiliating medical screening after arriving to the U.S.—screening that white migrants did not experience (AIISF, 2021). For the past two years, uncertainty and lack of information around the new coronavirus have generated fears toward people of Asian origins, making stigmatization and discrimination unfortunate byproducts of the COVID-19 pandemic (BBC, 2020a). The outbreak has intensified racism and brought overt instances of physical and verbal abuse; hate crimes against Asians have risen to more than 100 occurrences per day during the pandemic (Kelly, 2020). In Gainesville, two-thirds of the migrants come from Asian countries, and so they were susceptible to this ‘*tsunami of hate and xenophobia’* as described by UN officials

(HRW, 2020), which significantly affected their sense of security in this country as we noticed from the interviews we conducted.

Recent studies show that negative public views of Asians are at the highest level seen in the U.S. since 2005 (Silver et al., 2019). The hysteria infiltrated many of the college communities in the U.S. For example, the health services center at University of California-Berkeley listed xenophobia toward Asians as a '*normal reaction*' to the outbreak (Asmelash, 2020), and that breeds prejudice, justifies xenophobia, and promotes ethnic discrimination. Similarly, after the spread of the Delta Variant in the U.S., xenophobia toward South Asians, especially people from India, was expected to rise, making discrimination in times of COVID-19 a cycle of racism where different ethnicities take turns and being blamed for something they are not responsible for.

In response to the upsurge in xenophobia and racist attacks related to the spread of COVID-19, a social movement named 'Stop AAPI Hate' started to track incidents of discrimination and hate against Asian Americans and Pacific Islanders (AAPI) (Takasaki, 2020). In order to address anti-Asian racism effectively, the movement aimed to end all the different forms of structural racism against communities of color in the U.S. (Takasaki, 2020). Nevertheless, our interviewees believe that this movement does not represent them, because it focuses on Asian Americans in particular, and that excludes the Asian migrants from the conversation and leaves them without a voice. Given this upsurge in xenophobia and racism related to the COVID-19 pandemic, the City of Gainesville and the UF administration should have taken urgent steps to stop all kinds of discrimination linked to the pandemic, and they should have adopted new action plans tailored to the new and changing circumstances. These action plans need to lay out specific approaches in order to address all the emerging forms of xenophobia and discrimination.

Another significant shift in U.S. society in 2020 was catalyzed by the murder of George Floyd. The police brutality and George Floyd's death in the middle of the pandemic sparked an outrage that drove thousands of people to protest across the country (Robinson et al., 2020). Floyd's death exploded a racially-charged activism after months of uncertainty and isolation due to the COVID-19 outbreak (Powell, 2020). Consequently, the social movement named Black Lives Matter (BLM), which was originally established in 2013, started to get more attention from the social media as they were protesting against police brutality and all racially-motivated violence against African Americans (Rojas, 2020).

Beyond opposing police misconduct, people in the U.S. marched because the pandemic disproportionately impacted communities of color, highlighting the inequality in the U.S. health care system (Powell, 2020). The high rates of chronic illnesses among African Americans made them especially vulnerable to the coronavirus, and that left them extremely worried as the health care system was failing them in the face of the spreading virus (Robinson et al., 2020). Moreover, crowds gathered daily in cities around the U.S., condemning the economic injustices reflected in millions of pandemic-related job losses that hit the African American communities (Rojas, 2020).

Most of the protests began peacefully, but in many cases, demonstrators clashed with the police forces, leading to aggravated violence across the country (Powell, 2020). This state of instability, combined with the spreading violence, had a significant negative impact on the well-being of many of the migrants we interviewed, especially the ones with African origins, as it affected their sense of belonging, as well as their sense of security in Gainesville and in the country.

And similar to the ‘Stop AAPI Hate,’ the interviewees felt underrepresented in the BLM movement, as it focuses on African Americans and overlooks African migrants who live in the U.S.

In order to have effective and equitable crisis management strategies, condemning racism repeatedly and publicly should be an essential part of the city’s response to pandemics and disasters (Huang & Liu, 2020). The UF administration needs to collaborate with the City of Gainesville to expand public outreach, counter hate speech, and promote tolerance on and off-campus. They also should adopt targeted public education initiatives and offer support to migrants who have been victimized by any racially motivated verbal or physical abuse. With help from the university, the city should promote activities between locals and migrants in order to lower prejudice and misunderstanding (Abukhalaf & von Meding, 2021b). Multiculturalism activities and projects can help promote inclusion and calm feelings of marginalization. If migrants shy away from these events, positive aspects of involvement can be reinforced. The UF administration needs to make sure that all the different groups on-campus have a voice, especially the migrant communities who feel underrepresented and overlooked.

6. Strengths, Limitations, and Future Research

Migrants in the U.S. are underrepresented in pandemic and disaster studies. Our study helps in filling this critical research gap by developing new knowledge about migrants at U.S. college towns during the COVID-19 outbreak. This study presents a significant opportunity to study culturally different groups who went through a serious life transition, and offers critical policy insights that will help in their empowerment, and that will enhance the overall crisis management practices and risk mitigation strategies in U.S. college towns.

To achieve a confidence level of 95% and a margin of error of 10%, we determined the minimum sample size for this study to be 97 survey responses. We received 165 complete responses, reflecting a margin of error of 7.5% instead of 10%, and making our findings more reliable. However, additional surveys with even higher confidence levels and lower margins of error should be conducted in the future to generalize the findings to the entire migrants’ community in Gainesville. Moreover, the survey participants were not asked to specify some demographics, such as household income, which could have added a different perspective to our quantitative analysis. Additional comparative studies using multivariable models can be conducted in the future to explore the influence of more demographics on the emotional impact of the outbreak on migrants in Gainesville.

The number of the interviewees we had in this study, eleven interviews, is relatively small, but it is still acceptable for qualitative data analysis that enables key themes to emerge. The interviews focused on the migrants’ perspective; nevertheless, more interviews should be conducted in future research with key informants in the City of Gainesville and at UF to reflect on the findings of this study and help us better understand the impact of the outbreak on migrants. Furthermore, there is no available data on the emotional impact of the outbreak on migrants in Gainesville before the change in visa regulations by ICE. This means we do not know the migrants’ depression and anxiety levels caused by the outbreak itself, so we could not exactly identify from the survey responses how the ICE announcement changed these

levels. Moreover, we included migrants with F1, F2, M1, M2, J1, and J2 visa types in our study; nevertheless, future studies should include migrants under other working visa types, such as H-1B and H-1C visas. This could have given our results a new dimension helping us in filling the research gap that relates to U.S. migrants in pandemic and disaster studies.

Our data show significant variations in the emotional impact between males and females, especially in the depression and anxiety disorder screenings. Additional comparative studies should be conducted to explore the differences between the two genders within the community of migrants in Gainesville. Additionally, due to the limited research that can be found about migrants in pandemic and disaster studies, the findings of this research cannot be generalized, and they are specific to the context of Gainesville, and not representative of other college towns across the U.S. However, our findings still provide new insight into this new area of study, and may have awakened new questions concerning human behavior during the pandemic, which makes this area an interesting subject for future studies.

7. Conclusion

Migrants can be more vulnerable in the face of pandemics due to the limited access to resources, inequality, cultural differences, and language barriers (Abukhalaf & von Meding, 2021b; Thorup-Binger, 2018). This study aims to develop new knowledge about migrants during the COVID-19 outbreak in Gainesville, Florida. The main goal of our study is to help close this research gap by answering the following research questions: How did the COVID-19 outbreak impact the wellbeing of migrants in Gainesville, Florida? And how did the changes in visa regulations and deportation threats during the COVID-19 outbreak affect the anxiety and depression levels among migrants in Gainesville, Florida? We used a mixed-methods approach for data collection and analysis. This involved semi-structured interviews with eleven migrants from Gainesville, Florida. Following the interviews, we conducted a cross-sectional survey, which was completed by 165 migrants from Gainesville.

Three main themes resulted from the qualitative analysis of the interviews; 1) Emotional struggles and socioeconomic challenges, 2) Discrimination and lack of government and institutional support, and 3) Communication challenges. On the other hand, the overall depression score for the survey sample was 8.9, which falls on the PHQ-9 scale at the end of mild depression, and it is very close to moderate depression. Similarly, the overall anxiety score for the survey sample was 9.3, and that also falls on the GAD-7 scale between mild and moderate anxiety. Our findings provide insights into the experience of culturally different groups, and offer practical policy insights that help in developing more equitable pandemic and crisis management and more effective overall risk mitigation strategies.

Appendix A (Interview Questions)

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Interview questions for research entitled “COVID-19 outbreak impact on the wellbeing of migrants in U.S. College towns”

	Interview Questions
1	Can you introduce yourself to us (age, country of origin, how long have you been in the U.S, where do you live, etc.)?
2	Do you remember the first time the UF sent out an email about Covid-19? Descript how you felt when you got that email?
3	How did your daily routine change during Covid-19?
4	What helped you adjust to that new routine and how long did it take you to do so?
5	How did Covid-19 impact your country? And how did that make you feel?
6	Describe your feelings, fear, and concerns during the pandemic?
7	What are the challenges that you faced living in the U.S during the pandemic?
8	What do you think about the precautionary measures taken by the University? And did make you feel safe?
9	What do you think about the University’s communication during the pandemic?
10	What was the main source of information for you about Covid-19?
11	How did Covid-19 change your social life?
12	Did you face any financial struggles because of the pandemic?
13	How do you think the pandemic affected you differently compared to the domestics?
14	What do you think the University would have done better during the pandemic?
15	Is there anything else would you like to share with us?

Appendix B (Survey Pilot Testing)

Table I. PHQ-9 screening results of interviewees

Depression Screening	Not at all		Every now and then		More than half of the time		Almost all the time	
	Male	Female	Male	Female	Male	Female	Male	Female
1. Little interest or pleasure in doing things.	2	1	3	2	**1**	**2**	-	-
2. Feeling down, depressed, or hopeless.	4	1	-	4	**2**	-	-	-
3. Trouble falling or staying asleep, or sleeping too much.	3	1	2	2	**1**	**1**	-	**1**
4. Feeling tired or having little energy.	2	-	4	3	-	**2**	-	-
5. Poor appetite or overeating.	6	-	-	3	-	**2**	-	-
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.	4	2	2	3	-	-	-	-
7. Trouble concentrating on things, such as reading the newspaper or watching television.	3	3	2	1	-	**1**	**1**	-
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual.	6	3	-	2	-	-	-	-
9. Thoughts that you would be better off dead, or of hurting yourself in some way.	6	5	-	-	-	-	-	-

*Numbers in bold indicate the number of participants suffering from specific depression symptoms that require close monitoring and treatment plan (Yoon et al., 2014; Maurer et al., 2018).

Table II. GAD-7 screening results of interviewees

Anxiety Disorder Screening	Not at all		Every now and then		More than half of the time		Almost all the time	
	Male	Female	Male	Female	Male	Female	Male	Female
1. Feeling nervous, anxious, or on edge.	2	1	4	2	-	**2**	-	-
2. Not being able to stop or control worrying.	2	2	3	2	-	**1**	**1**	-
3. Worrying too much about different things.	2	1	3	3	-	**1**	**1**	-
4. Trouble relaxing.	2	1	4	3	-	-	-	**1**
5. Being so restless that it's hard to sit still.	5	3	1	2	-	-	-	-
6. Becoming easily annoyed or irritable.	4	1	2	3	-	**1**	-	-
7. Feeling afraid as if something awful might happen.	3	2	3	3	-	-	-	-
If you checked off any problems above in section (GAD-7)	Not difficult at all		Somewhat difficult		Very Difficult		Extremely Difficult	
	Male	Female	Male	Female	Male	Female	Male	Female
How difficult have these made it for you to do your work, take care of things at home, or get along with other people?	1	2	5	2	-	-	-	1

*Numbers in bold indicate the number of participants suffering from specific anxiety symptoms that require close monitoring and treatment plan (Yoon et al., 2014; Maurer et al., 2018).

Appendix C (Qualitative Analysis)

Table III. Representative Quotes

Main Themes	Sub-themes	Samples of Representative Quotes
1. Emotional struggles and socioeconomic challenges.	Emotional struggles	*"Even before Covid got to the U.S., it was spreading in Iran, and I lost a relative, which made me very worried about my family over there! I was calling them constantly! I was so anxious and nervous, I couldn't sleep for days!" (Angel, Interviewee)*
		"People were losing their jobs and they were frustrated and depressed! And with all of the radicalization of politics, and people buying firearms! I definitely didn't feel safe! Buying a gun in the U.S. is literally easier than passing a driving test or even getting a job at McDonald's!" (Alex, Interviewee)
		"When my sister finished her medical internship in Tennessee, she couldn't go back home, because Jordan was under a complete lockdown! She was very anxious because she almost missed her final exams, which would have put all her life on hold for a full year!" (Jaime, Interviewee)
		"I was literally crying and praying every day for my parents' health and safety! There was no way that I could be with them or help them if something happened! I honestly ended up using plant-based substances to help me cope!" (Erin, Interviewee)
	Socioeconomic challenges	*"The fear of stepping out, even if I wear a mask, even if I sanitize, there is a chance that I may get the virus, and if I get the virus then just the fact that my family isn't around and my friends won't be able to come and take care of me, that's alone was very depressing!" (Alex, Interviewee)*
		"The school expectations from me as a student remained the same! Even financially, I was paying the same; my tuition was coving all the services that I was not getting because the campus was shut down!" (Jeramy, Interviewee)
		"We are paid less than the domestics, and we pay taxes but we barely get any tax return, while the domestics do! They also got stimulus checks, and we didn't, and many of them lived with their families which saved them even more money, while it was impossible for us to even see our families!" (Drew, Interviewee)
		"The idea that you are stuck at home by yourself and you can't step outside to meet the few people you know, adding that hindrance of not being able to have that social support! I had this awful feeling of helplessness and loneliness" (Alex, Interviewee)
2. Discrimination and lack of government and institutional support.	Discrimination and inequality	*"We get an email from the UF international center saying that if you don't wear a mask, your visa will be canceled, like they were threatening us! And it felt unfair because that wouldn't apply to the domestics! Then we had to take this diversity training that was given by UF, which focused only on discrimination against Asian Americans, but what about the hundreds of Non-American Asians who live in the U.S.?!" (Kim, Interviewee)*
		"Picking up my husband wearing a Hijab, while a Trump rally passing by, I honestly wasn't feeling safe! As a Muslim, I know how portraying something in the media can affect people's behaviors, so I was not even surprised to see the hate crimes against Asians! It's all part of the same mentality!" (Jaime, Interviewee)
		"The Asian hate crimes were spreading in the U.S., and the news reports started to come in, and I gradually realized Oh, this is a thing! Like people are really doing this horrible stuff! I was very anxious!" (Jeramy, Interviewee)
		"If I don't wear a mask on campus, then you will force me to leave the country in the middle of a pandemic! How can the school equate my whole existence to a piece of paper on my passport?"(Jeramy, Interviewee)
		"With all the violence that was taking place after George Floyd was killed, I was really afraid! Not because I am not only an international student, but also I am black! If I were white, this wouldn't have affected me the same way!" (Riley, Interviewee)
	Lack of government and institutional support	*"Why would you make the Grad-Housing a quarantine zone? Where people live with children and elderly parents? Why are we being exposed to the extra risk! I don't understand! If it was an All-American Community, they wouldn't do that, but there is an exploitative motive here, because they know that we are less likely to take the streets and protest as the Americans wouldn't hesitate to do!" (Riley, Interviewee)*
		"It was unbelievable to see the U.S. Government acting the same way as the government back in Iran! I couldn't believe that the president would ignore the problem and act like it did not exist! That was shocking!" (Angel, Interviewee)
		"COVID-19 really exposed a lot of the issues embedded in our political system; political decisions replaced sound health precautions, and everything was based on negotiation with politics and money! I know this is how modern politics work, but still, it is horrifying!" (Riley, Interviewee)
		"I had a friend, who developed some mental issues during the lockdown, and he went for treatment, but along the line, they withdraw his assistantship and he had to withdraw from school! Rather than sending foreign students home, they should support them emotionally and in every other way!" (Ashton, Interviewee)
		"Then the UF comes out and condemns it, but nothing more than that! I need to see the measures you are taking to make sure people are safe, that you are truly taking a stand and not just saying something!" (Riley, Interviewee)

3. Communication challenge	Communication challenge	*"The school communication wasn't very sufficient. The university was following whatever CDC was saying, who were already contradicting themselves for some time, and that was irresponsible in a way!" (Kim, Interviewee)*
		"My problem with the UF communication is that I find it too wordy, especially for someone who does not speak English as a first language! I rather see a short video than reading a long email!" (Angel, Interviewee)
		"The problem with UF communication is visibility! I usually dismiss the emails from UF, the framing of the email titles is like everyday newsletter and that doesn't really provoke a sense of urgency!"(Jeramy, Interviewee)
		"We are scientists and doctors, and it's not acceptable to be receiving emails that imply such attitude, and use such language that I have never seen it being used with domestics!" (Jaime, Interviewee)

Appendix D (Quantitative Analysis)

Table IV. Depression assessment using PHQ-9 scale

Questions	**Not at all**	**1-3 days a week**	**4-5 days a week**	**6-7 days a week**
1. Little interest or pleasure in doing things.	25.5%	52.7%	11.5%	10.3%
2. Feeling down, depressed, or hopeless.	24.2%	39.4%	21.8%	14.5%
3. Trouble falling or staying asleep, or sleeping too much.	30.9%	34.5%	21.8%	12.7%
4. Feeling tired or having little energy.	27.9%	35.7%	23.6%	12.7%
5. Poor appetite or overeating.	41.2%	24.8%	19.4%	14.5%
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.	41.8%	26.1%	21.2%	10.9%
7. Trouble concentrating on things, such as reading the newspaper or watching television.	31.5%	32.1%	23.6%	12.7%
8. Moving or speaking so slowly that other people could have noticed. Or being so fidgety or restless that you have been moving around a lot more than usual.	58.2%	20.6%	14.5%	6.7%
9. Thoughts that you would be better off dead, or of hurting yourself in some way.	81.8%	10.9%	3.0%	4.2%
	Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
*If you checked off any of the problems above, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?	22.4%	46.7%	21.2%	7.9%

Table V. Anxiety assessment using GAD-7 scale

Questions	Not at all	1-3 days a week	4-5 days a week	6-7 days a week
1. Feeling nervous, anxious, or on edge.	16.4%	40.6%	28.5%	14.5%
2. Not being able to stop or control worrying.	24.8%	33.9%	26.1%	15.2%
3. Worrying too much about different things.	18.2%	32.1%	29.1%	20.6%
4. Trouble relaxing.	21.2%	30.9%	28.5%	19.4%
5. Being so restless that it's hard to sit still.	38.8%	34.5%	15.8%	10.9%
6. Becoming easily annoyed or irritable.	32.1%	38.7%	18.2%	10.9%
7. Feeling afraid as if something awful might happen.	26.1%	26.6%	26.7%	20.6%
	Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
*If you checked off any of the problems above, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?	20.6%	16.3%	20.0%	43.0%

Table VI. Predictors of severe depression and anxiety

Demographic variable	Odds ratio to develop moderately severe to severe depression (95% CI)	Odds ratio to develop to severe anxiety (95% CI)
Age (mean (SD)) **years**	1.0 (0.9-1.0)	1.0 (0.9-1.0)
Gender		
▪ Female (Reference category)	1.0	1.0
▪ Male	0.5 (0.2-1.1)	0.4 (0.2-0.8)*
▪ Other or prefer not to say	-	-
Region		
▪ Africa (Reference category)	1.0	1.0
▪ Asia (Far East)	0.5 (0.2-1.4)	1.0 (0.4-2.3)
▪ Europe and Canada	1.1 (0.3-4.1)	1.0 (0.3-3.6)
▪ Latin America	0.9 (0.3-2.4)	1.0 (0.4-3.5)
▪ Middle East	1.5 (0.6-4.3)	1.3 (0.5-3.7)
▪ South Asia	1.8 (0.7-4.5)	1.0 (0.4-2.6)
Marital status		
▪ Single (Reference category)	1.0	1.0
▪ Married	0.6 (0.2-1.5)	1.3 (0.6-2.9)
Housing		
▪ Off-campus (Reference category)	1.0	1.0
▪ On-campus	0.5 (0.2-1.3)	1.5 (0.6-3.3)

** $p<0.05$*

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