DEPRESSION, ANXIETY, AND PERCEIVED STRESS DURING A PANDEMIC: AN UNDERSTANDING OF THE PSYCHOLOGICAL IMPACT OF COVID-19 ON A UNIVERSITY COMMUNITY

by

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ABSTRACT

FAUSTINA OSHOKÉ BELLO-OGUNU. Depression, Anxiety, and Perceived Stress During a Pandemic: An Understanding of the Psychological Impact of COVID-19 on a University Community. (Under the direction of DR. LARISSA BRUNNER HUBER)

COVID-19 is a viral infectious disease that first occurred in Wuhan, China in December 2019 and by March 2020, it was declared a pandemic by the World Health Organization. Mental health – especially as it relates to physical distancing, loneliness, and stress – is a major public health concern as the COVID-19 pandemic continues. The social, economic, and environmental effects have been associated with emotional distress, anxiety, loneliness, boredom, depression, irritability, frustration, insomnia, blaming, anger, panic attacks, delirium, general fear, fear of dying or falling sick, helplessness, confusion, and stigma. Despite the increased attention on mental health and the psychological impact of COVID-19 on the general population, and even student populations, studies have been primarily conducted outside the United States (U.S.) and focused on the immediate aftermath or earliest stages of the pandemic. Few studies have focused on university communities and even fewer included faculty and staff in the study population. Furthermore, many evaluated the immediate aftermath or earliest stages of the pandemic rather than possible effects months or a full year later. Given this, the purpose of this three-manuscript dissertation was to understand "what impact has COVID-19 had on the psychological wellbeing of faculty, staff, and students at a public American research university?" and includes three primary aims: 1) to explore how sociodemographic factors are related to the psychological impact of COVID-19 on a collegiate community; 2) to evaluate the association between physical distancing and psychological impact, with past community trauma and social support as effect modifiers; and 3) to evaluate the association between perceived stress and depression and anxiety symptoms with resilient coping and social support as mediators of this relationship. Two

frameworks guided this study – the Social and Cultural Determinants of Mental Disorders Framework by Lund, et al. and the *Stress Buffering Model* by Cohen & Willis.

This quantitative study employed primary data collection. A cross-sectional study of a university population used a web-based, online questionnaire to collect information on the psychological impact of COVID-19 as evidenced by anxiety symptoms (using the Generalized Anxiety Disorder 7-item Scale), depression symptoms (using the Patient Health Questionnaire 9-item Scale), and perceived stress (using the Perceived Stress Scale). The questionnaire also used the DeJong Geirveld Loneliness Scale to assess loneliness, the Multidimensional Scale of Perceived Social Support to assess perceived social support, and the Brief Resilient Coping Scale (BRCS) to measure resilient coping. An email was sent via an anonymous link to every member of the university – all faculty, students, and staff – who were working or enrolled at the university prior to the start of the Spring 2020 semester (i.e. January 8, 2020). Data were collected over ten weeks between December 2020 and February 2021. Summary statistics of the sociodemographic characteristics of participants and outcomes were calculated. Both ordinal and binary logistic regression was used to obtain odds ratios and 95% confidence intervals to provide unadjusted measures of the associations between each of the exposures and outcomes, depending on the study. Multivariate ordinal and logistic regression models, controlling for confounders, were created by including all the potential predictors in each model and then using a backwards elimination procedure to retain only predictor variables with $p < 0.20$. In chapter three, stratified analyses were used to evaluate whether past community trauma or perceived social support modified the physical distancing and psychological wellbeing association. In chapter four, to understand more accurately whether resilient coping or social support directly affected and partially mediated the relationships between exposure and outcomes, mediation analyses were

conducted. All analytical procedures were conducted using SAS statistical software package, version 9.4.

Results consistently revealed COVID-19 has had substantial psychological impacts on the mental health of university faculty, staff, and students including increased depression, anxiety, perceived stress, and loneliness. There seems to be evidence of groups that experience higher increased odds of poor mental health outcomes including but not limited to cisgender women, those who perceive themselves to be most lonely, and those who did not engage in physical distancing. Perception of the degree of coping was one of the two the strongest predictors of severe anxiety symptoms (OR: 6.82; 95% CI: 4.16, 11.19), depression symptoms (OR: 6.41, 95% CI: 3.96, 10.36), and high perceived stress (OR: 3.11; 95% CI: 1.98, 4.89). The second study also revealed that those who did not engage in physical distancing had increased odds of severe depression symptoms (OR: 1.33; 95% CI: 0.88, 2.00) and severe anxiety symptoms (OR: 1.37; 95% CI: 0.89, 2.09); but not higher perceived stress (OR: 1.04; 95% CI: 0.66, 1.64). This relationship was modified by past exposure to community trauma. While those who reported higher perceived stress had over three times the odds of severe anxiety (OR: 3.69. 95% CI: 2.65, 5.14) and over 11 times the odds of severe depression symptoms (OR: 11.10; 95% CI: 7.39, 16.67), the relationship was not mediated by past exposure community trauma or resilient coping. To the best our knowledge, this dissertation was the first to focus on depression, anxiety, and perceived stress among an entire university community in the Southeast U.S. within the context of the ongoing COVID-19 pandemic. At this time, it is also the first in the U.S. to investigate the potential mediating effect of resilient coping using the BRCS on this population.

There are a number of public health implications given the results of this dissertation. For example, this pandemic's impact on mental health requires an understanding to have better

dissemination of tools to help individuals to cope and to know when, how, and where they need to seek additional help. Moreover, future studies need to explore why particular groups are more vulnerable to experiencing poor mental health outcomes such as anxiety, depression, and perceived stress. Additional studies are also needed to understand how various mediating factors such as perceived social support and resilient coping affect mental health outcomes given that these factors are potentially modifiable. Collectively, this study presents an understanding of the significant psychological impact that the COVID-19 pandemic has had on this university community. It suggests this population requires collaboration between the community and the university administration to provide greater attention and support in the form of high quality and timely services and preventive measures to minimize the likelihood of poor mental health outcomes, particularly in those higher risk groups, now and in the future.

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LIST OF ABBREVIATIONS

BRCS	Brief Resilient Coping Scale
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
COVID-19	Coronavirus Disease 2019
GAD	Generalized Anxiety Disorder
GAD-7	General Anxiety Disorder 7-item Scale
H1N1	Influenza A virus subtype H1N1
HIV	Human Immunodeficiency Virus
IRB	Institutional Review Board
MDD	Major Depressive Disorder
MSPSS	Multidimensional Scale of Perceived Social Support
NC	North Carolina
NHOPI	Native Hawaiians and Other Pacific Islanders
OR	Odds Ratio
PFA	Psychological First Aid
PHQ-9	Patient Health Questionnaire 9-item Scale
PSS-10	Perceived Stress Scale-10
PTSD	Posttraumatic Stress Disorder
SARS	Severe Acute Respiratory Syndrome
SAS	Statistical Analysis System
UN	United Nations
UNCC	University of North Carolina at Charlotte
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

Terminology

The terms mental health outcome, psychological impact, and psychological well-being have been used in various literatures across the fields of mental health, psychology, sociology, nursing, and disaster mental health. However, the CDC states that [psychological] well-being is an outcome more meaningful to the general public (Centers for Disease Control and Prevention, 2018; Full Frame Initiative, 2015). Well-being has been associated with self-perceived health, healthy behaviors, mental illness, and social connectedness (the degree to which an individual has or perceived a sufficient number or diversity in their relationships to give or receive support) (Centers for Disease Control and Prevention, 2018). Some researchers and practitioners believe that the aforementioned terms (mental health outcome, psychological impact, [lack of] psychological well-being) are synonymous and can be used interchangeably; while others suggest that they differ as there are major conceptual and operational differences. For the purposes of this study, the terms are synonymous and describe the overall outcome of interest, psychological wellbeing. Psychological wellbeing was measured via three indicator outcomes – depression symptoms, anxiety symptoms, and perceived stress. Psychological wellbeing refers to an individual's emotional, social, and psychological state, and not merely the absence of a mental illness or symptomology.

Research Question & Purpose

The overall research question of this study is "What impact has COVID-19 had on the psychological wellbeing of faculty, staff, and students at a public American research university?" The impact on psychological wellbeing was examined via the presentation of symptoms of depression, anxiety, and stress. The researcher is particularly interested in sociodemographic factors that increase susceptibility of experiencing negative psychological impacts; in the

association between physical distancing and psychological wellbeing; and, in the relationship between perceived stress and anxiety and depression symptoms. The study was used to inform campus community interventions based on specific real and anticipated needs of this unique population. The field of public health needs to rapidly respond to the public mental health need that has risen because of COVID-19. In order to do that for this vulnerable population, it is imperative to first understand perceptions and the psychological and social experiences of university community members related to physical distancing, isolation, and stress.

Background

Worldwide, an average of one disaster occurs per day (Goldmann & Galea, 2014). In fact, more disasters or catastrophes affect people worldwide than are publicized (Aldrich & Meyer, 2015). The World Health Organization (WHO) defines disaster as "an occurrence that disrupts normal conditions of existence (Organization, 2020). The United Nations (UN) defines a biological disaster as one being "conveyed by biological vectors" such as bacteria, viruses, or mosquitoes carrying disease-causing agents. Thus, the pandemic resulting from infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and resulting coronavirus disease 2019 (COVID-19) from the infection may be classified as disaster (Wannous, 2017). As a disaster, COVID-19 has affected six continents, 213 countries and territories, and has been deemed a global pandemic. The impact of disasters is often measured by the number of deaths or injuries, the magnitude of devastation to a community's physical or built infrastructure, or the total cost of damages. Rarely is the impact of disasters measured by the emotional wounds and psychological impairment it leaves for its survivors. In the event of any disaster – manmade, natural, or biological – preparedness and early intervention can reduce and mitigate the risk of

detrimental psychological impacts and increases the potential for returned level of functioning (Galea, 2017; Galea et al., 2005).

COVID-19

COVID-19 is an infectious disease that first occurred in Wuhan, China in December 2019. It is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and is said to potentially infect the brain or cause immune responses that generate further physiologic and psychologic effects (Holmes et al., 2020). COVID-19 has spread throughout the world and become a global health emergency, declared a pandemic by the WHO on March 11, 2020 (Centers for Disease Control and Prevention, 2020a; Ducharme, 2020). Currently, the world is dealing with one of the worst viruses in history as a result of its "high infectious fatality rate, reproduction number, environmental viability, and diversity" (Tull et al., 2020; Yum, 2020). Since April 17, 2020, the United States (U.S.) has had the highest number of confirmed patients and deaths among all other countries with approximately 25% of the world's confirmed cases and deaths. At the time of this study, the pandemic had no signs of slowing down, particularly with many states reopening in phases, many of which were removing mask and social distancing mandates. The world had begun to see a second surge in the number of COVID-19 related deaths and cases; and several states either extended their current phases or reversed back to Phase 2 operations (The New York Times, 2020).

Currently, the severe economic, environmental, and social effects of the COVID-19 pandemic are being felt across the world. Parallel to previous biological disasters, such as the first pandemic of the 21st century – the 2003 SARS outbreak which caused over 8,400 cases in 29 countries – the global economy is suffering its worst crisis in decades (Chan et al., 2009; Cherry & Krogstad, 2004). Globally, as of April 21, 2022, there were 504,079,039 confirmed

cases and an estimated 6,204,155 deaths; in the U.S., 79.9 million cases were confirmed, and an estimated 981,834 deaths had been reported (Organization, 2020). For those who are infected, the cost of being treated in the hospital ranges from $10,000 to $20,000 with employer insurance and no complications(Abrams, 2020). Yet, 5.4 million Americans have lost their health insurance because of a loss of job or income (Stolberg, 2020).

During the height of the pandemic, the U.S. was experiencing many challenges in almost every aspect of American life. Hospitals were struggling to keep staff safe with proper protective equipment. Millions of people were being asked to shelter in place for the first time in their lives and practice social distancing. Some parents were working from home and forced to attempt a secondary job of homeschooling. Furthermore, at the time of the study, millions were out of work and filing for unemployment, with the unemployment rate at the time higher than any time in history since the Great Recession (December 2007 to June 2009) (Service, 2021). Financially, in 2020, the COVID-19 pandemic is estimated to have cost the U.S. economy an estimated $16 trillion (Cutler & Summers, 2020).

Mental Health

The WHO defines mental health as the “state of well-being in which every individual realizes [their] own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to [their] community” (Organization, 2014). Mental health is composed of various factors from individual to interpersonal to social/cultural or environmental. Individual factors that influence mental health may include genetics, independence, self-esteem/self-confidence, how one perceives/makes sense of the world, emotional resilience, capacity for growth, sense of belonging, and ability to cope or manage stress (Videbeck, 2013). Interpersonal factors may include ability to communicate effectively

with others, ability to help others, a sense of connectedness and separateness from others, and intimacy (Videbeck, 2013). Social/cultural or environmental factors may include a sense of community, access to adequate resources, positive and realistic view of the world, and support of diversity and representation among people (Videbeck, 2013).

Mental health disorders (also known as mental illnesses) include depression, anxiety, bipolar, schizophrenia, and substance dependency. These disorders affect mood, behavior, and thinking – both their biological ability as well as their thoughts and perceptions (Lebowitz & Ahn, 2014; Syme & Hagen, 2020). The most common of these disorders are depression and anxiety. Many people experience "sub-threshold" disorders, where their symptoms do not meet the clinical criteria for diagnosis of mental health disorder. The U.S. Department of Health and Human Services estimated in 2011 that an estimated 26% of adults in America will have a diagnosable mental health disorder in any given year (Office of Disease Prevention and Health Promotion, 2020). Today, 1 in 5 adults in American experience mental illness each year with 1 in 25 U.S. adults experiencing serious mental illness (e.g. major depression) each year (Health, 2008). There is a higher prevalence in women (22.3%) compared to men (15.1%) with young adults (ages 18-25) having the highest prevalence of mental illness (Health, 2020). More than 10 million adults have unmet needs for mental health treatment, a number that has not declined since 2001 (Illness, 2019). Among adults (aged 15 to 44) in the U.S., the leading cause of disability is mental illness (Videbeck, 2013). Serious mental illnesses (e.g. major depressive disorder, schizophrenia, bipolar disorder) alone lead to an estimated $193.2 billion in lost earnings ear year in the U.S. economy (NIH, 2008), exceeding the economic burden caused by all cancers (Videback, 2014). These lost earnings occur as these individuals are unable to find or be employed or contribute to the economy because of their serious mental illness(es). Moreover,

the proportion of individuals who get the level of care required by their condition is inadequate with 12.2% of adults (5.3 million) with a mental illness uninsured, and 56.4% of adults with a mental illness receiving no treatment (estimated 24 million individuals) (Illness, 2019).

Mental Health in Disasters

Disasters threaten harm or death to a large number of people, cause disruption of services and social networks, and involve physical and mental health sequalae or outcomes (Goldmann & Galea, 2014). In a large U.S. community study, researchers found that 13-19% of adults, in general, experience a disaster in their lifetime (Goldmann & Galea, 2014). The prevalence estimates vary across disorders due to disaster type, exposure, measurement, sampling design and study population (Goldmann & Galea, 2014). That being said, physical health and death contribute to a small fraction of the health burden post disaster. Mental and emotional impairments can be long lasting and debilitating.

Posttraumatic Stress Disorder. Of the most prevalent mental health disorders after a disaster, post-traumatic stress (PTSD) is the only disorder that requires a traumatic event prior to clinical diagnosis which lends itself to be the most studied disorder following disasters (Goldmann & Galea, 2014). There are three major components to clinical presentation and subsequent diagnosis of PTSD – reexperiencing the event with recurrent and intrusive thoughts (flashbacks), memories or dreams; showing emotional detachment or numbing (avoidance); and experiencing hyperarousal (being on guard or irritable) – all of which last for at least one month (Association, 2013; Videbeck, 2013). An estimated 40% of direct victims, 20% of rescue workers, and 10% of the general population are diagnosed with PTSD resulting from a trauma?

Major Depressive Disorder. One of the most common mental illnesses in the general U.S. population, Major Depressive Disorder (MDD) is diagnosed when an individual

experiences sadness and loss of interest in things they previously enjoyed (anhedonia), in addition to several other symptoms such as irritability, changes in appetite or sleep, and difficulty with memory and concentrating – all of which last for at least two weeks or longer (Association, 2013). MDD is the second most commonly studied and the most commonly occurring mental disorder following disasters (Goldmann & Galea, 2014).

Substance Use Disorders. Substance use disorders occur when alcohol or drug use inhibits one from fulfilling work, home life, school, or legal obligations and result in difficult relationships, engagement in dangerous situations, increased tolerance and occasions of withdrawal, and the inability to successfully quit with or without help (Association, 2013; Goldmann & Galea, 2014). Over 14 million Americans have an alcohol use disorder (National Institute on Alcohol Abuse Alcoholism, 2022). This use disorder alone accounting for 232 million lost days of work annually (Parsley et al., 2022). Substances can include alcohol, sedatives, hypnotics, anxiolytics, stimulants, cannabis (marijuana), opioids, hallucinogens, and inhalants. In the context of disaster, substances are often used as coping strategies. This was seen following 9/11 Attacks, Oklahoma City Bombing, Hurricane Katrina, and currently, during the COVID-19 pandemic (Goldmann & Galea, 2014).

Other Symptomology and Disorders. Several studies have found increased prevalence of generalized anxiety disorder (GAD), panic disorders, death anxiety, suicidality, and prolonged grief disorder (Goldmann & Galea, 2014). While normally a means to function as a motivating factor or an internal signal of danger, anxiety disorders affect an individual's daily functioning and well-being. For instance, an individual with a clinical diagnosis of GAD worries excessively and feels highly anxious at least half of the time for at least six month with symptoms such as

uneasiness, irritability, fatigue, muscle tensions, or difficulty thinking and concentrating (Association, 2013; Videbeck, 2013).

Not all who experience a disaster will experience mental health disorders. Often, individuals will have physical, social, and emotional needs during and following disasters. After physical safety and wellness have been attended to, emotional support becomes more salient (Dieltjens et al., 2014). Emotional needs may be disguised by somatic symptoms – difficulty falling asleep (insomnia) or staying asleep, headaches, fatigue, back pain, chest pain, nausea or indigestion, abdominal pain or discomfort, shortness of breath, or pain (Goldmann & Galea, 2014; Videbeck, 2013).

Social Determinants of Mental Health (Risk Factors for Psychological Impact)

An estimated half of the U.S. population is considered vulnerable because of current social circumstances; these individuals considered vulnerable face an increased number of stressors before a disaster occurs (Martin, 2015; Moore et al., 2004). Across the literature, a wide variety of determinants have been found to influence individual vulnerability and mental health outcomes, such as level of education, income, employment status, social support, the physical and social environments in which one lives, gender, age, access to healthcare, ethnicity, and low literacy (Biedrzycki & Koltun, 2012; Lindsay, 2003; Louissaint, 2017; Martin, 2015; Najafi et al., 2015). These determinants lead to disparities and disproportionately limited access to services, less desirable health outcomes, and decreases the individual's ability to adapt to, respond to, or control life's challenges and changes, such as those that may occur before, during, or after a disaster (Lindsay, 2003; Louissaint, 2017). The disparities are a cumulative result of social factors that exist prior to a disaster and may even be exaggerated during and after a disaster (Lafronza & Burke, 2007).

Pre-disaster. Prior evidence has shown that a history of mental illness or problems, female gender, minority ethnic status, low socioeconomic status, younger age, low social support, being single, having children, and having experienced a traumatic or stressful event prior to the disaster are risk factors for experiencing mental illness or symptomology post disaster (Goldmann & Galea, 2014). Older age has been shown to be a protective factor for depression, substance abuse, and PTSD, while middle aged adults have the greatest risk for experiencing disorder or symptomology (Goldmann & Galea, 2014).

During Disaster. The primary risk factor for development of a mental disorder or symptoms after a disaster is the degree of exposure during the disaster. Media exposure is also considered part of the degree of exposure, although indirectly. Greater or more intense exposure during a disaster has been linked to higher risk of symptomology following the disaster (Goldmann & Galea, 2014). The risk for developing symptomology post-disaster increases with the number of traumatic events experienced during the disaster and in one's lifetime. During the COVID-19 pandemic, impacts presented in the form of distress, anger, depression, anxiety, noncompliance with public health measures, and panic attacks (Ettman et al., 2020; Goldmann & Galea, 2014; Peng et al., 2020; Pfefferbaum & North, 2020; Piltch-Loeb et al., 2021; Rudenstine et al., 2021). Currently, living with an individual who is diagnosed with the disease (COVID-19), being a caretaker of someone with the disease, having a close friend or family member diagnosed with the disease, or having the disease itself would be considered high degrees of exposure. For subpopulations at increased risk, such as the university community, prolonged distress may start to present with anxiety and trauma related disorders, similar to the SARS and H1N1 outbreaks (Fiorillo & Gorwood, 2020; Tull et al., 2020). The longer the duration of this current pandemic, the higher likelihood of poor mental health (Charlton, 2020).

Post-disaster. Based on the literature, there are two primary risk factors for mental health disorders or symptomology during the post-disaster time frame – life stressors, such as financial strain, job loss, relationship stress, physical health conditions, and displacement, and social support, especially perceived social support (Goldmann & Galea, 2014). When an individual's social networks and support are disrupted, reduced in size or quality, or eliminated, there is an increased risk in experiencing a range of mental health disorder (Littleton et al., 2009; Norris et al., 2002).

Mental Health in COVID-19

COVID-19 has negatively affected the mental health of many while also creating barriers to access to mental health services. While not everyone will experience clinical symptomology, the majority of people will worry and stress related to any number of aspects of the disease. The greatest concern of public mental health researchers is the increased risk for anxiety and depression. as well as associated outcomes such as suicide and increased substance use. Evidence shows that social isolation can increase psychiatric symptoms (Panchal, et al., 2020). Yet, at the time of this study, federal and local governments, including public health departments and individuals alike have turned to physical distancing (often called social isolation or social distancing), as an important strategy to stop the spread of a novel virus, because, at this time physical distance from potential exposure is a known approach to successfully slow the spread.

From a public health perspective, there is a strong justification for physical distancing to mitigate the spread (Tull et al., 2020). At the time of this study, physical distancing and quarantine were the only historically successful means that the public had to prevent the spread of the virus and to "flatten the curve" – to underwhelm our healthcare system that was severely struggling at the now (Banerjee & Rai, 2020). At the time, this was the only means despite the

social and economic disruptions it may cause billions of individuals across the globe. While the purpose of physical distancing is to mitigate the spread of the virus and subsequent loss of life, the measure places many at risk of experiencing circumstances linked to mental illnesses such as isolation, financial distress related to lost income, feelings of uncertainty, and anticipatory grief (Panchal et al., 2020). Recent studies have found that the loss of social interaction, income, structure, and routine has led to psychological losses including loss of meaning, motivation, or self-worth among a range different people (gender, ethnic, age, and occupational backgrounds) (Williams et al., 2020)

Social Distancing and Terminology. The use of the term, social distancing, implies that individuals should disconnect and cut off meaningful and important relationships; and some people may indeed cut off social ties (University of Kentucky, 2020). Furthermore, it may have confused the public to socially isolate, to disconnect and that could not be more harmful during that time. The actions strongly recommended by public health officials are better suited for the term "physical distancing" as this what is needed, especially as it is well known that social isolation is a serious concern when it comes to self-worth, social support, and mental health (Anderson, 2020; University of Kentucky, 2020).

Terminology and language matter especially when a crisis is ongoing, especially when that terminology and language can affect the mental health of many. For instance, many executive orders stopped using the phrase "shelter in place" which is often associated with active shooter situations – something with which UNC Charlotte is still coping (Anderson, 2020). Additionally, previous epidemics have displayed that a lack of communication, disheveled or muddled communications, or inconsistency in communication to the public by public health

organizations (including the WHO) proved to cause obstacles in compliance thus deterring the containment of the virus spreading (DiGiovanni et al., 2004).

The term social distancing originates from social epidemiology and means “stay far enough away” from others to limit virus(es) spreading (i.e. CDC recommended for individuals to stay away from social meetings and keep 6 feet, or 2 meters, from other people.) (Anderson, 2020; Centers for Disease Control and Prevention, 2020b). Recently language has changed to promote that social epidemiology understanding to “Stay Together, Apart” or “Stay Apart, Stay Connected” to encourage people to socialize at a distance. The WHO was one of the first public health organizations to officially change its language to “physical distancing” in late March 2020 (Anderson, 2020).

On an individual level, the current pandemic has created unprecedented psychosocial impacts throughout the world. Following disasters, nearly 40% of direct survivors develop symptoms of Post-Traumatic Stress Disorder (PTSD), the most prevalent mental disorder following a disaster (Galea et al., 2020). For instance, after the 2003 SARS epidemic, clinical presentation of PTSD, stress, and psychological distress was noted in both patients and clinicians alike (Galea et al., 2020). The mental health impact of COVID-19, heightened by the public health measures taken by countries and communities, is obvious. However, there are few studies that provide significant or timely evidence to explain how or why the mental health impact is such, particularly not in the U.S. (González-Sanguino et al., 2020). International studies that have been published have found that anxiety and depression are the most prevalent (Brooks et al., 2020).

The literature on mental health outcomes and epidemics is often linked to the sequela of the disease rather than behavior changes that occur because of it (Galea et al., 2020). After

disasters of any kind, an increase in anxiety, depression, and stress are normal responses to stress. However, in the instance of COVID-19, there is a significant likelihood for the prevalence of clinical depression, posttraumatic stress, substance abuse, domestic violence, child abuse and similar mental and behavioral disorders (Galea et al., 2020; Holmes et al., 2020). To date, the proposed study is the first study in the scientific literature exploring the psychological impact of COVID-19 in a sample of university students, faculty, and staff in a U.S. population. Much of the current literature including studies of university populations has been conducted outside the U.S. (Cao et al., 2020; Du et al., 2020; Gandhi et al., 2020; González-Sanguino et al., 2020; Limcaoco et al., 2020; Odriozola-González et al., 2020; Sahu, 2020; Sartorao Filho et al., 2020; Ye et al., 2020; Zhai & Du, 2020).

Current Solutions

Mental Health Preparedness. Mental health preparedness is "a state of awareness and expectation of an individual's psychological reactions to the disaster warning and the ability to identify particular stress-related emotions and thoughts" (Roudini et al., 2017). Survivors will need medical, emotional, and social support in the aftermath of a natural disaster. Of paramount concern is physical well-being, immediately followed my emotional and social support (Dieltjens et al., 2014). Studies show that the majority of individuals will report psychological rather than physical complaints, such as difficulty eating or sleeping, headaches, gastrointestinal complaints, and chest pain (Babbel, 2010; Health, 2018). In the days, weeks, and months after, survivors may either (1) return to their previous level of functioning without mental health specialist, (2) experience symptomology of posttraumatic stress, or (3) experience posttraumatic growth. To accommodate the spectrum of survivor experiences, preparedness must anticipate the potential

emotions and thoughts of individuals prior to a disaster and be equipped to intervene as necessary after the disaster.

Psychological First Aid. Psychological first aid (PFA) is a culturally informed and supportive approach designed to help individuals in the immediate aftermath of disaster by reducing stress and fostering adaptive functioning and coping (Brymer et al., 2006). First conceptualized in the aftermath of 9/11, PFA has become the preferred post-disaster non-clinical intervention (Figueroa, 2015; Goldmann & Galea, 2014; Shultz & Forbes, 2014). Agencies worldwide utilize PFA including the International Federation of Red Cross and Red Crescent, the National Center for Post-Traumatic Stress Disorder, and the WHO. Currently, no studies demonstrate its effectiveness in any setting. An independent systematic review requested by The Advisory Council of the American Red Cross Disaster Services recommended further outcome research (Fox et al., 2012; Shultz & Forbes, 2014). Several studies have noted the need for studies of interventions that aim to prevent or reduce mental illness in disaster survivors as well as the need for effectiveness studies that evaluate how well these said interventions work with practicing clinicians. (Goldmann & Galea, 2014; Shultz & Forbes, 2014). Others have identified a monumental gap in literature regarding the effectiveness of psychological first aid (Figueroa, 2015; Fox et al., 2012; Goldmann & Galea, 2014; Shultz & Forbes, 2014; Uhernik & Husson, 2009). Despite its label as "evidence informed without proof of effectiveness," PFA has been continually used worldwide with manuals and training developed for specific fields and populations (Fox et al., 2012).

Research Aims

There are three primary aims to this study – 1) to explore how sociodemographic factors are related to the psychological impact of COVID-19 on a collegiate community; 2) to evaluate

the association between physical distancing and psychological impact, with past community trauma and social support as effect modifiers; and 3) to evaluate the association between perceived stress and depression and anxiety symptoms with resilient coping and social support as mediators of this relationship. The outcome of interest overall is psychological impact with depression, anxiety, and perceived stress as indicators of that impact. The exposures are sociodemographic factors, physical distancing (also referred to as social distancing), and perceived stress. Results of the study provide further knowledge about the psychological impact COVID-19 has had on this collegiate community, especially given that the vast majority of the community is unlikely to test positive and become ill; but rather to experience the negative impact this pandemic can have on individual mental health. This information may also inform university student and employee health services on college campuses and be useful for the design of future health intervention/prevention programs on college campuses.

Importance

Given the recent nature of this pandemic, research in this area is very limited across populations, particularly in regard to the psychological impact.Of those studies published on the psychological impact, outcomes are consistent with previous disaster related studies (Tull, et al., 2020). This pandemic provides us a prime opportunity to further our understanding and delivery of mental health needs and care of university communities. Given the uniqueness of this uncertain time and uncertain threat to our mental health, with physical distancing, isolation, and disruption of daily behavioral patterns resulting in loneliness, this study helps to prepare campuses throughout the country, to recognize that in the current climate and immediate aftermath, mental and behavioral illnesses will increase in prevalence and we need to be prepared.

Even those with resources and social connectedness will still struggle with stress which is perpetuated by mixed media messaging; uncertain and changing information, recommendations, and policies; academic deadlines and class structures rearranged; and ongoing cancellations and closings of anticipated events and local places – all of which remove any sense of normalcy. With campuses temporarily shut down or operating in a primarily remote capacity, traditional methods of coping or seeking help (i.e. therapy, school counseling center) were no longer available for some time. Even now, modalities have changed which may remove access to care – care which may now be limited, unavailable, or unsupported by the student, faculty, or staff members' new environment.

Significance

General Contribution. Members of the university community are a hidden population not considered vulnerable to the general population and likely not to be a primary group to be studied as compared to those who are health professionals, elderly, those with pre-existing chronic conditions, and young children (Centers for Disease Control and Prevention, 2021). But university students, faculty, and staff are just as likely as the general population to come in direct or indirect contact with someone who has been exposed to the disease and to be vulnerable to the biological or psychological stressors. In fact, prior to the pandemic, an estimated 10-20% of the student population experienced mental health problems at any given time (Kumaraswamy, 2013) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates now that half of the world's student population has been impacted by the pandemic, including by closures and restrictions (Araújo et al., 2020; Rahiem, 2021).

Additionally, this study contributes to the body of literature surrounding the Brief Resilient Coping Scale (BRCS). At this time, this is the first study in the U.S. to investigate the

potential mediating effect of resilient coping using the BRCS on this population – a university community including faculty, students, and staff. Many international studies have used this scale to measure resilience during this pandemic among various populations such as university students (Cosmas, 2020); older adults (Lopez et al., 2020) teachers (Obrad, 2020); people living with HIV (Ballivian et al., 2020); those with chronic physical and mental illnesses (Robillard et al., 2020); health care workers (Gandhi et al., 2020; Khalaf et al., 2020; Labrague & De los Santos, 2020; Robillard et al., 2020); parents with children (AL van Tilburg et al., 2020); and the general population (Planchuelo-Gómez et al., 2020; Rahman et al., 2020; Soonthornchaiya, 2020).

Originality. The University of North Carolina at Charlotte is a 4-year university within an urban city of Charlotte, North Carolina (NC). This may contribute as to why the majority of students live off campus rather than in a dormitory or residence hall located on campus. The university reports that over 6,000 students live on campus each year (UNC Charlotte Undergraduate Admissions, 2020). This means that most students did not live on campus before the pandemic began. Rather, they live in and around the city of Charlotte, which has been considered a hotspot during this pandemic (Fowler & Jasper, 2020). The members of the university are likely to come into contact with the virus, simply because of where they reside, work, or attend school. Moreover, at UNC Charlotte, the campus community is experiencing its third disaster in five years including the 2016 shooting of Keith Lamont Scott and the violence that ensued quickly afterwards, the 2019 campus shooting, and now the 2020 COVID-19 pandemic. Having experienced several disasters in a short period of time, this campus community is at an increased risk for poor mental health outcomes. Additionally, the literature supports the association between social isolation and loneliness to poor mental health outcomes

(Panchal et al., 2020). Every university community has stressors and challenges that will increase their community's susceptibility of experiencing the psychological impact of COVID-19 differently. This study simply accounts for this university community's unique and previous trauma (e.g. 2016 Shooting of Keith Lamont Scott and the 2019 Campus Shooting) as the primary factors that may contribute to the community's susceptibility. From this study, researchers and public health professionals was able to design and implement strategies which reduce the likelihood of poor mental health outcomes following disasters, especially among university students, faculty, and staff.

Field of Disaster Mental Health. Historically, psychiatric needs have been considered less important than physical needs (Ho et al., 2020). This incident is not unique in that sense. But any effects of the disease on the population are mediated through the pathophysiological, psychological, and behavioral reactions and mechanisms of the disease itself (Perrin et al., 2009). Currently, the fear of contracting the disease is worse than the disease itself for the majority of the general public who will not contract the disease. At this time, roughly 24% of the U.S. population have been confirmed to have COVID-19 and 65.1% of the population has been fully vaccinated. (Centers for Disease Control and Prevention, 2022a, 2022b; U.S. Census Bureau, 2022). This study intends to create attention for the potential mental health impact that the pandemic will have on university communities for years to come. It also serves as a demonstration of the need for short- and long-term interventions to be tailored for this vulnerable population based on evaluation and assessment (Chan et al., 2009). The need for mental health preparedness to be incorporated into action plans in light of an outbreak or pandemic has been documented as recently as 2009 after the SARS epidemic (Chan et al., 2009). A lack of planning

will only increase the psychological and social toll that this pandemic will have on this population.

Public Health. The WHO and World Bank Group reports mental illness associated costs to be $2.5 trillion in 2010 and is expected to increase to $6.0 trillion in 2030, more than the cost of any other non-communicable disease including cardiovascular disease and diabetes (Mnookin, 2016). This current climate has shed light on both the importance of and the underfunded and neglected public health in this country and around the world. The goal of public health is to reduce physiologic and psychologic morbidity and mortality. One way or another, this crisis has emotionally impacted most everyone as it presents itself in unexpected ways and times. Those in the collegiate community with pre-existing mental health issues and those who are already marginalized by society (i.e. race, gender, or sexuality) may be especially affected by the COVID-19 pandemic. Unlike any epidemic before, these changes in our lives have created significant negative social and psychological effects in a short amount of time in many people. Its impact on mental health requires an understanding to have better dissemination of tools to help individuals to cope and to know when, how, and where they need to seek additional help.

Assumptions

Mental health distress is assumed to exist in varying numbers across the general population. Evidence from previous disasters (i.e. Deepwater Horizon Oil Spill, Exxon Valdez spill, Hurricane Katrina, 9/11 Attacks) have shown increases in negative psychological impact in calls to domestic violence hotlines, increased prevalence of mental illnesses, substance abuse, theft, and assault following disasters (Yun et al., 2010). This disaster differs from previous disasters as this disaster is not localized or set for a specific area or time; people are unable to escape or evacuate even if they had the means; and, unlike manmade disasters, there is no

"enemy" as all human begins beings are capable of transmitting the disease to others (Fiorillo & Gorwood, 2020).

Conceptual Framework/Model

Social Determinants of Mental Health

The Social Determinants of Mental Health conceptual framework, as shown in Figure 1a, incorporates the social and cultural determinants of mental disorders with the United Nations Sustainable Development Goals endorsed in 2015. The idea of the framework was to visually demonstrate the multidimensional way that the social determinants affect mental health, especially because there is mounting evidence that mental illnesses and disorders are at least partially determined by the social environment (Lund et al., 2018; Rutter, 2002). The framework was composed as part of a study whose purpose was to develop the conceptual framework and then to systematically review social determinant of mental disorder literature. Lund et al. (2018) note that much of the literature does not include low- or middle-income countries; so this framework includes the socioeconomic factors that, if targeted, could mitigate the likelihood of mental illness in low, middle, and high income countries. Social determinants of mental health are the social and economic circumstances that both influence the occurrence, prevalence, and severity of mental illnesses and disorders (Lund et al., 2018).

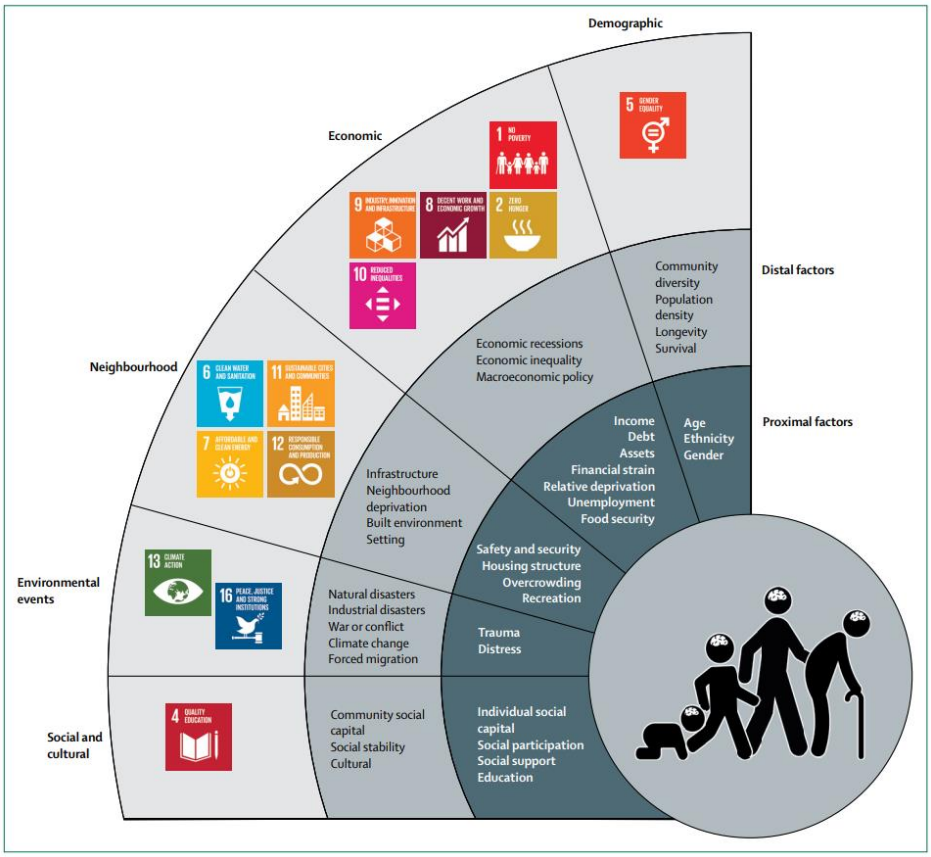

Figure 1a. Social and Cultural Determinants of Mental Disorders and the Sustainable Developmental Goals: a conceptual framework

Factors (Upstream/Downstream). Nodding to Bronfenbrenner's ecological approach, the framework includes proximal factors and distal factors. Proximal factors will often mediate the effect of distal factors on the individual. But, family level and biological variables like genetics will mediate both types of factors. Proximal factors are the people, places, and events in an individual's immediate environment that upon interaction will directly affect the risk of mental disorders (Lund et al., 2018). In public health, these are considered the downstream factors. Distal factors are the broader trends in society that exert influence over mental disorders in the general public (Lund et al., 2018). In public health, these are upstream factors – those which when intervened on would affect a greater number of individuals as they are "root causes" of health.

Determinants. For the purposes of this study, the focus was on factors (determinants) from four of the five domains of determinants – demographic, economic, environmental, and social and cultural. This study acknowledges the role of the neighborhood domain, particularly that individuals who live in an urban environment is at increased risk for mood and anxiety disorders, especially as community level violence has been linked to PTSD (Center, 2017). All the domains include characteristics or factors that suggest risk or protection from mental disorders. It should also be noted that the systematic review of relevant literature found overlaps and interrelatedness of the concepts in each domain when the same articles were found during each of the unique domain searches (Lund et al., 2018).

Demographics. The demographic domain contains specific demographic characteristics. Proximal examples are gender, age, and ethnicity. For instance, female gender is linked to an increased risk for depression and anxiety, while male gender is associated with increased likelihood of successful suicide. A distal example is community diversity or population density.

Economic. The economic domain includes factors related to wealth that may increase risk for poor mental health. Examples of factors related to production, consumption, and transfer of wealth include income, income inequality, debts, employment status, housing, recessions, and subjective financial difficulties. For instance, poverty has been linked to increased prevalence of depression and anxiety; and lower socioeconomic status and unemployment have been associated with suicidal ideation (Lund et al., 2018). It should be noted that the link between poverty and mental illness is “complex and bidirectional” related to social causes and influences across the life course (Lund et al., 2018).

Neighborhood. The neighborhood domain contains characteristics of an area that suggest the risk of mental illnesses and disorders that is “over and above what is attributable to the

individual" (Lund et al., 2018). Key factors include urbanicity, community violence, social cohesion, crime, and exposure to violence or disempowerment. Place can mean space or location.

Environmental Events. This domain embodies serious events or occurrences that exceed a community's ability to cope with the outcomes with their own resources. Examples of factors in this domain include trauma, distress, adversity, disasters and climate change, and loss of social support systems. Risk factors for experiencing a mental disorder or impairment include characteristics in other domains such as female gender, single, younger or older in age, low socioeconomic status, lower education, identifying as a minority, and unemployment. It also includes one's level of exposure to the event (e.g. the level of exposure to COVID-19).

Social & Cultural. This domain encompasses the way that society, including social interactions and various relationships can affect the risk of mental disorders. This includes factors such as quality education, social capital, and social support. Social support is a key protective factor in this domain. It is linked to decreased prevalence of depression (Lund et al., 2018). Studies show that individuals who live in communities that have high levels of existing social support are more likely to have lower levels of psychological impairment (i.e. PTSD, depression, anxiety) post disaster (Wind & Komproe, 2018). Social support can also influence one's health via social norms. For instance, prior to Hurricane Andrew, the Vietnamese community in New Orleans, Louisiana collaborated with the local Catholic churches which many of the Vietnamese community belonged to prepare for the storm. Post disaster (BP Oil Spill), designated people went out in the community to check on particular people, especially the elderly. The community also met together to help one another rebuild their boats using skills they

learned back at home (Vietnam) and in their work in the States in the fishing industry. Social support is one of the determinants that can serve as a buffer to poor mental health outcomes.

Application to Current Study. The Social Determinants of Mental Health are interesting in the context of disasters and social vulnerability. These determinants, which place people at greater risk for psychological impairment (as well as physical harm), do not appear only after the disaster occurs. Many of these determinants did not come into effect because of COVID-19. Rather, these determinants, which make these individuals vulnerable on any given day, are only accentuated or compounded when a disaster occurs. Due to the cross-sectional nature of this study, it is impossible to confirm temporality. Longitudinal studies would be ideal instead. This was acknowledged in the limitations. For now, it is noted that the determinants are accentuated or compounded when a disaster occurs. Therefore, it is imperative that communities, such as UNC Charlotte, are aware of the potential sociodemographic factors that place people in their community at greater risk for psychological impairment from the impact of COVID-19. The domains and factors from this framework that are incorporated include the demographic domain (gender, age, and ethnicity), the economic domain (employment, income, and housing), the environmental event domain (trauma, distress, and disaster), and the social and cultural domain (social capital and social support). It is important for these root causes of health to be addressed to increase overall community psychological wellbeing. Psychological wellbeing is conceptualized as low depression, low stress, and low anxiety. The goal is to reduce potential or existing psychological impairment from the biological disaster. As shown in Figure 2a and 3b, simplified conceptual models are presented to highlight the relationships drawn from the Social Determinants of Mental Health Framework.

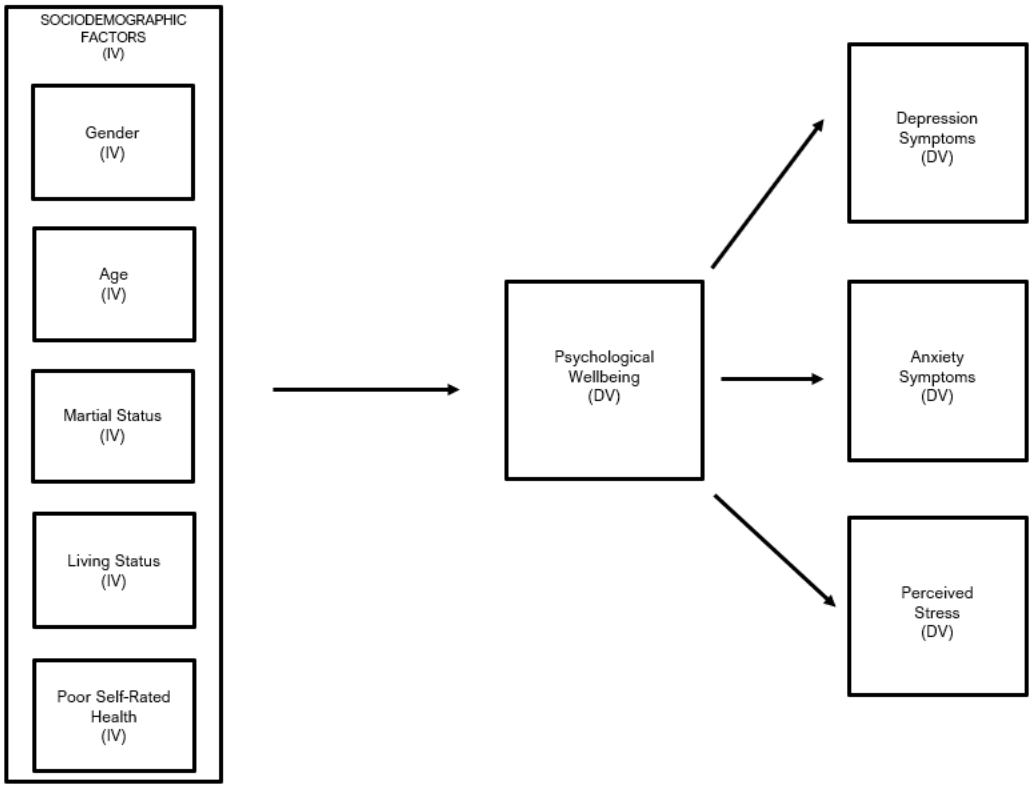

Figure 2a. Conceptual Model of Association Between Sociodemographic Factors and Psychological Wellbeing

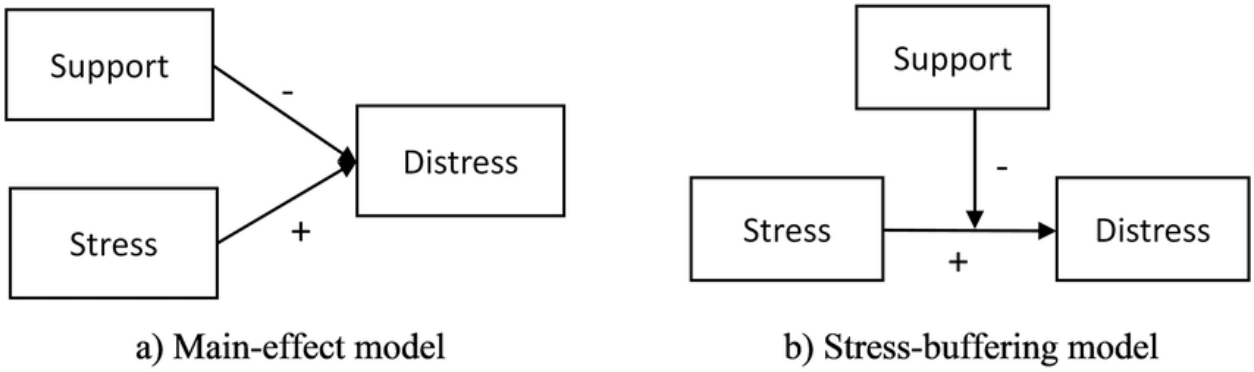

Figure 3a. Models of the relationship between social support and mental health outcomes ((Cohen & Willis, 1985))

Social Support

There is evidence for social support, typically measured by a validated tool such as the Multi-dimensional Scale of Perceived Social Support, to be a benefit in reducing poor health

outcomes. This is done either by promoting health behavior to reduce stress (main effect model) or as a buffer from the experience or perception of stress (buffering model) (Cohen & Wills, 1985). Stress, typically measured with a stress scale such as the Perceived Stress Scale, is a process whereby environmental demands cause strain on an individual's capacity to adapt which results in psychological and biological changes – potentially increasing an individual's risk for illness (Cohen et al., 1995). These models are not considered mutually exclusive of one another; but serve to explain how perhaps the structural aspects (i.e. social networks and integration) are likely explained by the main effect model, while the functional aspects (i.e. perceived social support) are likely explained by the buffering hypothesis/model.

Main Effect Model. The main effect model, as shown in Figure 3a, explains social relationships as being beneficial to the individuals regardless of whether they are under stress or not (Cohen & Wills, 1985; Kawachi & Berkman, 2001). In the model, stress is considered a normal response or reaction to environmental or internal stressors; and can be adaptive in nature. Distress is considered to be severe or prolonged stress and is an emotional state when an individual is unable to adapt to stressors. This can occur via social influence – how being a part of social network can influence what is considered normative behavior – or via being involved in a social network which then provides increased likelihood to access multiple different forms of support. Social networks provide social support which can improve health. It may be defined as "linkages between people that may or may not provide social support" or serve other functions (Glanz et al., 2015). Theories based in social network help to explain how and which social relationships provide different types of support (Glanz et al., 2015). It should be noted that it is possible to be a part of social network and not receive or perceive social support. It also possible

to receive or perceive social support and not be part of a social network. This is because a social network by definition are the linkages that may or may not provide social support.

Buffering Hypothesis/Model. The buffering model, as shown in Figure 3a, explains social relationships and connectedness as a modifying factor and only related to wellbeing when the person is under stress and not so much if they are in eustress (Cohen & Wills, 1985; Kawachi & Berkman, 2001). In this model, social relationships provide resources such as information, emotional support, or tangible resources which promote behavior changes or neuroendocrine responses to stressors like illness or life events/transitions (Holt-Lunstad et al., 2010). Social relationships buffer the negative influences that stressors may have on health and can act on various points in the pathway between a stressful event and mental illness. Social support is a function of social relationships and can be defined as the actual or perceived resources provided in the context of a relationship. This social support can be separated by type: material/financial (also known as instrumental), emotional, appraisal, or informational. Social support is "those social interactions or relationship that provide individuals with actual assistance or that embed individuals within a social system believed to provide love, caring, or sense of attachment to a valued social group or dyad;" in other words, it can be the real or perceived availability of social resources (Hobfoll, 1988; Holt-Lunstad et al., 2010). For example, when under stress, having the perception that support is available may buffer the full impact of stress by increasing the individuals "coping abilities" (Kawachi & Berkman, 2001).

Resilient Coping. One such coping ability may be resilient coping. Resilient coping occurs as a process when an individual copes with stress in a "highly adaptive manner" that demonstrates active problem solving and flexible coping (Kocalevent et al., 2017; Sinclair & Wallston, 2004). The concept originated by Polk's (1997) model of Patterns of Resilience in

which she identified 26 “cluster[ed]” patterns of resilience, including dispositional patterns (personal attributes that serve as protective factors). Based on Polk, resilient coping is a “tendency to effectively use cognitive appraisal skills” despite difficult and stressful events or situations (Sinclair & Wallston, 2004). These potentially “creative, adaptive problem-solving abilities” may serve to protect an individual from the negative effects of stress, including poor psychological wellbeing (Sinclair & Wallston, 2004). The relationship between resilience and depression and anxiety has been noted in prior literature (Cheng, 2001; Waugh & Koster, 2015). This is because the more individuals perceive stress during this time, the more anxiety or depression symptoms they may have, generated because of their lack of ability to respond adaptively and recover from those additional stressors. Resilient coping is one way that can buffer the adverse effects of stress.

Social Support. Research has demonstrated the importance of social support in mental health (Parks, 2020; Zuercher et al., 2020). Social support can connect people to resources and support in coping. COVID-19 is a disaster that like many others before bring people together over a shared and possibly traumatic experience. Yet, people are being asked to share that experience while isolating, quarantining, and physically distancing themselves from those whom they would usually cling to for support during or after a difficult experience. By encouraging a more positive appraisal of the situation, social support can reduce negative emotional, physiological, or behavioral responses to stress (Kawachi & Berkman, 2001). Research has shown that we do not need to be physically close to experience the benefits of social support. Rather, perceived social support is a stronger indicator of positive mental health outcomes. The feeling or perception of being cared for or connected mediates the long-term effects on distress experiences (Kawachi & Berkman, 2001; Norris & Kaniasty, 1996; Parks, 2020). Research also

supports the notion of perceived social support as a modifiable factor which validates the development of public health interventions that increase perceived social support (Zuercher et al., 2020). Unlike previous biological disasters where isolation and quarantine were encouraged, we have technology and social media platforms to stay socially connected as much as possible while being sensible and safe (Tull et al., 2020; Welch, 2020). At this time, it is highly encouraged for individuals to engage in digital technology such as video chatting via Zoom, Skype, or other platforms to stay socially connected to others and reduce loneliness or separation.

Social Networks. During this pandemic, our ties and bonds with our networks and support have been strained. A groundbreaking study found that the likelihood of dying as nearly 50% more likely for people weak social ties as compared to those with strong ties (Holt-Lunstad et al., 2010). Social support was also a stronger predictor of death than the effects of physical inactivity and compared weak social ties to placing one at risk similar to smoking 15 cigarettes per day (Anderson, 2020; Holt-Lunstad et al., 2010). There is an increased likelihood of engaging in a behavior, such as physical distancing, mask wearing in public, or seeking mental health help, when individuals in your social network are also engaging in said behavior (Cao et al., 2020; Van Bavel et al., 2020). Engaging in a behavior because of individuals in your social network is referred to as social influence (Kawachi & Berkman, 2001). Social influence occurs similarly for positive or maladaptive coping behaviors in response to COVID-19. This influence can be attributed to many things, including collective will. Collective will is powerful, the entire world has essentially stopped traveling, socializing in person, and begun working and learning primarily from home in order to reduce the spread of the novel coronavirus. In a study conducted shortly after the 2003 SARS epidemic, the general population reported complying with

quarantine or public health interventions because of the "protection of the community" rather than the fear of penalties (DiGiovanni et al., 2004). Collective will, seen with strong social ties, can also form into contagion – emotionally charged collective mind that can threaten the safety and security of the public (Perrin et al., 2009). In a positive sense, social influence in a network can produce a sense of purpose, belonging, and security which may result in individual positive psychological wellbeing (Kawachi & Berkman, 2001).

Ties. Decades of research has clearly established the association between social ties and mental health (Kawachi & Berkman, 2001). Some studies find that immediately post or during the event, bonding ties are key; some studies have found that bridging ties are paramount for accessing information and supplies (Aldrich & Meyer, 2015). Being a part of a broader social structure such as a community organization or intimate relationship(s) can also increase an individual's access to several sources of support which can directly protect them from stress (Kawachi & Berkman, 2001). It should be noted that social ties are not evenly experienced as beneficial to all people and varies with factors such as race, gender, and socioeconomic status (Kawachi & Berkman, 2001). Compared to men, women generally tend to experience higher rates of psychological distress but have more emotionally intimate relationships which may increase or decrease opportunities to be exposed or mitigate stress, use more social supports when stressed, and exchange more effective social support more often when others are experiencing stress but may not receive the same support which may result in depression or sadness (Kawachi & Berkman, 2001). Disaster mental health is not defined solely by the individual's characteristics but also the community in which they live. Individuals may attempt to cope on their own to decrease distress and this can be moderated by social networks when effectively employed. The challenge in disasters is that individuals are often displaced and

relocated – or in the case of COVID-19, are having to be physically distant – thus social support via these strong ties may dissipate temporarily or permanently causing social upheaval.

Application to Current Study. It is known in public health that individual attributes are not solely responsible for one's health outcomes. Instead, the social and built environment play a large role in health outcomes. In this study, the following is assumed, based on the literature: (1) that strong social networks are important to psychological wellbeing. More specially, that perceived social support is a buffer of poor mental health outcomes; (2) the social network's built environment or physical closeness– examined by looking at physical distancing – can play a role in supporting and encouraging stronger ties, thus reducing the likelihood for poor mental health outcomes and encouraging health behavior within social networks. This study assumes close proximity means that you are more likely to recognize and use those resources provided by your social network to reduce your stress. A community with high social cohesion requires less demand for the individuals in the community to use their own psychosocial resources as the people will rely on social context (social support) to address their needs and may not need to use individual strategies to address particular needs. Post disasters, individuals in these networks (i.e. community) may perceive they have more resources available to cope with the disaster-related stressors; so that when they do use individual strategies to deal, they use them more effectively; (3) that stress can directly or indirectly, through reduced resilient coping, increase the likelihood of anxiety and depression symptoms in this population during the pandemic. In other words, resilient coping – one of many coping abilities – serves as a buffer. It is important for the role of social support to be examined and understood to increase overall community psychological wellbeing so that individuals are able to rely more on the social capital that already exists to reduce potential or existing psychological impairment from the disaster. As shown in Figure 4a

and 5a, simplified conceptual models are presented to highlight the relationships drawn from the Social Support Models.

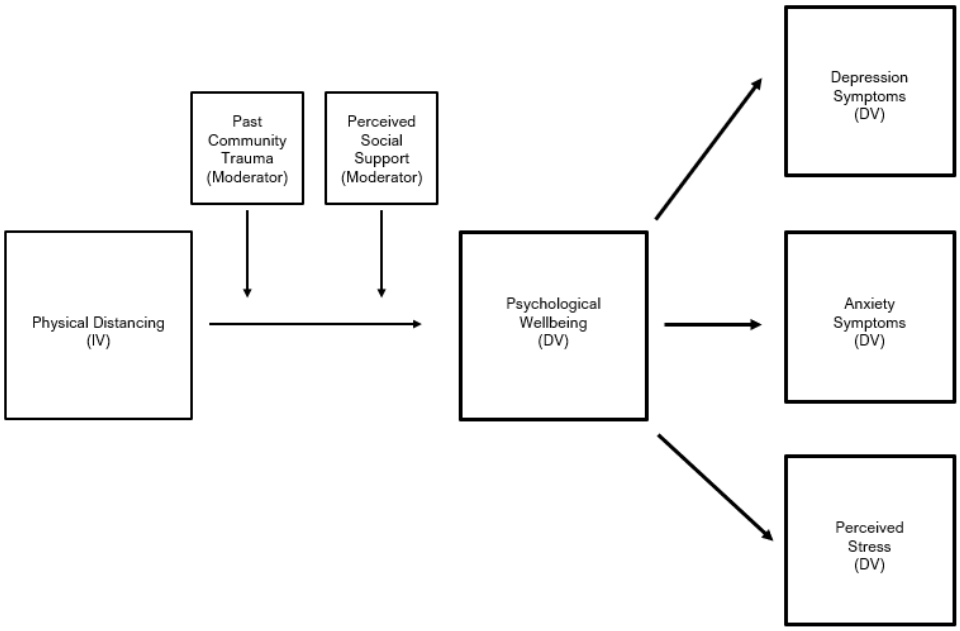

Figure 4a. Conceptual Model of Association Between Physical Distancing and Psychological Wellbeing (adapted from Lund et al, 2018; Cohen & Willis, 1985)

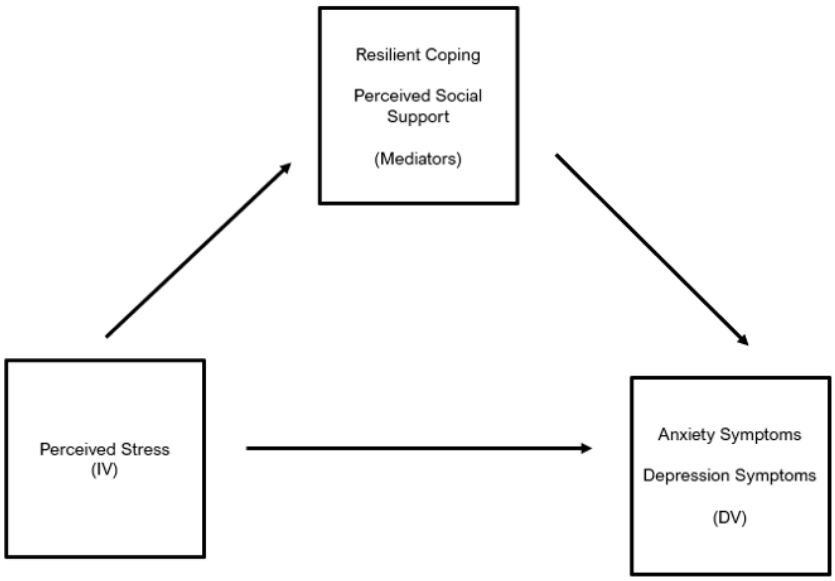

Figure 5a. Conceptual Model of Association Between Perceived Stress and Depression and Anxiety Symptoms (adapted from Lund et al, 2018; Cohen & Willis, 1985)

CHAPTER 2: SOCIODEMOGRAPHIC AND LIFESTYLE FACTORS ASSOCIATED WITH ANXIETY, DEPRESSION, AND STRESS AMONG A UNIVERSITY COMMUNITY DURING THE COVID-19 PANDEMIC

Introduction

Worldwide, an average of one disaster occurs per day [1]. Based on definitions from the World Health Organization (WHO) and the United Nations (UN), the pandemic resulting from infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the subsequent coronavirus disease 2019 (COVID-19) from the infection may be classified as a disaster [2, 3]. As an ongoing disaster, COVID-19 has affected six continents, 221 countries and territories, and has been deemed a global pandemic since March 11, 2020 [4, 5]. As data emerge, the date of the first signs of an unusual acute respiratory syndrome emerging in the Eastern Hemisphere continues to recede – now as early as December 2019 [6]. The virus and associated illness seemingly began in December 2019 in Wuhan, China and spread to more than 118,000 cases and more than 4,200 deaths in 114 countries within three months [7]. Public health efforts to reduce the spread of the virus included physical distancing, increased hand washing, and mask wearing in public [7]. In addition to the increasing number of cases and deaths, the world has been experiencing unprecedented socio-economic, political, and psycho-social impacts as a result of the pandemic [8].

In the context of past disasters, psychiatric needs have been considered less important than physical needs [9]. The WHO and World Bank Group report mental illness associated costs to be $2.5 trillion in 2010 and these costs are expected to increase to $6.0 trillion in 2030, more than the cost of any other non-communicable disease including cardiovascular disease and diabetes [10]. Recently, a considerable literature has grown around the field of mental health in the context of COVID-19. In fact, the lasting mental health impact is a growing public health

concern of researchers and practitioners worldwide as the disease itself has an uncertain trajectory with unknown spread and transmission outcomes which only adds to the increased anxiety that people have been experiencing – compounded by issues like isolation in lockdown, lack of job security and high unemployment rates, and ongoing surges in cases [8, 11]. This is especially true for those who are considered vulnerable. An estimated half of the United States population is considered vulnerable because of current social circumstances; these populations face an increased number of stressors before a disaster occurs and the impacts of the disaster compounded [12, 13].

Members of the university community are a hidden population in that this community is typically not considered vulnerable, and is not likely to be a primary group to be studied as compared to those who are health professionals, elderly, those with pre-existing chronic conditions, and young children [14]. Prior to the pandemic, at any given time, 10-20% of the student population suffered from mental health problems [15]. Now, in the midst of the pandemic, with closures and restrictions, the United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates that half of the world's students, and subsequently their instructors, have been impacted by this pandemic and the nationwide closures [16, 17].

Background & Significance

Historically, infectious diseases, including the Bubonic Plague during the mid-fourteenth century and the 1918 Influenza Pandemic, are responsible for the greatest numbers of human deaths[7, 18]. It was not until 2003, with the severe acute respiratory syndrome (SARS) outbreak in China that global susceptibility to communicable diseases was first highlighted during recent times. Over the past twenty years, the world has experienced seven major infectious disease or viral epidemics (IDoVE), about half of which have been coronaviruses [19].

An estimated half of the U.S. population is considered vulnerable because of current social circumstances [20]. University students are uniquely vulnerable as they experience the daily stressors of college life including limited financial resources and lack of sufficient living spaces and reliable transportation. This places them at greater risk for stress related conditions such as weakened immune systems, anxiety, depression, self-harm, and suicidal ideation [21]. Much of the literature that included college faculty, staff or students is international, particularly from China as this is where the virus was first detected [22-31]. These studies have generally found that a decline in mental health may be attributed to the increased distance between individuals and the people who they considered to be their social support, with anxiety disorders more common and worsening when a lack of interpersonal communication occurs [25]. In the U.S., students are struggling with scattered social networks, uncertainty, and changes in course delivery while faculty are grappling with how to teach and manage their students' concerns [32].

Currently, many modalities of delivering mental health services remain changed which may remove access to care – care which may now be limited, unavailable, or unsupported by the student, faculty, or staff members' new environment. Even more, at a time when mental health resources and access are paramount, on-campus centers and employee assistance programs (EAPs) have had to reduce the amount of care or time available per person due to the overwhelming number of people asking for help [33]. This study intends to highlight the potential mental health impact that the pandemic will have on university communities for years to come.

Psychological Impact of COVID-19

Following disasters, research in the field of disaster mental health has clearly demonstrated that emotional distress and mental health issues are likely and pervasive after a disaster by those directly and indirectly affected [1, 34-38]. Psychological impacts may broadly

present in the form of distress, anger, loneliness, boredom, grief, psychiatric conditions such as depression, posttraumatic stress disorder, or anxiety, unhealthy behaviors, or noncompliance with public health measures to mitigate the spread of disease [19, 34, 36-38]. In this study, psychological impacts refer primarily to depression, anxiety, stress, and loneliness. During this pandemic, individuals are experiencing stress, depression, irritability, insomnia, blaming, panic attacks, delirium, general fear, fear of dying or falling sick, helplessness, anxiety, confusion, anger, frustration, boredom, and stigma [1, 9, 25, 34, 35, 39-41]. During the initial COVID-19 outbreak in China, [42] found that a significant number of respondents reported the psychological impact (including anxiety, depression, and stress) as moderate to severe. The uncertainty of the future compounded by physical distancing can exacerbate these impacts and responses as it did during the SARS epidemic [43].

Risk Factors. Across the literature, a wide variety of determinants or demographic factors have been found to influence individual's vulnerability and mental health outcomes. While research on the effects of COVID-19 is still developing, some early studies have indicated that there are particular risk factors that undoubtedly contribute to an increased risk for the presence of mental health problems or symptoms during or after this current pandemic.

Risk factors include cisgender woman [19, 25, 30, 36, 37, 40, 42, 44-48]; race [11, 37, 44, 49]; older age [35, 45, 50]; younger age [30, 41, 42, 44, 48, 51, 52]; student status [30, 42, 48, 51]; marital status [30, 34, 39, 42, 48, 50-52]; existing chronic physical illness prior to the pandemic [19, 35]; existing mental health diagnosis [30, 34, 35, 39, 42, 45, 48, 52, 53]; poor self-rated health [19, 39, 41, 42, 46, 48, 52]; lower household income [37, 39, 42, 48, 52]; financial problems or hardships/loss of income from quarantine or layoffs/job loss [19, 25, 35, 37, 39, 43, 48]; experiencing loneliness [19, 30, 39, 43, 48]; uncertainty about the future [54]; isolation or

quarantine [43]; living alone [25, 47]; educational level [45, 51, 52]; and being deprived of family or loved ones visiting [25].

For those subpopulations who are at increased risk due to social vulnerabilities and sociodemographic factors, prolonged distress may begin to present with anxiety and trauma related disorders as evidenced during the SARS outbreak and H1N1 pandemic [54, 55]. The idea that individuals and communities will survive the COVID-19 pandemic without emotional distress, or any psychological impact is highly unlikely. Instead psychiatric providers are bracing for high numbers of new onset or exacerbated mental health symptomology or conditions [56]. Unfortunately, the longer the duration of the COVID-19 pandemic, the higher the likelihood of poor mental health [37]. It should be noted that the psychological impacts may likely occur even if the individual never contracts COVID-19 or experiences the related symptoms.

Gaps in Current Literature

As evidence of the psychological impact of COVID-19 accumulates around the world, public health researchers and practitioners are alerted of the need to understand which populations and subpopulations are at highest risk for long lasting effects and how such effects can be mitigated to target interventions and resources. However, gaps still exist that will influence quality, quantity, and access to care as well as who will be at greatest risk among vulnerable groups, especially as current literature supports that the risks and impacts are not evenly distributed across populations [34, 35, 37]. For instance, other studies have been primarily conducted outside the U.S. with few studies focused on university communities and even fewer that include faculty and staff. Furthermore, many evaluated the immediate aftermath or earliest stages of the pandemic rather than possible effects months or a full year later. This study not only focuses on a U.S. university community, but also includes faculty and staff – fundamental

components of a university community. Furthermore, data were collected at the end of the first year of the pandemic, weeks after Phase 3 of Stay at Home Orders began – when some of the more severe restrictions that individuals had been living with for an average of 6 months or more were still occurring.

Considering the recent, ongoing, and evolving nature of this pandemic, research on the university community has been very limited across populations. This pandemic provides a prime opportunity to further understanding of mental health needs and care of university communities. Given the established associations between sociodemographic factors and poor psychological wellbeing – anxiety symptoms, depression symptoms, and stress in the context of previous disasters, there is reason to note and examine the psychological impact of COVID-19 on university communities in the U.S. during this ongoing pandemic. This study fills the aforementioned gaps by expanding on this research. Specifically, the purpose of this study is to examine which sociodemographic factors are related to poor mental health outcomes among a university community, including not only students, but also faculty and staff. To the best of our knowledge, no studies thus far have focused on depression, anxiety, and perceived stress among an entire university community in the Southeast U.S. within the context of the ongoing COVID-19 pandemic.

Methods

Study Design & Population

The University of North Carolina at Charlotte (UNC Charlotte), a public 4-year university, is described as North Carolina's "urban research institute" (UNC Charlotte, 2020). As of Spring of 2020 when data collection commenced, almost 30,000 students were enrolled and over 1,100 faculty were employed by the university [57].

This cross-sectional study of a University population used a web-based, online questionnaire to collect information on the psychological impact of COVID-19 as evidenced by anxiety symptoms, depression symptoms, and percieved stress. To evaluate feasibility, average time for completion, and the accuracy of the instructions and questions, a pilot test was completed by a small sample of students at the university. Appropriate adjustments were made thereafter prior to sending out the final questionnaire. An email was sent in December 2020 by the university Office of Institutional Research via an anonymous link to every member of the university who was working (faculty or staff) or enrolled (student) at the university at the time of the study via their university-affiliated email. The questionnaire was sent to approxtimately 31,000 individuals.

The 129-item questionnaire took approximately 20 minutes to complete and included questions from validated scales that assessed/asked about depression symptoms, anxiety symptoms, perceived stress, loneliness, perceieved social support, and coping, and demographic data (i.e. gender, age, educational level, faculty level, marital status, self-rated physical health, and self-rated mental health). There were also questions related specifically to the university community (i.e., role at the university and program level), and the various impacts to daily life due to the COVID-19 pandemic (i.e., housing, employment, stay at home and self-isolation orders).

The study was reviewed and approved as “Exempt” by the University Institutional Review Board (IRB). Participants provided electronic informed consent. To ensure confidentiality, questionnaires had to be completed in one sitting. Participants could choose to enter their email addresses in a drawing for a chance to win a $50 gift card. Upon completion of the questionnaire, a disclaimer reminded participants that the questionnaire was not diagnostic

and risk messaging was displayed if an individual scored "clinically significant risk" based on their scores in the validated scales. All study participants received information about relevant and useful emergency/crisis resources in their area, including campus psychological services, the local County Department of Public Health, and/or who to contact in the event of a mental health emergency or crisis.

Those eligible to complete the questionnaire were individuals who were working as faulty/staff or enrolled as a student prior to the start of the Spring 2020 semester (i.e., January 8, 2020). Individuals were ineligible to complete the questionnaire if they were newly enrolled students or newly hired faculty or staff (i.e. enrolled or hired Spring 2020 or later). A total of 1,373 individuals anonymously completed the online questionnaire. Prior to analysis, we excluded 22 participants who had insufficient/inadequate responses due to the fact that they skipped the majority of questions and/or completed the questionnaire in a short period of time (less than 5 minutes). Thus, the final population sample comprised 1,351 participants.

Measures

Predictor Variables. Based on a review of literature related to disaster mental health and risk factors for poor mental health outcomes, the following variables were selected as predictor variables – gender (cisgender man, cisgender woman, genderqueer), age, living status (living alone or with others), marital status (single/never married, married/living together, divorced/widowed/separated), self-rated physical health, self-rated mental health, relocation during the pandemic, race/ethnicity, annual household income, employment status (before and during the pandemic), and role at the university (faculty, staff, student). We also assessed whether or not participants had a mental health diagnosis or symptoms prior to the pandemic. Individuals' perception of degree of coping with the impact of the pandemic on their lives

overall was measured using 5-point Likert scale response options ranging from “extremely well” to “not well at all.” Lastly, we assessed a person’s perceived loneliness with the 6-item *DeJong Gierveld Loneliness Scale.* The scale which assessed both emotional and social loneliness ranges from 0 (“least lonely”) to 6 (“most lonely”). The scale is not a diagnostic tool and therefore does not have cut-off points; however, higher scores are associated with being lonelier. Based on the sample size in this study, this variable was categorized as an ordinal variable (0-1 not/least lonely, 2-4 moderately lonely, and 5-6 most lonely).

Outcome Variables. In this study, the presence of depression, anxiety, and stress are indicators of lack of psychological wellbeing and measured as three individual outcomes variables.

To measure the indicators and the associated possible symptomology of anxiety, the General Anxiety Disorder (GAD-7), a brief self-report screening questionnaire that inquiries about the frequency of anxiety symptoms within the past two weeks, was used [58]. It consists of 7 Likert-type questions with responses ranging from 0-3. The score can range from 0-21. Based on the sample size in this study, anxiety was coded as an ordinal variable: 0-9 minimal/mild, 10-14 moderate, and ≥ 15 severe. The GAD-7 is a well validated screening tool with an excellent internal consistency (Cronbach $\alpha = 0.92$) [59, 60].

To measure the indicators and the associated possible symptomology of depression, the Patient Health Questionnaire (PHQ-9) scale, a brief self-report screening questionnaire that inquiries about the frequency of depression symptoms over the past two weeks, was used. It consists of 9 Likert-type questions with responses ranging from 0-3 (i.e., 0=not at all, 1=several days, 2=more than half the days, 3=nearly every day). The score can range from 0-27. This study did not include the 9th item, "Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?" which is a suicidal screening question since real-time monitoring and

immediate intervention based on the response to that item is not feasible [61]. Levis, Benedetti and Thombs [62] found that a cut-off score of 10 or above allowed for maximized sensitivity and specificity overall and can be used in the general population to assess for depression. Based on the sample size in this study, this variable was coded as an ordinal variable: 0-9 low/mild, 10-14 moderate, 15-19 moderately severe, and ≥ 20 severe depression. The PHQ-9 is a well validated screening tool in several languages and populations with a good internal consistency (Cronbach $\alpha = 0.88$); however, it is subject to inherent biases such as social desirability due to self-reporting [63].

To measure the indicators and symptoms of perceived stress, the Perceived Stress Scale-10 (PSS-10) was used. The 10-item scale is one of the most widely used psychological instruments that measures the degree to which one perceives their life circumstances or recent situation to be stressful. Specifically, it examines how "unpredictable, uncontrollable, and overloaded" individuals find their lives (Cohen et al., 1994). The questions asked about perceived stress and feelings in the past month with response options asking about frequency of feelings. An individual score on the PSS can range from 0 to 40. The scores have been found to be significantly correlated as expected with scores compared to GAD-7 and PHQ-9 [29]. The scale is not a diagnostic tool and therefore does not have cut-off points; however, higher scores are associated with higher perceived stress [64]. Based on the sample size in this study, this variable was coded as a binary variable: 0-20 low/moderate stress and 21-40 high perceived stress. The PSS-10 has good internal consistency (Cronbach = 0.70) [65]. Overall, the PSS-10 has "superior psychometric properties" compared to the 14-item and 4-item versions of the scale and has been primarily empirically evaluated in college students or workers [65].

These tools have been used during recent COVID-19 related studies in the general population [66-69] as well as in students [27].

Statistical Analysis. Summary statistics of the sociodemographic characteristics of participants and outcomes were calculated. Specifically, frequencies and percentages were obtained. Logistic regression was used to obtain odds ratios and 95% confidence intervals to provide an unadjusted measure of the association between each of the sociodemographic factors and each of the outcomes. Prior to forming the final multivariate models, we ran various collinearity diagnostics but did not find any evidence of collinearity among predictor variables. Multivariate logistic regression models were then created by including all the potential predictors in each model and then using a backwards elimination procedure to retain only predictor variables with $p < 0.20$[70]. All analytical procedures were conducted using SAS statistical software package, version 9.4.

Results

Demographic Characteristics of Study Population

The majority of the sample were students (71.6%), cisgender woman (70.98%), Non-Hispanic White (60.0%), single/never married (56.6%), and less than 25 years of age (50.2%; Table 1). Over one half of participants self-rated their physical health before the pandemic as excellent/very good (53.3%) while only one third of participants self-rated their physical health as “excellent/very good” during the pandemic (29.7%). Comparatively, nearly 45% of participants self-rated their mental health as “excellent/very good” before the pandemic (44.3%), but only 16.2% described their mental health as “excellent/very good” during the pandemic. With respect to preparedness, almost 56% of participants did not feel they were prepared to cope with the impact COVID-19 had on their lives. Among all participants, the primary concern or

fear was related to mental health (24.6%), followed by employment (19.5%) and finances (17.4%).

Anxiety Symptoms Outcome

Unadjusted Findings

Gender, age, self-rated physical and mental health, experiencing mental health symptoms prior to the pandemic, the perception of the degree of coping, perceived loneliness, having to relocate, and role at the university were all associated with statistically significant increased odds of reporting severe anxiety symptoms (Table 2). Specifically, individuals who self-rated their physical or mental health as "fair/poor" before the pandemic had statistically significant increased odds of reporting severe anxiety symptoms (physical: OR = 2.52, 95% CI: 1.78, 3.28; mental: OR = 6.65, 95% CI: 5.02, 8.81) as compared to those who self-rated their physical or mental health as "excellent/very good." During the pandemic, these associations increased in magnitude (physical health "fair/poor": OR = 4.21, 95% CI: 3.15, 5.63; mental health "fair/poor": OR = 53.43, 95% CI: 21.77, 131.14). There was no association found between living alone during the pandemic and severe anxiety (OR = 0.91, 95% CI: 0.56, 1.48); however, there was an association between having to relocate and severe anxiety (OR = 1.94; 95% CI: 1.51, 2.49).

Adjusted Findings

Self-rated physical health before the pandemic, income, race/ethnicity, and role at university were excluded from the model and all other factors were retained as independent variables associated with severe anxiety. Associations were attenuated between reported age, marital status, self-rated physical health before the pandemic, and self-rated mental health before and during the pandemic and severe anxiety (Table 3). Those who self-rated their mental health

as “fair/poor” during the pandemic had nearly a nine-fold increased odds of reporting severe anxiety (OR: 8.70, 95% CI: 3.24, 23.36) than those who self-rated it as “excellent/very good.” Other than the self-rated mental health during the pandemic, the perception of the degree of coping with impact of pandemic and perceived loneliness were the strongest predictors of reporting severe anxiety symptoms. Compared to those who perceived they were coping with the impact of the pandemic “excellent/very well,” those who perceived their coping as “slightly well/not well at all” had nearly seven times the odds of reporting severe anxiety (OR=6.82, 95% CI: 4.16, 11.19). Those who perceived themselves to be the loneliest has 5.45 times the odds of reporting severe anxiety when compared to those who perceived themselves to be the least lonely or not lonely at all (95% CI: 3.12, 9.52).

Depression Symptoms Outcome

Unadjusted Findings

Gender, age, marital status and race were associated with statistically significant increased odds of reporting severe depression symptoms (Table 2). Similar to the findings for the anxiety symptoms outcome, individuals who self-rated their physical or mental health as “fair/poor” before and during the pandemic had statistically significant increased odds of reporting severe depressive symptoms as compared to those who self-rated their health as “excellent/very good” (Table 2). Compared to those who perceived they were coping with the impact of the pandemic “excellent/very well,” those who perceived their coping as “slightly well/not well at all” had nearly 30 times the odds of reporting severe depression (OR=27.91, 95% CI: 18.73, 41.60). Similarly, those who perceived themselves to be the loneliest had 16.22 times the odds of reporting severe depression when compared to those who perceived themselves to be the least lonely or not lonely at all (95% CI: 10.28, 25.60).

Adjusted Findings

Self-rated physical health before the pandemic and role at university were excluded from the model and all other factors were retained as independent variables associated with severe depression. The association between reported gender, age, self-rated physical health during the pandemic, self-rated mental health before and during the pandemic and severe depression were attenuated (Table 3). Those who reported their perception of their personal degree of coping with the impact of the pandemic as "slightly well/not well at all" had over six times increased odds of reporting severe depression symptoms when compared to those who reported coping "extremely well/very well" (OR: 6.41, 95% CI: 3.96, 10.36) while those who scored as "most lonely" on the PSS-10 had over four times increased odds of reporting severe depression symptoms (OR: 4.39, 95% CI: 2.57, 7.50).

Perceived Stress Outcomes

Unadjusted Findings

Gender, age, marital status, self-rated physical before the pandemic, self-rated mental health, experiencing mental health symptoms prior to the pandemic, the perception of the degree of coping, perceived loneliness, and having to relocate were all associated with statistically significant increased odds of perceiving high stress (Table 2). Unlike the depressive and anxiety symptoms outcomes, there was no association between self-rating physical health as "good" before and during the pandemic and high perceived stress (Table 2). However, those who self-rated their mental health as "fair/poor" had 6.61 times the odds of perceiving high stress (95% CI: 4.77, 9.14). Those who perceived their degree of coping to be "slightly well/not well at all" had almost eight times the odds of perceiving high stress as compared to those who reported their perception to be "extremely well/very well" (OR=7.70, 95% CI: 5.38, 11.03).

Adjusted Findings

Marital status, self-rated physical health before the pandemic, living status before the pandemic, and income were excluded from the model and all other factors were retained as independent variables associated with high perceived stress. The association between reported gender, age, self-rated physical health before the pandemic, self-rated mental health before and during the pandemic and high perceived stress were attenuated and most were no longer statistically significant (Table 3). Those who self-rated their physical and mental health as "good" before the pandemic had statistically significant decreased odds of high perceived stress when compared to those who rated their physical and mental health as "excellent/very good" before the pandemic (OR: 0.72, 95% CI: 0.54, 0.98 and OR: 0.68, 95% CI: 0.49, 0.94, respectively).

Discussion

In this university population, gender, age, self-rated mental health, prior mental health diagnosis/symptoms, perceived degree of coping, and loneliness were associated with statistically significant increased odds of poor mental health outcomes (severe depression, severe anxiety, higher perceived stress). Prior literature has noted the association between particular sociodemographic factors – such as gender, age, living status, marital status, self-rated mental health, and self-rated physical health – and poor mental health outcomes and psychological wellbeing [1, 19, 25, 30, 35, 42, 45, 46, 55, 71-78].

Findings between the predictor variables and severe anxiety were consistent with prior research that examined anxiety as a primary outcome [1, 55, 73-76, 78]. After adjustment, the majority of the associations between sociodemographic factors and severe depression were attenuated; yet, several remained at statistical significance such as gender, age, "poor/fair" self-rated mental

health, and self-rated physical health during the pandemic. Consistent with earlier studies pertaining to disaster mental health, the majority of this university population had none or mild symptoms of anxiety or depression before COVID-19? [1, 25]; however, the majority of the sample perceived higher stress during this time. This inconsistency may be because previous studies considered the general population or included specific populations such as first responders or medical students [1, 42, 71, 76, 78] while the current study considered a university population. Furthermore, several studies were conducted in international populations, such as Italy, China, and Spain, where perceptions of stress may differ [30, 39, 42, 45, 46, 52, 73, 75, 76, 78-80].

Previous studies have found that those with lower self-rated mental or physical health had lower psychological wellbeing [1, 35, 42, 46, 77, 81]. However, in this study, "fair/poor" self-rated physical health and "good" self-rated mental health before the pandemic were protective factors against higher perceived stress. This may be due to increased motivation to use quarantine time to improve their health via engaging in physical activity, committing to healthier habits, seeking online? therapy, practicing coping skills or increasing their social support seeking [55]. Additionally, in the state of North Carolina, immunocompromised or at high risk were able to receive the vaccine earlier and this may have alleviated some stress [82].

After adjustment, being single/never married had a negative association with both severe depression and anxiety. These findings are inconsistent with other research that found being single or unmarried placed one at increased risk for poor mental health [1, 74, 75]. This departure may be due to unmeasured variables such as the quality of marriage/relationship, the dynamics and expectations of the relationship, and the amount of time spent in the home before and during the pandemic. It is important to note that studies published prior to 2020 were examining other disasters, not including pandemics. Moreover, living alone and/or being single may have reduced

the likelihood of interacting with others or having children no longer in school during the pandemic [55, 83, 84].

It should be noted that both the perception of the degree of coping with the impact of COVID-19 and perceived loneliness had the strongest associations with poor psychological wellbeing after adjustment. These results corroborate the findings of a great deal of the previous work in which loneliness [8, 18, 35, 43, 56, 85] was found to be a primary reason for a decline in mental health; and coping was deemed a protective factor in buffering the negative effects of stress, including poor psychological wellbeing [19, 43, 62, 86].

Strengths & Limitations

Due the cross-sectional nature of this study, temporal bias is a concern. However, to mitigate these concerns, we collected information on previous mental health symptoms and diagnoses and worded questions to ask about experiences and health prior to COVID and during the pandemic. Additionally, non-differential misclassification is possible as all of the variables in this study are self-reported. However, validated scales were used to measure anxiety symptoms, depression symptoms, perceived stress, and loneliness which helps to limit some of these concerns.

Selection bias is also possible, as there was a low participation rate; this is in line with previous studies conducted with university populations [87]. Since the pandemic, recent research has suggested that response rates for online questionnaires have gotten lower because people are experiencing “questionnaire fatigue” and many forms of "safe" and physically distanced communication takes place via technology. This increased screen time may cause people to be on their computers and phones even more so than usual and people may want to get off of or take longer breaks from their devices [88, 89]. Moreover, we compared demographic characteristics of

our population to the overall UNC Charlotte population and found they were similar with respect to race/ethnicity and age. However, the sample did differ significantly with respect to gender with a higher percentage of cisgender women responding to the questionnaire. However, this is supported by previous research that found a women are more likely to respond to the online questionnaires than men [90]. Due to a small number of cisgender men respondents, stratification by gender was not conducted. Additionally, bias may occur because of the increased likelihood of individuals responding in a socially acceptable or expected way given the sensitive nature of the exposure variable and the pervasive stigma associated with mental illness. However, the confidential and anonymous nature of this survey could reduce these concerns.

This study also has several strengths. One main strength of the study is the large sample size (n = 1,351) which is comparable to other COVID-19 studies [37, 42, 47, 52, 73, 79]. Additionally, this study sampled a unique vulnerable population that is often not at the forefront of disaster research studies. These findings may be generalizable to other university populations in the U.S, particularly those in urban locations. It also provides valuable information about the current pandemic including which subpopulations within a university may be at higher risk for poor mental health outcomes and validates the need to consider perceptions of the current psychological impact. Particularly, it adds to the literature by examining anxiety and not just posttraumatic stress disorder or depression – the two most commonly studied mental health outcomes in post disaster research [1]. This study also highlights need for interventions aimed to reduce poor mental health outcomes given necessary public health interventions such as physical distancing.

Conclusion

Given the uniqueness of this uncertain time and its threat to mental health, this study may help to prepare universities to recognize that in the current climate and immediate aftermath, mental and behavioral illnesses will increase in prevalence and affect students, faculty, and staff. At the time of the study and even today, traditional methods of coping or seeking help, such as school counseling centers, are no longer offering care in person. This removes or limits access of care which may now be limited, unavailable, or unsupported by the individual's new environment. The study may be used to inform university community interventions based on specific real and anticipated needs of this unique population such as multidisciplinary programs specific to mental health and internet-based interventions available during and post pandemic [91, 92]. This is especially needed as university communities are trying to help themselves where there may be strain already due to past trauma, increased need of mental health services, limited resources, and funding. The field of public health needs to rapidly respond to the public mental health need that has risen because of COVID-19. This study assists in understanding the sociodemographic makeup of this university community to determine who is most vulnerable to increased odds of experiencing poor mental health outcomes such as anxiety, depression, and perceived stress. Future studies of this topic might consider the impact of physical distancing or perceptions of coping on mental health outcomes in this population as well as apply a longitudinal approach to evaluate the long-term psychological impact.

Table 1a: Sociodemographics of University Community in Psychological Impact Analysis (n=1,351); Study on Psychological Impact of COVID-19 on University Community, 2020-2021

Sociodemographic	N (%)
Gender[1]	
Cisgender Man	358 (26.64)
Cisgender Woman	954 (70.98)
Genderqueer	32 (2.36)
Race	
White	811 (60.03)
Black	153 (11.32)
Other[2]	83 (6.14)
Asian	157 (11.62)
Hispanic/Latinx	119 (8.81)
Missing[3]	28 (2.07)
Age	
18-24	678 (50.19)
25-34	201 (14.88)
35-54	174 (12.88)
55-72	258 (19.10)
Unknown/Missing	40 (2.96)
Marital Status[4]	
Single/Never Married	764 (56.59)
Married/ Living Together/Partner	529 (39.19)
Divorced/Separated/Widowed	57 (4.22)
Employment Status Before Pandemic	
Employed[5]	966 (73.72)
Unemployed[6]	355 (26.28)
Employment Status During Pandemic[7]	
Employed[5]	934 (69.24)
Unemployed[6]	415 (30.76)
Annual Household Income	
$0- 24,999	370 (27.39)
$25,000-49,999	202 (14.95)
$50,000-74,999	201 (14.88)
$75,000-99,999	156 (11.55)
$100,000+	305 (22.58)
Prefer not to Answer	117 (8.66)
Role at University	
Student	967 (71.58)
Faculty or Staff	384 (24.82)
Living Status Before Pandemic	
Alone	129 (9.55)
With Others (with partner/spouse, friend/roommate, family)	1067 (78.98)
Unknown/Missing	155 (11.47)
Living Status After Pandemic	
Alone	123 (9.10)
With Others (with partner/spouse, friend/roommate, family)	1100 (81.42)
Unknown/Missing	128 (9.47)
Relocated During the Pandemic outside of Charlotte, NC[8]	
Yes	289 (21.52)
No	1054 (78.48)
Mental Health Diagnoses/Symptoms Before	
Yes	415 (30.72)

[1] Number of Missing Participants: 7
[2] Bi/Multi-racial· American Indian/Alaska Native, NHOPI, Other
[3] Prefer not to Answer, Unknown/Missing
[4] Number of Missing Participants: 1
[5] Full-time or Part-time
[6] Student, Retired, Disabled
[7] Number of Missing Participants: 2
[8] Number of Missing Participants: 8

No	851 (65.51)
Prefer Not to Answer	51 (3.77)
Would Get Vaccine When Available	
Yes	811 (60.03)
No	165 (12.21)
Undecided	375 (27.76)
Self-rated Physical Health Before Pandemic[9]	
Excellent/Very Good	718 (53.26)
Good	436 (32.34)
Fair/Poor	194 (14.39)
Self-rated Physical Health During Pandemic[10]	
Excellent/Very Good	400 (29.74)
Good	445 (33.09)
Fair/Poor	500 (37.17)
Self-rated Mental Health Before Pandemic	
Excellent/Very Good	597 (44.29)
Good	414 (30.71)
Fair/Poor	337 (25.00)
Do Not Know/Unsure	3
Self-rated Mental Health During Pandemic[11]	
Excellent/Very Good	218 (16.22)
Good	318 (23.66)
Fair/Poor	808 (60.12)
Engaged in Physical Distancing	
Yes	1234 (91.34)
No	117 (8.66)
Believes that Physical Distancing in Beneficial to Self	
Yes	1246 (92.23)
No	59 (4.37)
Missing	46 (3.40)
Believes that Physical Distancing in Beneficial to Others	
Yes	1262 (93.41)
No	50 (3.70)
Missing	39 (2.89)
Biggest Concern or Fear During Pandemic	
Household Concerns [12]	28 (2.08)
Employment	150 (11.14)
Finances	263 (19.52)
Family[13]	234 (17.37)
Physical Health	188 (13.96)
Mental Health	331 (24.57)
Academics/School	153 (11.36)
Perception of Degree of Coping[14]	
Extremely Well/Very Well	394 (29.21)
Moderately Well/Slightly Well	621 (46.03)
Not at All	334 (24.76)
Prepared to Cope with COVID-19 Impact	
Yes	417 (30.87)
No	751 (55.59)
Missing	183 (13.55)

[9] Number of Missing Participants: 3
[10] Number of Missing Participants: 6
[11] Number of Missing Participants: 7
[12] Housing & Groceries/Food
[13] Adult Care, Child Care, Family Wellbeing
[14] Number of Missing Participants: 2

Table 2a. Unadjusted ORs and 95% CIs for the Association between Sociodemographic Factors and Severe Depression Symptoms, Severe Anxiety Symptoms, and High Perceived Stress; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Anxiety Symptoms		Severe Depression Symptoms		High Perceived Stress	
Sociodemographic Factor	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Gender						
Cisgender man	1.00	Referent	1.00	Referent	1.00	Referent
Cisgender woman	2.15*	1.64 – 2.82	2.71*	2.08 – 3.59	2.33*	1.81 – 2.98
Genderqueer	7.65*	3.91 – 14.93	5.53*	2.78 – 11.01	7.32*	2.52 – 21.25
Age						
18 – 24	4.21*	2.97 – 5.98	4.63*	3.24 – 6.62	2.20*	1.64 – 2.95
25 – 34	2.84*	1.86 – 4.34	3.01*	1.96 – 4.62	2.03*	1.38 – 2.98
35 – 54	1.38	0.86 – 2.22	1.50	0.93 – 2.43	0.90	0.62 – 1.33
55 – 72	1.00	Referent	1.00	Referent	1.00	Referent
Missing	3.44	1.74 – 6.78	4.07*	2.06 – 8.05	3.19*	1.46 – 6.96
Marital Status						
Single/Never Married	1.72*	1.36 – 2.16	1.65*	1.31 – 2.07	1.46*	1.16 -1.84*
Married/Living Together/Partner	1.00	Referent	1.00	Referent	1.00	Referent
Divorced/Widowed/Separated	0.71	0.38 – 1.34	0.52	0.26 – 1.02	0.95	0.55 – 1.65
Self-Rated Physical Health Before Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	1.75*	1.38 – 2.23	1.34*	1.05 – 1.71	1.02	0.79 – 1.30
Fair/Poor	2.70*	1.99 – 3.67	2.52*	1.78 – 3.28	1.75*	1.22 – 2.49
Self-Rated Physical Health During Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	1.99*	1.45 – 2.74	1.89*	1.39 – 2.57	1.29	0.98 -1.69
Fair/Poor	5.66*	4.19 – 7.64	4.21*	3.15 – 5.63	2.28	1.72 – 3.02
Self-Rated Mental Health Before Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	2.31*	1.75 – 3.04	2.10*	1.50 – 2.77	1.30*	1.01 – 1.68
Fair/Poor	6.47*	4.89 – 8.57	6.65**	5.02 – 8.81	3.52*	2.56 – 4.84
Self-Rated Mental Health During Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	2.11	1.07 – 4.17	7.44*	2.91 – 19.03	1.91*	1.37 – 2.72
Fair/Poor	21.86**	12.00 – 39.84	53.43*	21.77 – 131.14	6.61*	4.77 – 9.14
Living Status Before Pandemic						
Alone	0.82	0.56 – 1.21	1.32	0.89 – 1.94	1.00	0.68 – 1.46
With Others	1.00	Referent	1.00	Referent	1.00	Referent
Unknown	1.52*	1.10 – 2.11	2.11*	1.31 – 3.40	1.20	0.84 -1.72
Living Status During Pandemic						
Alone	0.85	0.53 – 1.25	1.24	0.84 – 1.83	0.98	0.67 – 1.44
With Others	1.00	Referent	1.00	Referent	1.00	Referent
Unknown	1.11	0.77 – 1.60	1.56	0.95 – 2.58	1.12	0.76 – 1.65
Experienced Mental Health Symptoms/Diagnosis Before Pandemic						
Yes	3.37*	2.67 – 4.25	3.98*	3.14 – 5.03	3.59*	2.70-4.76
No	1.00	Referent	1.00	Referent	1.00	Referent
Prefer Not to Answer	2.56*	1.49 – 4.37	2.51*	1.46 – 4.33	1.33	0.74- 2.39
Perception of Degree of Coping with Impact of Pandemic						
Extremely Well/Very Well	1.00	Referent	1.00	Referent	1.00	Referent

Moderately Well	5.00*	3.44 – 7.25	6.70*	4.51 – 9.53	2.84*	2.19 – 3.68
Slightly Well/Not Well at All	27.91*	18.73 – 41.60	28.84*	18.95 – 43.92	7.70*	5.38 – 11.03
Perceived Loneliness						
Not/Least Lonely	1.00	Referent	1.00	Referent	1.00	Referent
Moderately Lonely	4.72*	3.00 – 7.44	5.92*	3.67 – 9.54	1.94*	1.45 – 2.60
Most Lonely	16.22*	10.28 – 25.60	17.44*	10.78 – 28.20	3.71*	2.69 – 5.11
Income						
$0 – 24,999	1.00	Referent	1.00	Referent	1.00	Referent
$25,000 – 49,999	0.80	0.58 – 1.12	0.81	0.58 – 1.31	0.73	0.51 – 1.04
$50,000 – 74,999	0.47*	0.33 – 0.67	0.64*	0.45 – 0.90	0.69*	0.48 – 0.99
$75,000 – 99,999	0.45*	0.30 – 0.66	0.52*	0.35 – 0.77	0.71	0.48 – 1.04
$100,000 ≤	0.47*	0.34 – 0.64	0.53*	0.39 – 0.73	0.61*	0.44 – 0.84
Prefer Not to Answer	0.79	0.53 – 1.18	0.86	0.58 – 1.29	0.93	0.60 – 1.45
Race/Ethnicity						
Non-Hispanic White	1.00	Referent	1.00	Referent	1.00	Referent
Non-Hispanic Black	0.82	0.57– 2.53	0.80	0.56 – 1.15	0.71	0.50 – 1.00
Other (AIAN, Asian, NHOPI, Bi/Multiracial)	1.65*	1.07 – 2.53	0.99	0.63 – 1.56	1.32	0.80 – 2.19
Asian	1.01	0.72 – 1.43	0.86	0.61 – 1.22	0.72	0.51 – 1.02
Prefer Not to Answer	1.29	0.88 – 1.88	1.08	0.73 – 1.58	0.84	0.56 – 1.24
Hispanic/Latinx	1.74	0.86 – 3.54	1.27	0.61 – 2.63	0.44*	0.21 – 0.94
Relocated During the Pandemic						
Yes	1.94*	1.51 – 2.49	2.26*	1.76 – 2.90	1.60*	1.21 – 2.14
No	1.00	Referent	1.00	Referent	1.00	Referent
Role at University						
Student	2.95*	2.24 – 3.88	2.84*	2.17 -3.74	1.97*	1.55 – 2.52
Faculty & Staff	1.00	Referent	1.00	Referent	1.00	Referent
Employment Status Before Pandemic						
Employed	1.00	Referent	1.00	Referent	1.00	Referent
Unemployed	1.33*	1.05 – 1.69	1.23	0.97 – 1.57	0.88	0.69 – 1.13
Employment Status During Pandemic						
Employed	1.00	Referent	1.00	Referent	1.00	Referent
Unemployed	1.51*	1.20 – 1.89	1.25	1.00 – 1.58	1.03	0.81 – 1.32

Table 3a. Adjusted ORs and 95% CIs for the Association between Sociodemographic Factors and Severe Depression Symptoms, Severe Anxiety Symptoms, and High Perceived Stress; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Anxiety Symptoms[†]		Severe Depression Symptoms[‡]		High Perceived Stress[ᵔ]	
Sociodemographic Factor	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Gender						
Cisgender man	1.00	Referent	1.00	Referent	1.00	Referent
Cisgender woman	1.84*	1.32 – 2.57	1.43*	1.03 – 1.97	1.66*	1.25 – 2.22
Genderqueer	1.40	0.64 – 3.06	2.76*	1.32 – 5.76	2.55	0.82 – 7.93
Age						
18 – 24	2.54*	1.53 – 4.21	2.00*	1.91 – 3.34	1.14	0.72 – 1.81
25 – 34	1.94*	1.15 – 3.26	1.49	0.87 – 2.54	1.28	0.79 – 2.08
35 – 54	0.75	0.42 – 1.34	0.74	0.42 – 1.31	0.59*	0.38 – 0.93
55 – 72	1.00	Referent	1.00	Referent	1.00	Referent
Missing	3.80*	1.64 – 8.83	1.73	0.75 – 4.00	3.06*	1.26 – 7.45
Marital Status						
Single/Never Married	0.58*	0.41 – 0.80	0.71*	0.52 – 0.99	-	-
Married/Living Together/Partner	1.00	Referent	1.00	Referent	-	-
Divorced/Widowed/Separated	0.44	0.18 – 1.09	0.73	0.31 – 1.73	-	-
Self-Rated Physical Health Before Pandemic						
Excellent/Very Good	1.00	Referent	-	-	1.00	Referent
Good	0.75	0.55 – 1.02	-	-	0.72*	0.54 – 0.98
Fair/Poor	1.02	0.70 – 1.48	-	-	0.96	0.62 – 1.48
Self-Rated Physical Health During Pandemic						
Excellent/Very Good	-	-	1.00	Referent	-	-
Good	-	-	1.08	0.75 – 1.57	-	-
Fair/Poor	-	-	1.68*	1.18 – 2.40	-	-
Self-Rated Mental Health Before Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	0.94	0.67 – 1.31	1.04	0.75 – 1.44	0.68*	0.49 – 0.94
Fair/Poor	1.71*	1.19 – 2.46	1.52*	1.07 – 2.14	1.17	0.77 – 1.79
Self-Rated Mental Health During Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	3.71*	1.35 – 10.15	0.83	0.39 – 1.75	1.39	0.92 – 2.11
Fair/Poor	8.70*	3.24 – 23.36	3.06*	1.50 – 6.22	2.50*	1.58 – 3.95
Living Status Before Pandemic						
Alone	0.91	0.56 – 1.48	0.98	0.61 – 1.57	-	-
With Others	1.00	Referent	1.00	Referent	-	-
Unknown	1.36	0.92 – 2.01	1.51*	1.03 – 2.22	-	-
Experienced Mental Health Symptoms/Diagnosis Before Pandemic						
Yes	2.41*	1.81 – 3.20	1.95*	1.46 – 2.61	2.13*	1.53 – 2.98
No	1.00	Referent	1.00	Referent	1.00	Referent
Prefer Not to Answer	1.43	0.77 – 2.66	1.57	0.84 – 2.93	0.85	0.43 – 1.65
Perception of Degree of Coping with Impact of Pandemic						
Extremely Well/Very Well	1.00	Referent	1.00	Referent	1.00	Referent
Moderately Well	2.31*	1.47 – 3.68	1.81*	1.16 – 2.83	1.63*	1.17 – 2.26
Slightly Well/Not Well at All	6.82*	4.16 – 11.19	6.41*	3.96 – 10.36	3.11*	1.98 – 4.89
Perceived Loneliness						
Not/Least Lonely	1.00	Referent	1.00	Referent	1.00	Referent
Moderately Lonely	2.90*	1.68 – 5.02	1.97*	1.17 – 3.32	1.18	0.89 – 1.66
Most Lonely	5.45*	3.12 – 9.52	4.39*	2.57 – 7.50	1.48	0.99 – 2.23

Income						
$0 – 24,999	-	-	1.00	Referent	-	-
$25,000 – 49,999	-	-	1.32	0.89 – 1.96	-	-
$50,000 – 74,999	-	-	0.74	0.48 – 1.13	-	-
$75,000 – 99,999	-	-	0.82	0.51 – 1.33	-	-
$100,000 ≤	-	-	0.93	0.63 – 1.37	-	-
Prefer Not to Answer	-	-	0.68	0.42 – 1.09	-	-
Race/Ethnicity						
Non-Hispanic White	-	-	1.00	Referent	1.00	Referent
Non-Hispanic Black	-	-	0.76	0.49 – 1.20	0.65*	0.43 – 0.99
Other (AIAN, Asian, NHOPI, Bi/Multiracial)	-	-	1.55	0.95 – 2.54	1.21	0.68 – 2.13
Asian	-	-	1.38	0.90 – 2.11	0.78	0.51 – 1.19
Prefer Not to Answer	-	-	1.35	0.86 – 2.21	0.68	0.43 – 1.08
Hispanic/Latinx	-	-	3.25*	1.32 – 8.00	0.35*	0.14 – 0.89
Role						
Student	-	-	-	-	1.40	0.94 – 2.08
Faculty & Staff	-	-	-	-	1.00	Referent

Abbreviations: CI, Confidence Interval; OR, Odds Ratio.

† Adjusted for gender, age, marital status, self-rated physical health before pandemic, self-rated mental health before and during pandemic, living status before pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and perception of degree of ability to cope with impact of pandemic.

‡ Adjusted for gender, age, marital status, self-rated physical health during pandemic, self=-rated mental health before and during pandemic, living status before pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, income, and race.

∞ Adjusted for gender, age, self-rated physical health before pandemic, self-rated mental health before and during pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, ethnicity, perception of degree of ability to cope with impact of pandemic, role at the university, and employment status before the pandemic.

*p-value: ≤0.05

- A dash (-) denotes these variables were not included in the final model for the outcome (see methods).

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CHAPTER 3: THE ASSOCIATION BETWEEN PHYSICAL DISTANCING AND POOR MENTAL HEALTH OUTCOMES: A STUDY ON AN UNIVERSITY FACULTY, STAFF, AND STUDENTS DURING THE COVID-19 PANDEMIC

Introduction

Over the past two years, the COVID-19 pandemic – caused by the coronavirus SARS-CoV-2 which originated in December 2019 in Wuhan, China – has spread to more than 425.6 million cases and led to more than 5.9 million deaths in 224 countries[1]. In the United States (U.S.) alone, there have been 79,078,932 cases and 955,135 deaths to date and the number continues to rise [2]. In addition to the increasing number of cases and deaths, the world continues to experience unprecedented socio-economic, political, and psycho-social impacts as a result of the ongoing pandemic[3]. Until December 2020, when the COVID-19 vaccine became available to the general public, public health efforts to reduce the spread of the virus included physical distancing, increased hand washing, and mask wearing in public[1]. The greatest concern of public mental health researchers now is the increased risk for anxiety and depression, particularly as public health measures in past epidemics, such as in 2003 SARS and 2009 H1N1[4] outbreaks, negatively impacted mental health in the general population.

In the context of past disasters, psychiatric needs have been considered less important than physical needs [5]. The WHO and World Bank Group report mental illness associated costs to be $2.5 trillion in 2010 and these costs are expected to increase to $6.0 trillion in 2030, more than the cost of any other non-communicable disease including cardiovascular disease and diabetes [6]. Recently, a considerable literature has grown around the field of mental health in the context of COVID-19. In fact, the lasting mental health impact is a growing public health concern of researchers and practitioners worldwide as the disease itself has an uncertain trajectory with unknown spread and transmission outcomes which only adds to the increased anxiety that people have been experiencing – compounded by issues like isolation in lockdown,

lack of job security and high unemployment rates, and ongoing surges in cases [3, 7]. This is especially true for those who are considered vulnerable. These populations face an increased number of stressors before a disaster occurs and the impacts of the disaster are compounded after [8, 9].

In the U.S. alone, an estimated one in five adults experience mental illness annually – with 21 million adults diagnosed with depression, 28 million diagnosed with anxiety disorders, and 9 million diagnosed with stress disorders[10]. During the pandemic, depression rates increased from 27.8% at the beginning of the pandemic to 32.8% in 2021[11]. Previous literature has shown that social isolation can increase psychiatric symptoms[12] as physical distancing and isolation can take away from the ability to provide or receive social support and to cope with difficult daily experiences. Yet, for the majority of this pandemic, public health officials have encouraged physical distancing (often called social isolation or social distancing) to stop the spread of the virus. However, such distancing can increase the risk of experiencing situations such as isolation, financial distress, and feeling uncertain which are all linked to poor mental health such as depression, anxiety, and stress disorders [13].

An estimated half of the U.S. population is considered vulnerable because of current social circumstances [14]. University students are uniquely vulnerable as they experience the daily stressors of college life including limited financial resources and lack of sufficient living spaces and reliable transportation. This places them at greater risk for stress related conditions such as weakened immune systems, anxiety, depression, self-harm, and suicidal ideation [15]. Much of the COVID-19 related literature that included college faculty, staff or students is international, particularly from China as this is where the virus was first detected [16-25]. These studies have generally found that a decline in mental health may be attributed to the increased distance

between individuals and the people who they consider to be their social support, with anxiety disorders more common and worsening when a lack of interpersonal communication occurs [19]. In the U.S., students are struggling with scattered social networks, uncertainty, and changes in course delivery while faculty are grappling with how to teach and manage their students' concerns [26]. Research has shown that we do not need to be physically close to experience the benefits of social support. Rather, perceived social support is a stronger indicator of positive mental health outcomes. The feeling or perception of being cared for or connected mediates the long-term effects on stress experiences[27-29].

Based on the literature, there are two primary risk factors for mental health disorders or symptomology during the post-disaster time frame – life stressors, such as financial strain, job loss, relationship stress, physical health conditions, and displace, and social support, especially perceived social support[30]. When an individual's social networks and support are disrupted, reduced in size or quality, or eliminated, there is an increased risk in experiencing a range of mental health disorders[31, 32].

Individuals have been asked to be physically distant not socially or emotionally distant. The term social distancing originates from social epidemiology and means "stay far enough away" from others to limit virus(es) spreading[33]. Recently language has changed to "Stay Together, Apart" or "Stay Apart, Stay Connected" to encourage people to socialize at a distance. The WHO was one of the first public health organizations to officially change its language to "physical distancing" in late March 2020[33]. It is in these times that social interaction and social support are paramount, and perhaps even more necessary.

Background & Literature

COVID-19 has negatively affected the mental health of many while also creating barriers to access to mental health services. While not everyone will experience clinical symptomology, the majority of people will worry or experience stress related to any number of aspects of the disease. The greatest concern of public mental health researchers is the increased risk for anxiety and depression. Evidence shows that social isolation can increase psychiatric symptoms[12]. However, public health departments and individuals alike have turned to physical distancing, as an important strategy to stop the spread of a novel virus, because, at this time physical distance from potential exposure is a known approach to successfully slow the spread. At the time of the study, the CDC recommended for individuals to stay away from social meetings and keep 6 feet, or 2 meters, from other people[34].

From a public health perspective, there is a strong justification for physical distancing to mitigate the spread[13]. At the time of the study, physical distancing was the only means despite the social and economic disruptions it caused billions of individuals across the globe including placing several at increased risk of experiencing circumstances linked to poor mental health such as financial distress related to lost income, feelings of uncertainty, isolation, and anticipatory grief[12]. Recent studies have found that the loss of social interaction, income, structure, and routine has led to psychological losses including loss of meaning, motivation, or self-worth among a range different people (e.g. gender, ethnic, age, and occupational backgrounds)[35].

Although studies have found an association between physical distancing and poor mental health outcomes, to our knowledge, this is the first study that examines the association in a university population, including faculty and staff, which is a uniquely vulnerable population in the context of the COVID-19 pandemic. In addition, to our knowledge, other studies have not

considered the impact of past community trauma or perceived social support in the association between physical distancing and poor mental health outcomes. Understanding whether past community trauma or perceived social support modify the physical distancing-mental health outcomes associations may allow public health professionals and university campuses to provide targeted interventions that consider these potential factors and empower the university community. Thus, the objective of this study was to evaluate the association between physical distancing and severe depression, severe anxiety, and high perceived stress; and, to determine if past community trauma or perceived social support modify the associations.

Conceptual Models

This study uses two conceptual models to explain what may be seen in the data – the Social Determinants of Mental Health[36] by as shown in Figure 1b and the Buffering Effect social support model by Cohen & Willis[37] as shown in Figure 2b. As shown in Figure 3b, a simplified conceptual model is presented to highlight the relationships in this study.

Figure 1b. Social and Cultural Determinants of Mental Disorders

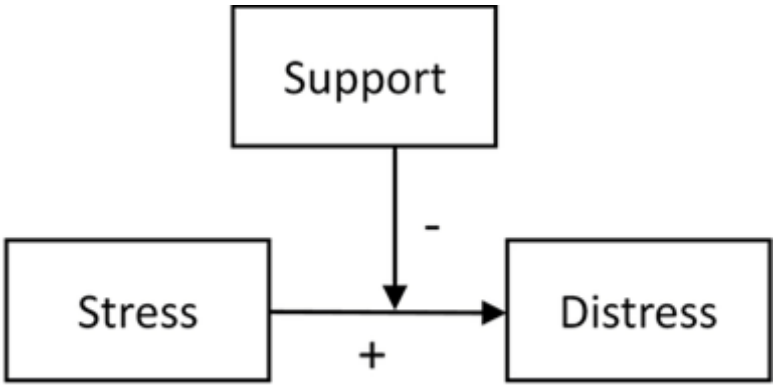

Figure 2b. Stress Buffering Model (Cohen & Willis, 1985)

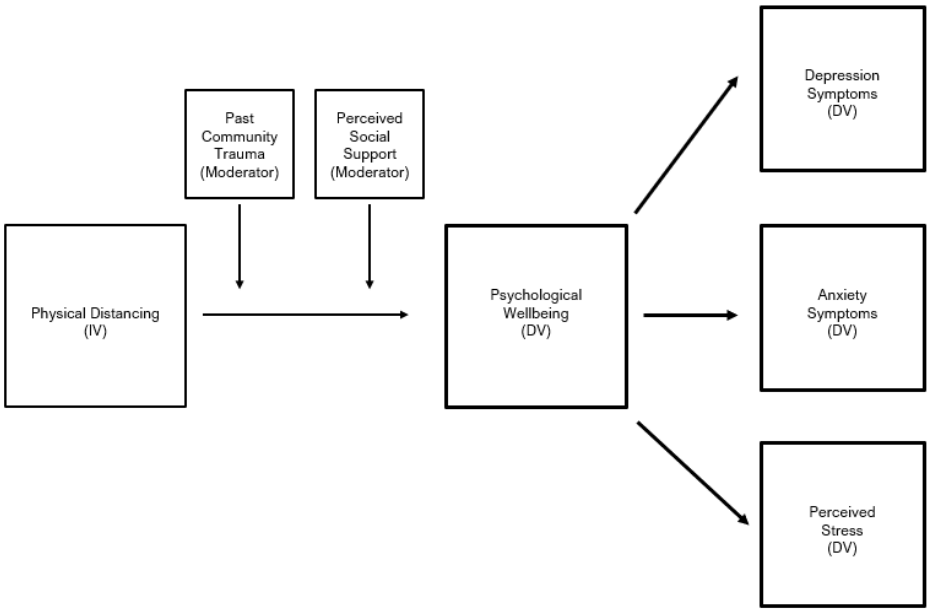

Figure 3b. Conceptual Model of Association Between Physical Distancing and Psychological Wellbeing

Social Support Model

There are two social support models by Cohen & Willis – the main effect and the buffering model. The main effect explains social relationships as being beneficial to the individuals regardless of whether they are under stress or not. The buffering effect model, which this study focuses on, explains social relationships and connectedness as a modifying factor and only related to wellbeing when the person is under stress; social relationships provide resources such as information, emotional support, or tangible resources which promote behavior changes. Research has shown that we do not need to be physically close to experience the benefits of social support. Rather, perceived social support is a stronger indicator of positive mental health outcomes. In this study, it is assumed, based on the literature, that strong social networks are important to psychological wellbeing and a social network's built environment – examined by looking at physical distancing – can play a role in supporting and encouraging stronger ties within social networks.

Social Determinants of Mental Health

Lund et al.[36] developed the Social and Cultural Determinants of Mental Disorders Model to develop a preliminary conceptual framework that aligned with the Sustainable Development Goals endorsed by the United Nations and to do a systematic review of literature on social determinants of mental disorders. This study included trauma and stress from the environmental domain and social support from the social cultural domain. Physical distancing and stay at home orders have been associated with an increase in anxiety and loneliness during this pandemic[13]. The distance creates a sudden change that individuals are often unprepared for, especially given how quickly changes occur. Reduced connections with others may increase loneliness and social isolation, both of which have been linked to poor mental health outcomes[13]. Based on the

literature, social networks are important to psychological wellbeing and the network's environment (physical closeness) can play a role in supporting and encouraging stronger ties within networks. This study assumes close proximity means that you are more likely to recognize and use those resources provided by your social network to reduce your stress.

Trauma and stress (proximal determinants) contribute to poor mental health outcomes. Exposure to community level violence has been linked to post-traumatic stress, depression, and anxiety[36]. At the University of North Carolina at Charlotte, the campus community is experiencing its third disaster in five years including the September 2016 shooting of Keith Lamont Scott and the violence that ensued quickly afterwards; the April 30, 2019 campus shooting that resulted in the death of two students and the left four other students injured, and now the COVID-19 pandemic. The former Chancellor at the time indicated that many employees continue to experience post event trauma, particularly as some staff reported that were not fully aware that the on-campus shooting was occurring and thus did not execute their expected roles and responsibilities during the event[38]. Most recently, the university community has been impacted by the 2020 COVID-19 Pandemic. Despite the negative outcomes that can arise from experiencing trauma and stress, they can also bring individuals and communities closer in what is described “social glue”[39, 40]. This study assumes that based on the literature, that those who have experienced past community trauma have an increased risk for experiencing poor mental health outcomes[41]. These conceptual models help to lay the theoretical basis to provide context to the relationships examined in the study.

Methods

Study Design & Population

The University of North Carolina at Charlotte (UNC Charlotte), a public 4-year university with bachelors, masters, certificate, and doctoral programs is known as North Carolina's "urban research institute"[42]. When data collection concluded in the Spring 2020 semester, almost 30,000 students were enrolled and over 1,100 faculty were employed by the university[43].

This cross-sectional study of an academic community used a web-based, online questionnaire to collect information on the psychological impact of COVID-19 as evidenced by anxiety symptoms, depression symptoms, and percieved stress. A pilot test was completed by a small sample of students at the university prior to sending out the final questionnaire to evaluate feasibility, average time for completion, and the accuracy of the instructions and questions as well as to make necessary adjustments. The university's Office of Institutional Research emailed the questionnaire via an anonymous link to every member of the university (approxtimately 31,000 individuals) who were working or enrolled at the university at the time of the study (December 2020).

The 129-item questionnaire took approximately 20 minutes to complete and included questions from validated scales that assessed/asked about depression symptoms, anxiety symptoms, perceived stress, loneliness, perceived social support, coping, and demographic data. There were also questions related specifically to the university community (i.e., role at the university, past community trauma at/near the university), and the various impacts to daily life due to the COVID-19 pandemic (i.e., housing, employment, stay at home and self-isolation orders).

The study was approved as "Exempt" by the University IRB with participants providing electronic informed consent. Questionniares were completed in one setting to ensure confidentiality. Participants could choose to enter their name in a drawing for a chance win a $50 gift card. At the end of the questionnaire the following was displayed: (1) a disclaimer to inform participants that the questionnaire was not diagnostic; (2) risk messaging if an individual scored "clinically significant risk" in the validated scales, and (3) information about relevant and useful emergency/crisis resources in their area.

Individuals who were working as faulty/staff or enrolled as a student prior to the start of the Spring 2020 semester (i.e., January 8, 2020) were eligible to complete the survey. Those who were newly enrolled students or newly hired faculty or staff (i.e. enrolled or hired Spring 2020 or later) were ineligible. A total of 1,373 individuals anonymously completed the online questionnaire. Prior to analysis, we excluded 22 participants who had completed the questionnaire in less than the average piloted time to complete (≤ 5 minutes) and/or who had insufficient/inadequate responses due to majority of questions skipped. The final population sample contained 1,351 participants.

Measures

Physical Distancing. The primary exposure variable, physical distancing, was coded as a binary variable and measured by asking "Have you maintained social distancing (also referred to as physical distancing) during this pandemic? Physical distancing is defined as 'keeping a safe space between yourself and other people who are not from your household when in public by keeping 6 feet, or 2 meters, from others.'"

Covariates. Based on a review of pertinent literature, the following variables were selected as potential covariates – gender, age, living status (living alone or with others), marital

status (single/never married, married/living together, divorced/widowed/separated), self-rated physical and mental health, relocation during the pandemic, race/ethnicity, annual household income, employment status during the pandemic, and role at the university (faculty, staff, student). We assessed a person's perceived (emotional and social) loneliness with the 6-item *DeJong Gierveld Loneliness Scale.* The scores range from 0 ("least lonely") to 6 ("most lonely"). While not a diagnostic tool, higher scores are associated with being lonelier. Based on the sample size in this study, this variable was coded as an ordinal variable (0-1 not/least lonely, 2-4 moderately lonely, and 5-6 most lonely). We also assessed if participants had a mental health diagnosis or symptoms prior to the pandemic (yes/no). Perception of degree of coping with the impact of the pandemic on overall life was measured using 5-point Likert scale response options ranging from "extremely well" to "not well at all."

Moderators. Two moderators were considered in the study. Past community trauma, measured as a binary variable, was assessed by asking participants whether or not they were enrolled or working during the semester that the two previous community traumas (off-campus shooting in 2016 and on-campus shooting in 2019) occurred.

One of the most widely used scales to measure social support[44], the 12-item *Multidimensional Scale of Perceived Social Support*, was used to measure the amount of social support an individual perceives that they can or have received from other sources (friends, family, and significant others or important person). Score ranged from 12 to 84 and the higher the score, the greater the amount of perceived social support. The scale has high internal consistency (Cronbach = 0.88) and moderate construct validity with scores negatively correlated with anxiety and depression scores[44]. The variable was coded as a binary variable: 12-60 low/medium perceived social support and 61-84 high perceived social support.

Outcome Variables. In this study, depression, anxiety, and stress are the indicators of psychological wellbeing and measured as three individual outcomes variables.

The 7-item *General Anxiety Disorder* (GAD-7) was used to measure the indicators and the associated possible symptomology of anxiety [45]. Anxiety was coded as an ordinal variable: 0-9 minimal/mild, 10-14 moderate, and ≥ 15 severe. The GAD-7 is a well validated screening tool with an excellent internal consistency (Cronbach $\alpha = 0.92$)[46, 47].

The *Patient Health Questionnaire* (PHQ-9) scale was used to measure the indicators and the associated possible symptomology of depression. The PHQ-9 is a well validated screening tool with a good internal consistency (Cronbach $\alpha = 0.88$); however, it is subject to inherent biases such as social desirability due to self-reporting [48]. This study excluded the 9th item (a suicidal screening question), "Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?" as real-time monitoring and immediate intervention based on the response to that item is not feasible [49]. The variable was coded as an ordinal variable: 0-9 low/mild, 10-14 moderate, 15-19 moderately severe, and ≥ 20 severe depression.

To measure the indicators and symptoms of perceived stress, the 10-item *Perceived Stress Scale-10* (PSS-10) was used[50]. Scores have been found to be significantly correlated with scores as expected compared to GAD-7 and PHQ-9[23] and have good internal consistency (Cronbach = 0.70) [51]. The scale is not a diagnostic tool and therefore does not have cut-off points; however, higher scores are associated with higher perceived stress[52]. The variable was coded as a binary variable: 0-20 low/moderate stress and 21-40 high perceived stress. Overall, the PSS-10 has "superior psychometric properties" compared to the 14-item and 4-item versions of the scale and has been primarily empirically evaluated in college students or workers[51].

These tools have been used during recent COVID-19 related studies in the general population [53-56] as well as in students [21].

Statistical Analysis. Frequencies and percentages of the sociodemographic characteristics of participants and outcomes were calculated. Ordinal logistic regression was used to provide an unadjusted measure of the association between physical distancing and severe anxiety and severe depression, while binary logistic regression was used to assess the association between physical distancing and perceived stress. We ran various collinearity diagnostics before forming the final models but did not find any evidence of collinearity. Multivariate ordinal (for the severe anxiety and severe depression outcomes) and binary (for the perceived stress outcome) logistic regression models, controlling for confounders, were created by including all the potential predictors in each model and then using a backwards elimination procedure to retain only predictor variables with $p < 0.20$[57].

Stratified analyses were used to evaluate whether past community trauma or perceived social support modified the physical distancing and psychological wellbeing association. All analytical procedures were conducted using SAS statistical software package, version 9.4.

Results

Demographic Characteristics of Study Population

Table 1 shows that the majority of the respondents were students (71.6%), female (71.0), Non-Hispanic White (60.0%), single/never married (56.6%), and less than 25 years of age (50.2%; Table 1). The majority of the participants reported engaging in physical distancing (91.3%). There were 6.1% participants with severe depression symptoms, 17.0% with severe anxiety symptoms, and 64.1% with high perceived stress. The majority of the sample had experienced past community trauma (76.7%) and perceived high social support (65.4%). Among

all participants, the primary concern or fear as it relates to the pandemic was related to mental health (24.6%), followed by employment (19.5%) and finances (17.4%).

Unadjusted Association Between Select Characteristics and Poor Mental Health Outcomes (Severe Anxiety Symptoms, Severe Depression Symptoms, and High Perceived Stress)

Those who identified as cisgender woman or genderqueer, younger than 34 years of age, being single/never married, experiencing mental health symptoms/diagnoses before the pandemic, perceived loneliness, having to relocate during the pandemic, being a student, and did not engage in physical distancing were all associated with statistically significant increased odds of reporting severe anxiety symptoms, severe depression symptoms, and perceiving high stress (Table 2). Specifically, those who identified as cisgender women had over twice the odds of reporting severe depression and anxiety, and perceiving high stress as compared to those who identified as cisgender man (depression OR: 2.15, 95% CI: 1.62, 2.82; anxiety OR: 2.71, 95% CI: 2.08, 3.59; perceived stress OR: 2.33, 95% CI: 1.81, 2.98). Similarly, those who reporting having mental health symptoms/diagnosis before the pandemic had over three times the odds of reporting severe depression and anxiety, and perceiving high stress as compared to those who did not report experiencing mental health symptoms/diagnosis before the pandemic (depression OR: 3.37, 95% CI: 2.67, 4.25; anxiety OR: 3.98, 95% CI: 3.14, 5.03; perceived stress OR: 3.59, 95% CI: 2.70, 4.76). Unique to severe depression, those who were unemployed had 1.51 times increased odds of experiencing severe depression than those who were employed (95% CI: 1.20, 1.89).

Individuals who self-rated their physical health as “fair/poor” during the pandemic had statistically significant increased odds of reporting severe depression and anxiety symptoms (severe depression: OR = 5.66, 95% CI: 4.19, 4.37; severe anxiety: OR = 4.21, 95% CI: 3.15,

5.63) as compared to those who self-rated their physical health as “excellent/very good,” but not with high perceived stress. Similarly, low/medium perceived social support was associated with twice the odds of severe depression and severe anxiety symptoms, but not high perceived stress (severe depression: 95% CI: 1.92, 2.99; severe anxiety: 95% CI: 1.62, 2.52).

The primary exposure, physical distancing was associated with increased odds of reporting severe depression symptoms (OR: 1.27; 95% CI: 0.88, 1.84), severe anxiety symptoms (OR: 1.27; 95% CI: 0.88, 1.85), and perceiving high stress (OR: 1.18; 95% CI: 0.79, 1.77).

Adjusted Associations between Reported Engagement in Physical Distancing and Psychological Impact

After adjustment, the physical distancing-severe depression magnitude remained largely unchanged (OR: 1.33; 95% CI: 0.88, 2.00). However, the association between physical-distancing and severe anxiety increased in magnitude for those who did not engage in physical distancing. Specifically, those who did not engage in physical distancing had 1.37 times the odds of severe anxiety as compared to those who engaged in physical distancing (95% CI: 0.89, 2.09). After adjustment, there was no association between physical distancing and high perceived stress (OR: 1.04; 95% CI: 0.66, 1.64).

Past Community Trauma as an Effect Moderator

In this sample, past community trauma appears to modify the exposure-outcome association between physical distancing and poor mental health outcomes such as depression and anxiety. Among those who reported exposure to past community trauma, those who did not engage in physical distancing had 1.54 times the odds of severe depression and 1.50 times the odds of severe anxiety as compared to those who did engage in physical distancing (95% CI: 0.94, 2.51 and 95% CI: 0.90, 2.49; respectively; Table 4b). In contrast, among those who did not

report exposure to past community trauma, those who did not engage in physical distancing had 1.10 times the odds of severe depression and 1.11 times the odds of severe anxiety as compared to those who engaged in physical distancing (95% CI: 0.50, 2.41 and 95% CI: 0.48, 2.55, respectively). Past community trauma was not a strong effect modifier of the physical distancing-perceived stress association (exposure to past community trauma OR:1.08, 95% CI: 0.63, 1.84 and no reported exposure to past community trauma OR: 0.94; 95% CI: 0.39, 2.28).

Perceived Social Support as an Effect Moderator

Perceived social support modified the association between physical distancing and severe depression symptoms as well as perceived stress; but it did not modify the association between physical distancing and severe anxiety symptoms. Among those who perceived low/medium social support, those who did not engage in physical distancing had 1.55 times the odds of severe depression symptoms and 0.81 times the odds of high perceived stress as compared to those who engaged in physical distancing (95% CI: 0.88, 2.74 and 95% CI: 0.41, 1.60, respectively; Table 5). By comparison, among those who perceived high social support, those who did not engage in physical distancing had 1.19 times the odds of severe depression symptoms and 1.29 times the odds of high perceived stress (95% CI: 0.65, 2.19 and 95% CI: 0.69, 2.39, respectively). Perceived social support was not a strong effect modifier of the physical distancing-severe anxiety association (low/medium perceived social support: OR: 1.46, 95% CI: 0.80, 2.67 and high perceived social support: OR: 1.30, 95% CI: 0.70, 2.41).

Discussion

In this university population, the results failed to support the hypothesis that physical distancing was associated with increased odds of poor mental health outcomes. On the contrary, those who did not engage in physical distancing had increased odds of severe anxiety symptoms,

severe depression symptoms. There was no association between the absence of physical distancing and perceiving higher stress. Although unexpected, recent literature supports the notion that engaging in physical distancing is not necessarily associated with poor mental health outcomes[56, 58-62]. It could also be argued that those who were not physically distant were doing so not by choice, but because of necessity (i.e. essential workers) and therefore had more stress or anxiety or depression. It is also possible that people who were already experiencing poor mental health were not engaging in physical distancing in order to continue connecting with their support systems. However, this does not explain the well documented association between physical distancing and isolation – isolation which has been linked to depression, anxiety and stress [13, 54, 63-67]. Lastly, it is possible that despite physical distancing being defined in the survey, participants may have interpreted that they were not engaging in physical distancing if they had roommates or engaged in social bubbles.

Every university community has stressors and challenges that will increase their community's susceptibility of experiencing the psychological impact of COVID-19 differently. Having experienced several disasters in a short period of time, this campus community is at an increased risk for poor mental health outcomes as evidenced by the findings that past community trauma modified the physical distancing-poor mental health (depression, anxiety, stress) relationship. Exposure to past community trauma increased the odds of experiencing severe depression symptoms and anxiety symptoms in those who did not physically distance. This finding broadly supports the work of other studies in this area linking community trauma with depression and anxiety[36, 68, 69].

Research has shown that we do not need to be physically close to experience the benefits of social support. Rather, perceived social support is a stronger indicator of positive mental

health outcomes. The feeling or perception of being cared for or connected mediates the long-term effects on distress experiences[27-29]. Research also supports the notion of perceived social support as a modifiable factor which validates the development of public health interventions that increase perceived social support[70]. This study assumed from the Social Support Model, that close proximity means that you are more likely to recognize and use those resources provided by your social network to reduce your stress. However, in this study, perceived social support did not appear to modify the relationship between physical distancing and severe anxiety symptoms. This may suggest that perceiving that supportive relationships are available does not buffer the association, but the perception of social support may instead act directly on anxiety.

It should be noted that social ties are not evenly experienced as beneficial to all people and vary with factors such as race, gender, and socioeconomic status[29]. Compared to men, women generally tend to experience higher rates of psychological distress but have more emotionally intimate relationships which may increase or decrease opportunities to be exposed or mitigate stress, use more social supports when stressed, and provide more frequent and effective social support when others are experiencing stress but may not receive the same support which may result in depression or sadness[29].

Strengths & Limitations

Due the cross-sectional nature of this study, causality cannot be determined; however, questions were worded in such a way as to attempt to maintain temporal sequence. Non-differential misclassification of the exposure and outcomes are possible as all of the variables measured in this study are self-reported. However, validated scales were used to measure three outcomes, anxiety symptoms, depression symptoms, perceived stress which helps to limit some of these concerns. Social desirability bias may occur because of the increased likelihood of

individuals responding in a socially acceptable or expected way given the sensitive nature of the exposure variable and the pervasive stigma associated with mental illness. However, the confidential and anonymous nature of this survey may reduce these concerns.

Selection bias is also possible as there was a low participation rate. Since the pandemic, recent research has suggested that response rates for online questionnaires have declined. Eligible people are experiencing “questionnaire fatigue,” since many forms of "safe" and physically distanced communication takes place via technology. This increased screen time may cause people to be on their computers and phones even more so than usual and people may want to take breaks from their devices[71, 72]. However, our response rate was similar to a previous study conducted with a university population[73]. We compared demographic characteristics of our population to the overall UNC Charlotte population and found that respondents were similar with respect to race/ethnicity and age. However, the study sample had a significantly higher percentage of cisgender women respond to the questionnaire than the percentage of cisgender women within the UNC Charlotte community. Stratification by gender was limited due to few cisgender men participating. Previous research has found that women are more likely to respond to online questionnaires than men[74].

This study also has several strengths. One main strength of the study is the large sample size (n = 1,351) which is comparable to other COVID-19 studies[65, 75-79]. Additionally, this study sampled a unique vulnerable population that is often not at the forefront of disaster research studies. These findings may be generalizable to other university populations in the U.S, particularly those in urban locations. This study also highlights need for interventions aimed to reduce poor mental health outcomes given that in this study those who did not engage in physical distancing experienced higher odds of severe depression and anxiety symptoms, and perceived

higher stress at the time of the survey. Given the necessity and apparent effectiveness of physical distancing interventions in slowing the spread, public health officials and agencies may benefit from inclusion or consideration of the differences noted in those who are not engaging in physical distancing in order to create targeted responses and interventions.

Conclusion

Most studies highlight that isolation and loneliness, common experiences during the beginning of the pandemic, were linked to poor mental health outcomes. This study also provides a significant contribution by highlighting potentially at-risk groups – those who were not engaging in physical distancing and those who have experienced past community trauma. While the numbers experiencing trauma were small, the elevated odds ratio suggest that past trauma may be a needed priority population for inclusion in university-based mental health outreach. Interventions should take account to address needs of these groups as the current pandemic may require unique attention and support for them. This study also makes a contribution by examining the effects of perceived social support and exposure to past community trauma on a university population. It also shows that perceived social support can buffer the effects of severe depression and anxiety while past community trauma can increase one's odds of experiencing severe depression and anxiety among those who have not engaged in physical distancing. As such, this study challenges the widespread assumption that engaging in physical distancing leads to poor mental health. The pandemic is likely to have lasting impacts on mental health, particularly as varying levels of distancing are continued. It is important for the role of social support to be examined and understood to increase overall community psychological wellbeing. Future studies should examine different forms of social support, so that interventions empower

individuals to rely more on the social capital that already exists to reduce potential or existing psychological impairment from the disaster.

Table 1b: Sociodemographics of University Community in Psychological Impact Analysis (n=1,351); Study on Psychological Impact of COVID-19 on University Community, 2020-2021

Sociodemographic	N (%)
Gender[15]	
Cisgender Man	358 (26.64)
Cisgender Woman	954 (70.98)
Genderqueer	32 (2.36)
Race	
White	811 (60.03)
Black	153 (11.32)
Other[16]	83 (6.14)
Asian	157 (11.62)
Hispanic/Latinx	119 (8.81)
Missing[17]	28 (2.07)
Age	
18-24	678 (50.19)
25-34	201 (14.88)
35-54	174 (12.88)
55-72	258 (19.10)
Unknown/Missing	40 (2.96)
Marital Status[18]	
Single/Never Married	764 (56.59)
Married/ Living Together/Partner	529 (39.19)
Divorced/Separated/Widowed	57 (4.22)
Employment Status During Pandemic[19]	
Employed Error! Bookmark not defined.	934 (69.24)
Unemployed[20]	415 (30.76)
Annual Household Income	
$0- 24,999	370 (27.39)
$25,000-49,999	202 (14.95)
$50,000-74,999	201 (14.88)
$75,000-99,999	156 (11.55)
$100,000+	305 (22.58)
Prefer not to Answer	117 (8.66)
Role at University	
Student	967 (71.58)
Faculty and Staff	384 (24.82)
Relocated outside of Charlotte, NC[21]	
Yes	289 (21.52)
No	1054 (78.48)
Mental Health Diagnoses/Symptoms Before	
Yes	415 (30.72)
No	851 (65.51)
Prefer Not to Answer	51 (3.77)
Would Get Vaccine When Available	
Yes	811 (60.03)
No	165 (12.21)
Undecided	375 (27.76)
Self-rated Physical Health During Pandemic[22]	
Excellent/Very Good	400 (29.74)
Good	445 (33.09)
Fair/Poor	500 (37.17)
Engaged in Physical Distancing	
Yes	1234 (91.34)

[15] Number of Missing Participants: 7
[16] Bi/Multi-racial· American Indian/Alaska Native, NHOPI, Other
[17] Prefer not to Answer, Unknown/Missing
[18] Number of Missing Participants: 1
[19] Number of Missing Participants: 2
[20] Student, Retired, Disabled
[21] Number of Missing Participants: 8
[22] Number of Missing Participants: 6

No	117 (8.66)
Perception of Degree of Coping[23]	
Extremely Well/Very Well	394 (29.221)
Moderately Well/**Slightly Well**	621 (46.03)
Not at All	334 (24.76)
Biggest Concern or Fear During Pandemic	
Household Concerns [24]	28 (2.08)
Employment	150 (11.14)
Finances	263 (19.52)
Family[25]	234 (17.37)
Physical Health	188 (13.96)
Mental Health	331 (24.57)
Academics/School	153 (11.36)
Exposed to Community Trauma	
Yes	1037 (76.66)
No	314 (23.34)
Perceived Social Support	
Low/Medium	467 (34.87)
High	884 (65.43)
Depression Symptoms	
None/Mild	852 (63.06)
Moderate	261 (19.32)
Moderate-Severe	156 (11.55)
Severe	82 (6.07)
Anxiety Symptoms	
None/Mild	850 (62.92)
Moderate	272 (20.13)
Severe	229 (16.95)
Perceived Stress	
Low/Medium	485 (35.90)
High	866 (64.10)

[23] Number of Missing Participants: 2
[24] Housing & Groceries/Food
[25] Adult Care, Child Care, Family Wellbeing

Table 2b. Unadjusted ORs and 95% CIs for the Association between Sociodemographic and Lifestyle Variables and Severe Depression Symptoms, Severe Anxiety Symptoms, and High Perceived Stress; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Depression Symptoms		Severe Anxiety Symptoms		High Perceived Stress	
Variables	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Physical Distancing						
Yes	1.00	Referent	1.00	Referent	1.00	Referent
No	1.27	0.88 – 1.84	1.27	0.88 – 1.85	1.18	0.79 – 1.77
Gender						
Cisgender Man	1.00	Referent	1.00	Referent	1.00	Referent
Cisgender Woman	2.15*	1.64 – 2.82	2.71*	2.08 – 3.59	2.33*	1.81 – 2.98
Genderqueer	7.65*	3.91 – 14.93	5.53*	2.78 – 11.01	7.32*	2.52 – 21.25
Age						
18 – 24	4.21*	2.97 – 5.98	4.63*	3.24 – 6.62	2.20*	1.64 – 2.95
25 – 34	2.84*	1.86 – 4.34	3.01*	1.96 – 4.62	2.03*	1.38 – 2.98
35 – 54	1.38	0.86 – 2.22	1.50	0.93 – 2.43	0.90	0.62 – 1.33
55 – 72	1.00	Referent	1.00	Referent	1.00	Referent
Missing	3.44	1.74 – 6.78	4.07*	2.06 – 8.05	3.19*	1.46 – 6.96
Marital Status						
Single/Never Married	1.72*	1.36 – 2.16	1.65*	1.31 – 2.07	1.46*	1.16 -1.84*
Married/Living Together/Partner	1.00	Referent	1.00	Referent	1.00	Referent
Divorced/Widowed/Separated	0.71	0.38 – 1.34	0.52	0.26 – 1.02	0.95	0.55 – 1.65
Self-Rated Physical Health During Pandemic						
Excellent/Very Good	1.00	Referent	1.00	Referent	1.00	Referent
Good	1.99*	1.45 – 2.74	1.89*	1.39 – 2.57	1.29	0.98 -1.69
Fair/Poor	5.66*	4.19 – 7.64	4.21*	3.15 – 5.63	2.28	1.72 – 3.02
Experienced Mental Health Symptoms/Diagnosis Before Pandemic						
Yes	3.37*	2.67 – 4.25	3.98*	3.14 – 5.03	3.59*	2.70-4.76
No	1.00	Referent	1.00	Referent	1.00	Referent
Prefer Not to Answer	2.56*	1.49 – 4.37	2.51*	1.46 – 4.33	1.33	0.74- 2.39
Perceived Loneliness						
Not/Least Lonely	1.00	Referent	1.00	Referent	1.00	Referent
Moderately Lonely	4.72*	3.00 – 7.44	5.92*	3.67 – 9.54	1.94*	1.45 – 2.60
Most Lonely	16.22*	10.28 – 25.60	17.44*	10.78 – 28.20	3.71*	2.69 – 5.11
Income						
$0 – 24,999	1.00	Referent	1.00	Referent	1.00	Referent
$25,000 – 49,999	0.80	0.58 – 1.12	0.81	0.58 – 1.31	0.73	0.51 – 1.04
$50,000 – 74,999	0.47*	0.33 – 0.67	0.64*	0.45 – 0.90	0.69*	0.48 – 0.99
$75,000 – 99,999	0.45*	0.30 – 0.66	0.52*	0.35 – 0.77	0.71	0.48 – 1.04
≥$100,000	0.47*	0.34 – 0.64	0.53*	0.39 – 0.73	0.61*	0.44 – 0.84
Prefer Not to Answer	0.79	0.53 – 1.18	0.86	0.58 – 1.29	0.93	0.60 – 1.45
Race/Ethnicity						
Non-Hispanic White	1.00	Referent	1.00	Referent	1.00	Referent
Non-Hispanic Black	0.82	0.57– 2.53	0.80	0.56 – 1.15	0.71	0.50 – 1.00
Other (AIAN, Asian, NHOPI, Bi/Multiracial)	1.65*	1.07 – 2.53	0.99	0.63 – 1.56	1.32	0.80 – 2.19
Asian	1.01	0.72 – 1.43	0.86	0.61 – 1.22	0.72	0.51 – 1.02
Prefer Not to Answer	1.29	0.88 – 1.88	1.08	0.73 – 1.58	0.84	0.56 – 1.24
Hispanic/Latinx	1.74	0.86 – 3.54	1.27	0.61 – 2.63	0.44*	0.21 – 0.94
Relocate						
Yes	1.94*	1.51 – 2.49	2.26*	1.76 – 2.90	1.60*	1.21 – 2.14
No	1.00	Referent	1.00	Referent	1.00	Referent
Role at University						
Student	2.95*	2.24 – 3.88	2.84*	2.17 -3.74	1.97*	1.55 – 2.52
Faculty & Staff	1.00	Referent	1.00	Referent	1.00	Referent

Employment Status During Pandemic						
Employed	1.00	Referent	1.00	Referent	1.00	Referent
Unemployed	1.51*	1.20 – 1.89	1.25	1.00 – 1.58	1.03	0.81 – 1.32
Exposed to Community Trauma						
Yes	0.78	0.61 – 1.00	0.85	0.66 – 1.10	0.95	0.73 – 1.24
No	1.00	Referent	1.00	Referent	1.00	Referent
Perceived Social Support						
Low/Medium	2.39*	1.92 – 2.99	2.02*	1.62 – 2.52	1.29	1.02 – 1.64
High	1.00	Referent	1.00	Referent	1.00	Referent

Table 3b. Adjusted ORs and 95% CIs for the Association between Physical Distancing and Severe Depression Symptoms, Severe Anxiety Symptoms, and High Perceived Stress; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Depression Symptoms†		Severe Anxiety Symptoms‡		High Perceived Stress∞	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Physical Distancing						
Yes	1.00	Referent	1.00	Referent	1.00	Referent
No	1.33	0.88 – 2.00	1.37	0.89 – 2.09	1.04	0.66 – 1.64

Abbreviations: CI, confidence interval; OR, odds ratio.

† Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, role at the university, and perceived social support.

‡ Adjusted for gender, age, marital status, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and relocating during the pandemic.

∞ Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, race/ethnicity, role at the university, and employment status during the pandemic.

*p-value: ≤0.05

- A dash (-) denotes these variables were not included in the final model for the outcome (see Methods).

Table 4b. Adjusted ORs and 95% CIs for the Association between Physical Distancing and Severe Depression Symptoms, Severe Anxiety Symptoms, and High Perceived Stress; Stratified by Exposure to Past Community Trauma; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

		Past Exposure to Community Trauma	
		Yes	**No**
Outcome	*Exposure*	**OR (95% CI)**	**OR (95% CI)**
	Physical Distancing		
Severe Depression†	Yes	1.00 (Referent)	1.00 (Referent)
	No	1.54 (0.94 – 2.51)	1.10 (0.50 – 2.41)
Severe Anxiety‡	Yes	1.00 (Referent)	1.00 (Referent)
	No	1.50 (0.90 – 2.49)	1.11 (0.48 – 2.55)
High Perceived Stress∞	Yes	1.00 (Referent)	1.00 (Referent)
	No	1.08 (0.63 – 1.84)	0.94 (0.39 – 2.28)

Abbreviations: CI, Confidence Interval; OR, Odds Ratio.

† Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, role at the university, and perceived social support.

‡ Adjusted for gender, age, marital status, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and relocating during the pandemic.

∞ Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, race/ethnicity, role at the university, and employment status during the pandemic.

*p-value: ≤0.05

Table 5b. Adjusted ORs and 95% CIs for the Association between Physical Distancing and Severe Depression, Severe Anxiety, and High Perceived Stress Stratified by Perceived Social Support; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

		Perceived Social Support	
		Low/Medium OR (95% CI)	**High OR (95% CI)**
Outcome	*Exposure* **Physical Distancing**		
Severe Depression†	Yes	1.00 (Referent)	1.00 (Referent)
	No	1.55 (0.88 – 2.74)	1.19 (0.65 – 2.19)
Severe Anxiety‡	Yes	1.00 (Referent)	1.00 (Referent)
	No	1.46 (0.80 – 2.67)	1.30 (0.70 – 2.41)
High Perceived Stress∞	Yes	1.00 (Referent)	1.00 (Referent)
	No	0.81 (0.41 – 1.60)	1.29 (0.69 – 2.39)

Abbreviations: CI, Confidence Interval; OR, Odds Ratio.

† Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and role at the university.

‡ Adjusted for gender, age, marital status, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and relocating during the pandemic.

∞ Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, race/ethnicity, role at the university, and employment status during the pandemic.

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CHAPTER 4: THE ROLE OF PERCIEVED SOCIAL SUPPORT AND RESILIENT COPING ON THE ASSOCIATION BETWEEN PERCEIVED STRESS AND POOR MENTAL HEALTH OUTCOMES: A STUDY ON THE PSYCHOLOFICAL IMPACT OF COVID-19 ON A UNIVERISTY COMMUNITY

Introduction

The coronavirus SARS-CoV-2 which originated in December 2019 in Wuhan, China, has led to the COVID-19 pandemic which has now spread to more than 425.6 million cases and led to more than 5.9 million deaths in 224 countries (Van Bavel et al., 2020). In the United States (U.S.), there have been 79 million cases and 955,135 deaths to date (Centers for Disease Control and Prevention, 2022). Concurrently, the world continues to experience unprecedented socio-economic, political, and psycho-social impacts as a result of the ongoing pandemic (Banerjee & Rai, 2020). One of the primary concerns of public mental health researchers now is the increased risk for anxiety and depression. This concern is supported by past epidemics, such as in 2003 SARS and 2009 H1N1(Pfefferbaum & North, 2020) outbreaks, which negatively impacted mental health in the general population.

An estimated one in five Americans suffer from a diagnosable mental disorder, such as depression or anxiety in a given year (Johns Hopkins Medicine, 2022). Globally, mental health disorders are one of the top causes for disability – with depression as the leading cause of disability worldwide (National Alliance on Mental Illness, 2022). During the pandemic, the global prevalence of mental distress, anxiety, and depression was found to be 50.0%, 26.9%, 28.0% respectively (Nochaiwong et al., 2021). In the U.S., more than 42% of adults reported symptoms of depression or anxiety in December 2021, an 11% increase from the previous year (Abbott, 2021).

There are a host of examples of the emotional toll that COVID-19 will have on individuals including stress, depression, insomnia, panic attacks, delirium, anxiety, helplessness,

and frustration (Ho et al., 2020; Pfefferbaum & North, 2020). Stress may occur in a community, even if infection rates or risk to exposure is low, because of the social disruption and economic challenges the pandemic has caused for individuals. Recent COVID-19 related studies have found that perceived stress, defined as an individual's perception of how "unpredictable, uncontrollable, and overloaded" they find their lives or recent situation to be (Cohen et al., 1994), can increase anxiety and depression symptoms (Babicka-Wirkus et al., 2021; Barros & Sacau-Fontenla, 2021; Catabay et al., 2019; Du et al., 2020; Hou et al., 2021; Jianjun et al., 2020; F. Li et al., 2021; Liu et al., 2021; Mariani et al., 2020; Xu et al., 2020; Yan et al., 2021; Yang et al., 2021). Perceived stress can also lead to poor physical and mental health including premature mortality (Gayman et al., 2011; Keller et al., 2012; Olson & Surrette, 2004; Peters & McEwen, 2015). One of the earliest studies conducted during the initial outbreak highlighted students suffering from higher psychological distress than the general population (Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020). While an increased perception of stress and thus the experience of increased anxiety or depression symptoms is a normal reaction, if the acute response is not addressed, individuals may be more likely to experience long lasting or more serious mental health problems (Zuercher et al., 2020).

At the time this study was conducted, the disease itself had an uncertain trajectory, unknown spread and transmission, and unclear health outcomes which likely increased anxiety that people experienced – worsened by issues like isolation in lockdown and ongoing surges in cases (Banerjee & Rai, 2020; Palsson et al., 2020). This is especially true for the estimated half of the U.S. population who are considered vulnerable because of current social circumstances.

University students are uniquely vulnerable as they experience the daily stressors of college life including limited financial resources and lack of sufficient living spaces and reliable

transportation. This places them at greater risk for stress related conditions such as weakened immune systems, anxiety, depression, self-harm, and suicidal ideation (Liu et al., 2019). A great deal of the COVID-related literature that included a university population included primarily students and was conducted outside the U.S., particularly from China as this is where the virus was first detected (Cao et al., 2020; Du et al., 2020; Gandhi et al., 2020; González-Sanguino et al., 2020; Limcaoco et al., 2020; Odriozola-González et al., 2020; Sahu, 2020; Sartorao Filho et al., 2020; Ye et al., 2020; Zhai & Du, 2020).

Conceptual Models & Frameworks

This study uses two conceptual models to explain what may be seen in the data – the Social Determinants of Mental Health by Lund, et al. (2018) as shown in Figure 1c and the Buffering Effect social support model by Cohen & Willis (1985) as shown in Figure 2c. As shown in Figure 3c, a simplified conceptual model is presented to highlight the relationships in this study. These conceptual models serve as a theoretical basis and provide context to the relationships examined in this study.

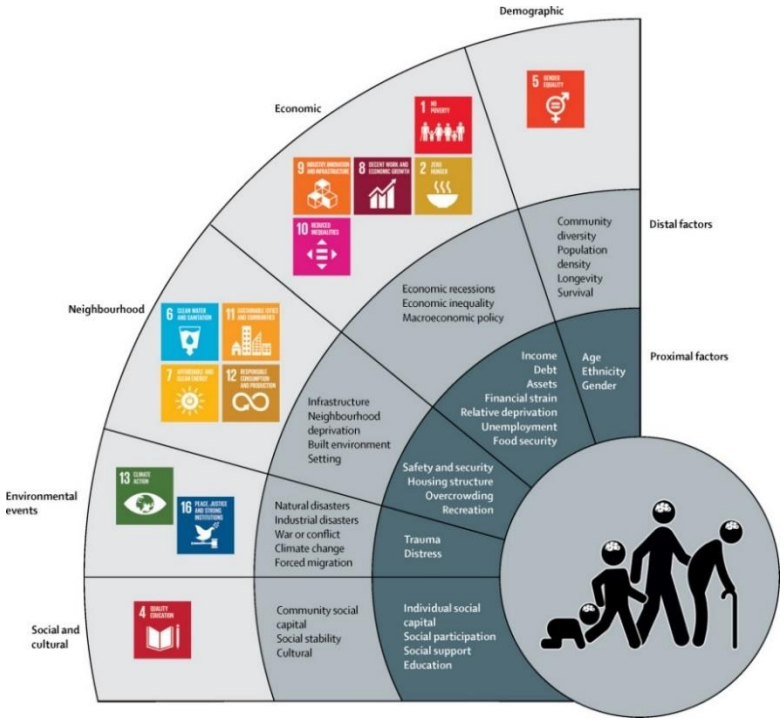

Figure 1c. Social and Cultural Determinants of Mental Disorders (Lund et al. 2018)

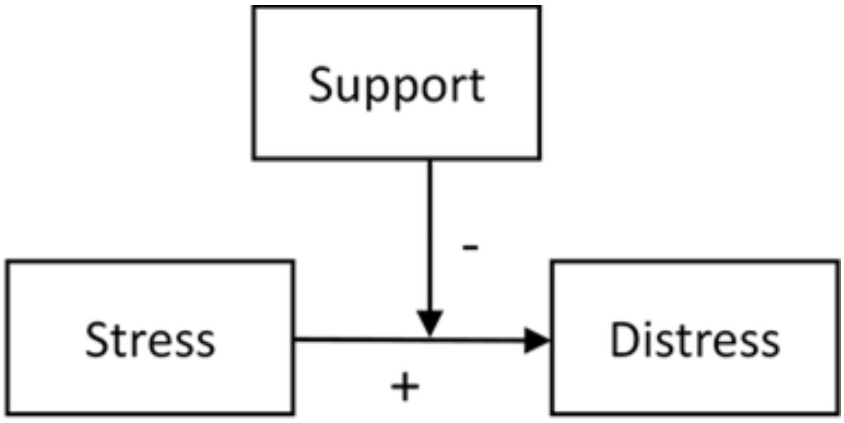

Figure 2c. Stress Buffering Model (Cohen & Willis, 1985)

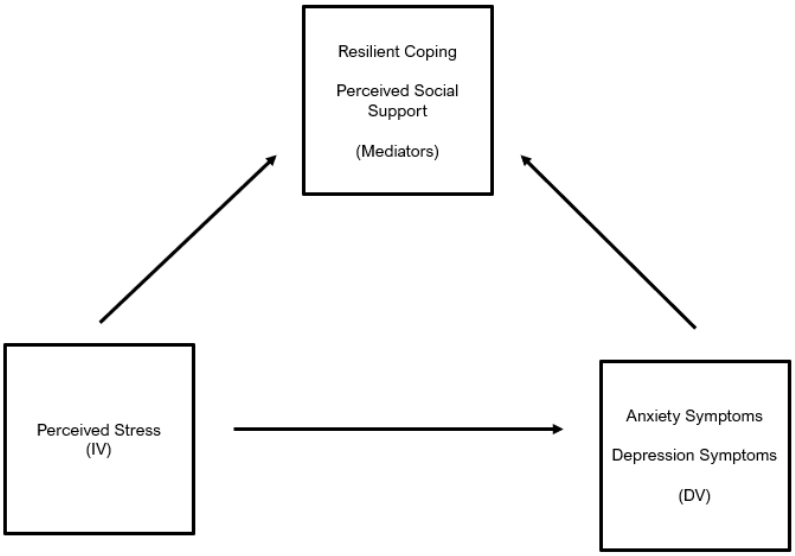

Figure 3c. Conceptual Model of Association Between Perceived Stress and Depression and Anxiety Symptoms

Lund et al. (2018) developed the Social and Cultural Determinants of Mental Disorders to provide a preliminary conceptual framework that aligned with the Sustainable Development Goals endorsed by the United Nations and then use the framework to systematically review existing literature surrounding social determinants of mental disorders. The framework included two determinants directly applicable to this study: (1) stress from the environmental events domain and (2) social support from the social and cultural domain. The Buffering Effect social support model explains that relationships are beneficial only when someone is under stress and serves to modify that association between stress and distress (Cohen & Wills, 1985).

Social relationships provide resources which promote behavior changes or neuroendocrine responses to stressors. In other words, it buffers the negative influences that stressors may have on health. Several studies have noted that when under stress, having the perception of social support may buffer the full impact of stress by increasing coping abilities (Flesia et al., 2020; Fullana et al., 2020; Kawachi & Berkman, 2001; Yan et al., 2021).

One such ability is resilient coping – a process that occurs when someone copes with stress in a highly adaptive manner that demonstrates active problem solving and flexible coping. The relationship between resilience and depression and anxiety has been noted in prior literature (Cheng, 2001; Waugh & Küster, 2015). This is because the more individuals perceive stress during this time, the more anxiety or depression symptoms they may have, generated because of their lack of ability to respond adaptively, and recover from those additional stressors in resilient ways (Perrin et al., 2009). Few studies have evaluated resilient coping as an effect modifier of the association between perceived stress and anxiety and/or depression (Du et al., 2020; Liu et al., 2021; Xu et al., 2020; Yan et al., 2021; Yang et al., 2021). It should be noted that these studies are (1) generally conducted in international populations outside the U.S., such as China, Australia, Jordan; and (2) few have been conducted with students but exclude faculty and staff (X. Li et al., 2021; Ye et al., 2020). Moreover, fewer studies have used the Brief Resilient Coping Scale (BRCS) to examine resilient coping as a mediator (Rahman et al., 2021). The purpose of this study was to evaluate the association between perceived stress and depression and anxiety symptoms, with resilient coping and social support as potential mediators of this relationship, in a large university community, including faculty, students, and staff.

Methods

Study Design & Population

The University of North Carolina at Charlotte (UNC Charlotte), a public 4-year university with bachelors, masters, certificate, and doctoral programs is known as North Carolina's "urban research institute" (UNC Charlotte, 2020). When data collection concluded in the Spring 2020 semester, almost 30,000 students were enrolled and over 1,100 faculty were employed by the university (Office of Institutional Research, 2019).

This cross-sectional study of an academic community used a web-based, online questionnaire to collect information on the psychological impact of COVID-19 as evidenced by anxiety symptoms, depression symptoms, and percieved stress. A pilot test was completed by a small sample of students at the university prior to sending out the final questionnaire to evaluate feasibility, average time for completion, and the accuracy of the instructions and questions as well as to make necessary adjustments. The university's Office of Institutional Research emailed the questionnaire via an anonymous link to every member of the university (approximately 31,000 individuals) who were working or enrolled at the university at the time of the study (December 2020).

The 129-item questionnaire took approximately 20 minutes to complete and included questions from validated scales that assessed/asked about depression symptoms, anxiety symptoms, perceived stress, loneliness, perceived social support, coping, and demographic data. There were also questions related specifically to the university community (i.e., role at the university), and the various impacts to daily life due to the COVID-19 pandemic (i.e., housing, employment, stay at home and self-isolation orders).

The study was approved as "Exempt" by the University IRB with participants providing electronic informed consent. Questionnaires were completed in one sitting to ensure confidentiality. Participants could choose to enter their name in a drawing for a chance win a $50 gift card. At the end of the questionnaire the following were displayed: (1) a disclaimer to inform participants that the questionnaire was not diagnostic; (2) risk messaging if an individual scored "clinically significant risk" in the validated scales, and (3) information about relevant and useful emergency/crisis resources in their area.

Individuals who were working as faulty/staff or enrolled as a student prior to the start of the Spring 2020 semester (i.e., January 8, 2020) were eligible to complete the survey. Those who were newly enrolled students or newly hired faculty or staff (i.e. enrolled or hired Spring 2020 or later) were ineligible. A total of 1,373 individuals anonymously completed the online questionnaire. Prior to analysis, we excluded 22 participants who had completed the questionnaire in less than the average piloted time to complete (≤ 5 minutes) and/or who had insufficient/inadequate responses due to majority of questions skipped. The final sample contained 1,351 participants.

Measures

Perceived Stress. To measure the indicators and symptoms of perceived stress, the 10-item *Perceived Stress Scale-10* (PSS-10) was used (Cohen et al., 1994). Scores have been found to be significantly correlated as expected with scores compared to GAD-7 and PHQ-9 (Limcaoco et al., 2020) and have good internal consistency (Cronbach = 0.70) (Lee, 2012). The scale is not a diagnostic tool; however, higher scores are associated with higher perceived stress (Kecojevic, et al., 2020). The variable was coded as a binary variable for analysis: 0-20 low/moderate stress and 21-40 high perceived stress. Overall, the PSS-10 has "superior psychometric properties" compared to the 14-item and 4-item versions of the scale and has been primarily empirically evaluated in college students or workers (Lee, 2012).

Covariates. Based on a review of pertinent literature, the following variables were selected as potential covariates: gender, age, living status (living alone or with others), marital status (single/never married, married/living together, divorced/widowed/separated), self-rated physical and mental health, relocation during the pandemic, race/ethnicity, annual household income, employment status during the pandemic, and role at the university (faculty, staff,

student). We assessed a person's perceived (emotional and social) loneliness with the 6-item *DeJong Gierveld Loneliness Scale.* The scores range from 0 ("least lonely") to 6 ("most lonely"). While not a diagnostic tool, higher scores are associated with being lonelier. Based on the sample size in this study, this variable was coded as an ordinal variable (0-1 not/least lonely, 2-4 moderately lonely, and 5-6 most lonely). We also assessed if participants had a mental health diagnosis or symptoms prior to the pandemic (yes/no). Perception of degree of coping with the impact of the pandemic on overall life was measured using 5-point Likert scale response options ranging from "extremely well" to "not well at all."

Mediators. Two mediators were considered in the study. Resilient coping, measured as a binary variable, was assessed by using The *Brief Resilient Coping Scale* (BRCS). The reliability and validity of the 4-item scale has been tested previously (Sinclair & Wallston, 2004). The BRCS has been used as a measure in several COVID-19 related studies primarily among healthcare workers (Ghandi, et al., 2020; Labrague, et al., 2020) and the general population (Rahman, et al., 2020; Soonthornchaiya, 2020). Using a Likert scale, scores range from 4 to 20 points with 4 indicating "low resilient copers" and 20 indicating "high resilient copers." Resilient coping was coded as a binary variable: 0-9 low/medium resilient coping and $\geq$ 10 high resilient coping.

One of the most widely used scales to measure social support (Dambi, et al., 2018), the 12-item *Multidimensional Scale of Perceived Social Support* (MSPSS), was used to measure the amount of social support an individual perceives that they can or have received from other sources (i.e., friends, family, and significant others or important person). Scores range from 12 to 84 and the higher the score, the greater the amount of perceived social support. The scale has high internal consistency (Cronbach = 0.88) and moderate construct validity with scores

negatively correlated with anxiety and depression scores (Dambi, et al., 2018). The variable was coded as a binary variable: 12-60 low/medium perceived social support and 61-84 high perceived social support.

Outcome Variables. In this study, depression and anxiety are the indicators of psychological wellbeing and measured as two individual outcome variables. The *General Anxiety Disorder* (GAD-7) and *Patient Health Questionnaire* (PHQ-9) have been used during recent COVID-19 related studies in the general population (Agberotimi et al., 2020; Liu et al., 2020; Naser et al., 2020; Zhu et al., 2020) as well as in students (Sartorao Filho et al., 2020).

The 7-item *General Anxiety Disorder* (GAD-7) was used to measure the indicators and the associated possible symptomology of anxiety (Toussaint et al., 2020). Anxiety was coded as a binary variable: 0-9 minimal/mild anxiety and ≥ 10 moderate/severe anxiety. The GAD-7 is a well validated screening tool with excellent internal consistency (Cronbach $\alpha = 0.92$) (Spitzer et al., 2006; Lowe, et al., 2008).

The *Patient Health Questionnaire* (PHQ-9) scale was used to measure the indicators and the associated possible symptomology of depression. The PHQ-9 is a well validated screening tool with good internal consistency (Cronbach $\alpha = 0.88$); however, it is subject to inherent biases such as social desirability due to self-reporting (Zuithoff et al., 2010). This study excluded the 9th item (a suicidal screening question), “Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?” as real-time monitoring and immediate intervention based on the response to that item was not feasible (Kroenke et al., 2009). The variable was coded as a binary variable: 0-9 low/mild depression and ≥ 10 moderate/severe depression.

Statistical Analysis

Frequencies and percentages of the sociodemographic characteristics of participants and outcomes were calculated. Logistic regression was used to provide an unadjusted measure of the

association between perceived stress and severe anxiety and severe depression. We ran various collinearity diagnostics before forming the final models but did not find any evidence of collinearity. Multivariate logistic regression models, controlling for confounders, were created by including all the potential predictors in each model and then using a backwards elimination procedure to retain only predictor variables with $p < 0.20$(Budtz–Jørgensen et al., 2007).

To understand more accurately whether resilient coping or social support directly affected and partially mediated the relationships between exposure and outcomes, mediation analyses were conducted. Mediation analysis consisted of four steps which followed the recognized requirements for testing mediation (Baron & Kenny, 1986): (1) the risk factor (i.e., perceived stress) should predict the outcome (i.e., anxiety and depression symptoms); (2) the risk factor should predict the mediator (i.e., resilient coping and perceived social support); (3) the mediator (resilient coping and perceived social support) should be significantly associated with the outcome (anxiety and depression symptoms); and (4) the effect of the risk factor (i.e., perceived stress) on the outcome (anxiety and depression symptoms) should be attenuated when the mediator (resilient coping and perceived social support) is statistically controlled. All analytical procedures were conducted using SAS statistical software package, version 9.4.

Results

Among this sample, most of the participants were female (71.0%), white (60.0%), younger than 25 years old (50.2%), single/never married (56.7%), employed at the time of the survey (69.2%), and students (71.2%). The majority also perceived high social support (65.43%) and a tendency to engage in medium or highly resilient coping during this time (69.3%; Table 1).

In the unadjusted findings, those who were cisgender women had over twice the odds of severe depression and anxiety when compared to those who identified as cisgender man (OR:

2.12, 95% CI: 1.61, 2.78 and OR: 2.78, 95% CI: 2.09, 3.70, respectively; Table 2). Those who had reported experiencing mental health symptoms/diagnosis prior to the pandemic had 3.28 times the odds of severe depression and 4.94 times the odds of severe anxiety (95% CI: 2.75, 4.19 and 95% CI: 3.16, 5.17, respectively). Individuals who scored as most lonely had 14.80 times the odds of reporting severe depression symptoms and 16.54 times the odds of reporting severe anxiety symptoms as compared to those who reported being not or least lonely (95% CI: 9.37, 23.39 and 95% CI: 10.22, 26.77, respectively; Table 2). In addition, those who perceived themselves to have low/medium social support and those who reported low resilient coping had over two times the odds of reporting severe depression (OR: 2.38, 95% CI: 1.89, 3.74 and OR: 2.95, 95% CI: 2.32, 3.74, respectively) and anxiety symptoms (OR: 2.05, 95% CI: 1.63, 2.58 and OR: 2.44, 95% CI: 1.93, 3.10, respectively) as compared to those who perceived themselves to have high social support and medium/high resilient coping.

High perceived stress was statistically significantly associated with increased odds of both severe depression and anxiety in the unadjusted model. Individuals with high perceived stress had 5.70 times the odds of severe depression and 13.98 times the odds of severe anxiety symptoms as compared to those who had low perceived stress (95% CI: 4.29, 7.57 and 9.74, 20.05, respectively). The magnitudes of the perceived stress-severe depression and severe anxiety association were attenuated after adjustment for coping, but remained statistically significant. Specifically, after adjustment for gender, race/ethnicity, age, self-rated physical health during pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and level of resilient coping, individuals with high perceived stress had over three-fold increased odds of depression (OR: 3.69, 95% CI: 2.65, 5.14; Table 3). After

adjustment, individuals with high perceived stress had over 11 times the odds of anxiety as compared to individuals with low perceived stress (OR: 11.10, 95% CI: 7.39, 16.67).

Results for steps 1, 2, 3 and 4 of the mediation analyses are displayed in Tables 4c and 5c. The potential mediators (perceived social support and resilient coping) were both associated with the outcomes. Perceived stress predicted anxiety (OR:13.98; 95% CI: 9.74, 20.05) and depression (OR=5.70; 95% CI: 4.29, 7.57). The potential mediator (perceived social support) was associated with twice the odds of depression (OR: 2.38, 95% CI: 1.89, 3.00) and anxiety (OR: 2.05; 95% CI: 1.63, 2.58 Table 4). The potential mediator (resilient coping) was associated with over twice the odds of anxiety (OR: 2.44; 95% CI: 1.93, 3.10) and nearly three times the odds of depression (OR: 2.95, 95% CI: 2.32, 3.74; Table 5). However, the models controlling for high perceived social support and high resilient coping failed to support the hypotheses that perceived social support or resilient coping mediated the association between perceived stress and anxiety or depression.

Discussion

Main Findings

Several COVID-19 related studies have examined the relationship between stress and poor mental health (e.g., depression and anxiety). In this study of a university population of students, faculty, and staff, we found that those who reported perceiving higher stress had statistically significant increased odds of reporting severe anxiety and depression symptoms. However, neither perceived social support nor resilient coping mediated the relationship between perceived stress and anxiety symptoms and depression symptoms.

Consistent with this study's findings, some international studies have found that higher perceived stress is associated with higher rates of depression and/or anxiety during the COVID-

19 pandemic. Among university students during the pandemic, perceived stress was significantly associated with depression (Liu et al., 2021) and poor psychosocial health, including anxiety (Yang et al., 2021). Studies conducted during the pandemic also found that in the general population, perceived stress was associated with anxiety symptoms (Xu et al., 2020) and emotional stress – including depression and compulsion-anxiety (Yan et al., 2021).

Several studies have considered perceived social support as a mediator of various exposures (i.e. gender, age stress or perceived stress, resilience,) and mental health outcomes in the general population (Barros & Sacau-Fontenla, 2021; Catabay et al., 2019; Hou et al., 2021; Jianjun et al., 2020; F. Li et al., 2021). Few have considered perceived social support as a mediator of the association between perceived stress and anxiety or depression. (Catabay et al., 2019; Lu et al., 2022; Zhang et al., 2015). An unexpected result in the present study is t that perceived social support did not mediate the relationship between stress and anxiety or depression symptoms (Lund et al., 2018; Perrin et al., 2009). One possible explanation for this is that several previous COVID-19 related studies were conducted in international populations, such as Italy, China, and Spain, where perceptions of stress may differ (González-Sanguino et al., 2020; Li et al., 2020; Mi et al., 2020; Rajkumar, 2020; Rettie & Daniels, 2020; Shi et al., 2020; Sun et al., 2021; Wang, Pan, Wan, Tan, Xu, Ho, et al., 2020; Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020; Xiong et al., 2020). It should also be noted that these international studies were conducted early in the pandemic when perception of stress may have been higher given the uncertainty surrounding the unfolding pandemic. Additionally, it may be that when the survey was conducted, people were feeling socially supported because people were somewhat forced to be together at home (roommates, family-children). The familial unit may have provided social support, but social support could not account for the general anxiety that everyone was feeling,

albeit, while together. Moreover, the MSPSS measures individual perception of sources of social support from family, friends, or significant other. However, there are not only different sources of support but also different types of support. This may include esteem, tangible, information, social network, and emotional support (Ko et al., 2013). This current study does not account for the impact that these different types of social support may provide.

In this study, resilient coping was not found to be a mediator in the relationship between perceived stress and severe anxiety or severe depression. To our knowledge, only a few studies conducted on students during the pandemic have included resilient coping as a mediator (X. Li et al., 2021; Ye et al., 2020). ; Prior studies have failed to consistently find resilient coping as a mediator. Furthermore, previous studies have primarily been conducted outside the U.S. (X. Li et al., 2021; Rahman et al., 2021; Ye et al., 2020) or used a different scale, such as the Connor-Davidson Resilience Scale, to measure resilience rather than the one used in this current study which may explain the discrepancy (X. Li et al., 2021; Ye et al., 2020). One important limitation of the Connor-Davidson Resilience Scale, which rises from the context of its development, is that it is more suited for research occurring in clinical settings which would have been inappropriate for this study which occurred in a non-clinical setting (Davydov et al., 2010).

Some previous COVID-19 related studies (Havnen et al., 2020; Kavčič et al., 2020; Ye et al., 2020; Yıldırım & Solmaz, 2020), have found that resilience does likely buffer the effect of stress on mental health. However, this study does not support this effect. Not everyone who has experienced this pandemic has perceived the same level of stress (or impact). Arguably, even those who have had the same level of perceived stress may not all have the same levels of anxiety or depressive symptoms.

This study supports the hypothesis of the relationship between perceived stress and anxiety and depression symptoms. It did not support the notion that the perceived stress-severe anxiety or severe depression relationship is mediated by resilient coping (e.g., ability to see silver linings or positive outcomes) or perceived social support. This may be partially explained by the stress buffering model in that stress could directly or indirectly increase anxiety symptoms during the pandemic. Regarding perceived social support and resilient coping, it may be that stress directly increased depression or anxiety symptoms rather than indirectly buffered symptoms through resilient coping or perceived social support. It is likely, in this study, that the more individuals perceived stress during this time, the more anxiety or depression symptoms they experienced. However, there may have been other pathways that operated to influence increased anxiety or depression symptoms, such as self-compassion or connectedness, as shown in pre-COVID-19 studies on university students (Luo et al., 2019; Pidgeon et al., 2014). It may also be that a different construct or factors other than resilient coping was more relevant or of greater importance or influence on the perceived stress-severe anxiety or depression relationship in this study population that included university faculty and staff in the context of the COVID-19 pandemic (Melnyk et al., 2021; Peacock, 2022). This adds to the current understanding of the unique kind of stress the pandemic has caused for this population as compared to other stressful experiences or previous disasters (Morganstein, 2021).

Strengths and Limitations

This study has provided important insight into the impact of COVID-19, specifically on how the perception of stress during the early stages of the pandemic affected anxiety and depression in a university population. However, the study did have limitations. Given the cross-sectional nature of the study, causality cannot be established.. Selection bias is also possible as

there was a low participation rate. However, our response rate was similar to a previous study conducted with university populations (Wathelet et al., 2020). Social desirability bias may occur because of the increased likelihood of individuals responding in a socially acceptable or expected way given pervasive stigma associated with mental illness. However, the confidential and anonymous nature of this survey may reduce this likelihood.

Despite these limitations, this study had strengths including use of reliable and validated scales to measure the exposure, outcome, and mediating variables. This study also had a large sample size which is similar to the university population with respect to race/ethnicity and age. It was not similar in regard to gender which may be explained by research that shows females are more likely to respond to online questionnaires (Smith, 2008). This study also fills the gap to provide additional research on an entire university population - faculty, students, and staff. This aids in generalizing results to the other universities located in an urban environment. This study contributes to the literature surrounding the BRCS. Many international studies have used this scale to measure resilience during this pandemic among various other populations such as older adults (Lopez et al., 2020); people living with HIV (Ballivian et al., 2020); those with chronic physical and mental illnesses (Robillard et al., 2020); health care workers (Gandhi et al., 2020; Khalaf et al., 2020; Labrague & De los Santos, 2020; Robillard et al., 2020); parents with children (AL van Tilburg et al., 2020); and the general population (Planchuelo-Gómez et al., 2020; Rahman et al., 2020; Soonthornchaiya, 2020). At this time, this is the first study in the U.S. to investigate the potential mediating effect of resilient coping using the BRCS on a university community that includes students, faculty and staff. While theBRCS scale has been used in a population with only university students (Cosmas, 2020; Fruehwirth et al., 2021) or only teachers (Obrad, 2020), to our knowledge it has not been used in a single population that

includes faculty, staff, and students. This results of this study may suggest that focusing public health efforts towards encouraging and supporting individuals to cope with stress in an adaptive, flexible way despite the stress that this pandemic has created.

Additionally, the timeliness of data collection – within the first year of the pandemic – provides insight into acute stress responses to the pandemic thus allowing for early development of interventions and prevention of worsening or newly-acquired poor mental health. Lastly, it is uncommon for resilient coping and social support to be examined as mediating factors in the relationship between perceived stress and anxiety and depression symptoms. This study adds to the body of knowledge surrounding these relationships.

Implication for Public Health & Future Studies

Despite the increased attention on mental health and psychological impact of COVID-19 on the general population, more studies are needed to assess the association between perceived stress and depression and/or anxiety in the context of this unique population. Additional studies set within diverse U.S. university communities are needed to examine the role of mediating factors such as perceived social support and resilient coping in the association between perceived depression and anxiety, given that these factors are modifiable. These findings may be important because previous research suggests anxiety and depression symptoms may be decreased in times that are perceived as high stress, possibly through the increase of resilient coping. However, since the relationship was not mediated by resilient coping or perceived social support in this study, it may be important for university administration and stakeholders to tailor messages and interventions for those known to be at risk for experiencing higher depression and anxiety symptoms. For instance, studies have found that online social relationships can provide different types of social support, especially during times of distancing (Juvonen et al., 2021; Long et al.,

2022), decreased perception of stress should serve as a desired outcome in the creation of online therapy tools or workshops provided by the university to students, faculty, and staff. Lastly, future studies should conduct longitudinal studies to confirm associations found in this study.

Table 1c: Characteristics of University Community in Psychological Impact Analysis (n=1,351); Study on Psychological Impact of COVID-19 on University Community, 2020-2021

Sociodemographic	N (%)
Gender[26]	
Cisgender Man	358 (26.64)
Cisgender Woman	954 (70.98)
Genderqueer	32 (2.36)
Race	
White	811 (60.03)
Black	153 (11.32)
Other[27]	83 (6.14)
Asian	157 (11.62)
Hispanic/Latinx	119 (8.81)
Missing[28]	28 (2.07)
Age	
18-24	678 (50.19)
25-34	201 (14.88)
35-54	174 (12.88)
55-72	258 (19.10)
Unknown/Missing	40 (2.96)
Marital Status[29]	
Single/Never Married	764 (56.59)
Married/ Living Together/Partner	529 (39.19)
Divorced/Separated/Widowed	57 (4.22)
Employment Status During Pandemic[30]	
Employed[Error! Bookmark not defined.]	934 (69.24)
Unemployed[31]	415 (30.76)
Annual Household Income	
$0- 24,999	370 (27.39)
$25,000-49,999	202 (14.95)
$50,000-74,999	201 (14.88)
$75,000-99,999	156 (11.55)
$100,000+	305 (22.58)
Prefer not to Answer	117 (8.66)
Role at University	
Student	967 (71.58)
Faculty or Staff	384 (24.82)
Relocated outside of Charlotte, NC[32]	
Yes	289 (21.52)
No	1054 (78.48)
Mental Health Diagnoses/Symptoms Before	
Yes	415 (30.72)
No	851 (65.51)
Prefer Not to Answer	51 (3.77)
Self-rated Physical Health During Pandemic[33]	
Excellent/Very Good	400 (29.74)
Good	445 (33.09)
Fair/Poor	500 (37.17)
Biggest Concern or Fear During Pandemic	
Household Concerns [34]	28 (2.08)
Employment	150 (11.14)
Finances	263 (19.52)
Family[35]	234 (17.37)

[26] Number of Missing Participants: 7
[27] Bi/Multi-racial·American Indian/Alaska Native, NHOPI, Other
[28] Prefer not to Answer, Unknown/Missing
[29] Number of Missing Participants: 1
[30] Number of Missing Participants: 2
[31] Student, Retired, Disabled
[32] Number of Missing Participants: 8
[33] Number of Missing Participants: 6
[34] Housing & Groceries/Food
[35] Adult Care, Child Care, Family Wellbeing

Physical Health	188 (13.96)
Mental Health	331 (24.57)
Academics/School	153 (11.36)
Perceived Social Support	
Low/Medium	467 (34.87)
High	884 (65.43)
Resilient Coping	
Low	415 (30.72)
Medium/High	936 (69.28)
Depression Symptoms	
None/Mild	852 (63.06)
Moderate	261 (19.32)
Moderate-Severe	156 (11.55)
Severe	82 (6.07)
Anxiety Symptoms	
None/Mild	850 (62.92)
Moderate	272 (20.13)
Severe	229 (16.95)
Perceived Stress	
Low/Medium	485 (35.90)
High	866 (64.10)

Table 2c. Unadjusted ORs and 95% CIs for the Association between Sociodemographic and Lifestyle Variables and Severe Depression Symptoms, Severe Anxiety Symptoms; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Depression Symptoms		Severe Anxiety Symptoms	
Variables	**OR**	**95% CI**	**OR**	**95% CI**
High Perceived Stress				
Yes	5.70**	4.29 – 7.57	13.98*	9.74 – 20.05
No	1.00	Referent	1.00	Referent
Gender				
Cisgender Man	1.00	Referent	1.00	Referent
Cisgender Woman	2.12*	1.61 – 2.78	2.78*	2.09 – 3.70
Genderqueer	7.96*	3.55 – 17.85	4.28*	2.04 – 8.96
Age				
18 – 24	4.12*	2.90 – 5.86	4.66*	3.25 – 6.68
25 – 34	2.69*	1.75 – 4.12	2.85*	1.84 – 4.41
35 – 54	1.38	0.56 – 2.21	1.54	0.95 – 2.49
55 – 72	1.00	Referent	1.00	Referent
Missing	4.17*	2.07 – 8.38	3.70*	1.82 – 7.50
Marital Status				
Single/Never Married	1.71*	1.35 – 2.16	1.68*	1.33 – 2.12
Married/Living Together/Partner	1.00	Referent	1.00	Referent
Divorced/Widowed/Separated	0.75	0.40 – 1.41	0.54	0.27 – 1.06
Self-Rated Physical Health During Pandemic				
Excellent/Very Good	1.00	Referent	1.00	Referent
Good	2.07*	1.50 – 2.85	2.03*	1.49 – 2.77
Fair/Poor	5.65*	4.15 – 7.69	4.08*	3.03 – 5.49
Experienced Mental Health Symptoms/Diagnosis Before Pandemic				
Yes	3.28*	2.57 – 4.19	4.04*	3.16 – 5.17
No	1.00	Referent	1.00	Referent
Prefer Not to Answer	2.75*	1.56 – 4.85	2.94*	1.67 – 5.20
Perceived Loneliness				
Not/Least Lonely	1.00	Referent	1.00	Referent
Moderately Lonely	4.75*	3.02 – 7.47	5.88*	3.65 – 9.47
Most Lonely	14.80*	9.37 – 23.39	16.54*	10.22 – 26.77
Income				
$0 – 24,999	1.00	Referent	1.00	Referent
$25,000 – 49,999	0.79	0.56 – 1.12	0.81	0.57 – 1.14
$50,000 – 74,999	0.49	0.34 – 0.70	0.61	0.43 – 0.88
$75,000 – 99,999	0.48*	0.32 – 0.71	0.53	0.36 – 0.79
≥$100,000	0.47*	0.34 – 0.65	0.53	0.39 – 0.73
Prefer Not to Answer	0.79	0.52 – 1.21	0.89	0.58 – 1.35
Race/Ethnicity				
Non-Hispanic White	1.00	Referent	1.00	Referent
Non-Hispanic Black	0.81	0.56 – 1.18	0.76	0.52 - 1.09
Other (AIAN, Asian, NHOPI, Bi/Multiracial)	1.50	0.95 – 2.37	0.86	0.54 - 1.39
Asian	1.01	0.71 – 1.45	0.84	0.59 - 1.21
Prefer Not to Answer	1.33	0.90 – 1.97	1.05	0.71 - 1.56
Hispanic/Latinx	1.54	0.72 – 3.28	1.04	0.48 - 2.25
Relocate				
Yes	1.89*	1.45 – 2.46	2.22*	1.70 – 2.89
No	1.00	Referent	1.00	Referent
Role at University				
Student	2.85*	2.16 – 3.75	2.82*	2.14 – 3.71
Faculty & Staff	1.00	Referent	1.00	Referent
Employment Status During Pandemic				
Employed	1.00	Referent	1.00	Referent
Unemployed	1.43*	1.32 – 1.82	1.25	0.98 – 1.58

Perceived Social Support				
Low/Medium	2.38*	1.89 – 3.00	2.05*	1.63 – 2.58
High	1.00	Referent	1.00	Referent
Resilient Coping				
Low	2.95*	2.32 – 3.74	2.44*	1.93 – 3.10
Medium/High	1.00	Referent	1.00	Referent

Table 3c. Adjusted ORs and 95% CIs for the Association between High Perceived Stress and Severe Depression Symptoms, Severe Anxiety Symptoms; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

	Severe Depression Symptoms†		Severe Anxiety Symptoms‡	
	OR	**95% CI**	**OR**	**95% CI**
High Perceived Stress				
Yes	3.69*	2.65 – 5.14	11.10*	7.39 – 16.67
No	1.00	Referent	1.00	Referent

Abbreviations: CI, confidence interval; OR, odds ratio.

† Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, race/ethnicity, and level of resilient coping.

‡ Adjusted for gender, age, self-rated physical health during the pandemic, experienced mental health symptoms/diagnosis before pandemic, perceived loneliness, and level of resilient coping.

*p-value: ≤0.05

Table 4c. Degree to which Perceived Social Support Mediates Association between High Perceived Stress and Anxiety and Depression; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

Logistic Regression	Outcomes	
	Severe Depression Symptoms OR (95% CI)	*Severe Anxiety Symptoms OR (95% CI)*
High Perceived Stress predicting Outcome	5.70 (4.29 – 7.57)	13.98 (9.74 – 20.05)
High Perceived Stress predicting Perceived Social Support	0.78 (0.61 – 0.98)	0.78 (0.61 – 0.98)
Perceived Social Support predicting Outcome	2.38 (1.89 – 3.00)	2.05 (1.63 – 2.58)
High Perceived Stress predicting Outcome, controlling Perceived Social Support	5.78 (4.32 – 7.72)	14.26 (9.90 – 20.53)

Table 5c. Degree to which Resilient Coping Mediates Association between Resilient Coping and Anxiety and Depression; Study on Psychological Impact of COVID-19 on University Community, 2020-2021

Logistic Regression	Outcomes	
	Severe Depression Symptoms OR (95% CI)	*Severe Anxiety Symptoms OR (95% CI)*
High Perceived Stress predicting Outcome	5.70 (4.29 – 7.57)	13.98 (9.74 – 20.05)
High Perceived Stress predicting Resilient Coping	0.62 (0.48 – 0.79)	0.62 (0.48 – 0.79)
Resilient Coping predicting Outcome	2.95 (2.32 – 3.74)	2.44 (1.93 – 3.10)
High Perceived Stress predicting Outcome, controlling Resilient Coping	5.56 (4.16 – 7.44)	13.79 (9.58 – 19.86)

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CHAPTER 5: DISCUSSION

Given the turmoil that has occurred over the past 2.5 years because of the COVID-19 pandemic, it is highly unlikely that individuals and communities will survive the pandemic without any psychological impact. Instead, psychiatric providers are bracing for and treating a high number of new onset or exacerbated mental health symptomology or conditions (Charlton, 2020; Ianzito, 2022; Parker-Pope et al., 2021). The worldwide prevalence of anxiety, mental and depression during the pandemic was found to be 26.9%, 50.0%, 28.0%, respectively (Nochaiwong et al., 2021). The longer the duration of the COVID-19 pandemic and the disruptions to daily life, the higher the likelihood of poor mental health (Rudenstine et al., 2021). At this time, there is a need for research on the mental health impact of COVID-19 on an entire university population – including faculty, students, and staff – in the United States (U.S.). Several COVID-19 related studies have been conducted with a student population (Cao et al., 2020; Du et al., 2020; Gandhi et al., 2020; González-Sanguino et al., 2020; Limcaoco et al., 2020; Odriozola-González et al., 2020; Sahu, 2020; Sartorao Filho et al., 2020; Ye et al., 2020; Zhai & Du, 2020), but few have including faculty and staff (Melnyk et al., 2021; Peacock, 2022). In particular, U.S. studies that include student as well as faculty and staff are lacking. Moreover, when studies have been conducted on faulty and staff, it has been examined in the context of transitions to online teaching and remote learning and not often in the context of their overall mental health (Daniel, 2020; Johnson et al., 2020). Collectively, this dissertation addresses these gaps by presenting an understanding of the psychological impact of COVID-19 on a university community.

Review of Major Findings

The overall purpose of the dissertation was to understand "what impact has COVID-19 had on the psychological wellbeing of faculty, staff, and students at a public American research university?" To understand the impact, this dissertation research was conducted at a 4-year public research university including all faculty, staff, and students who were working or enrolled at the time of the study (December 2020 to January 2021). This major study included three primary aims: (1) to examine which sociodemographic factors are related to poor mental health outcomes among a university community; (2) to evaluate the association between physical distancing and severe depression, severe anxiety, and high perceived stress; and, to determine if past community trauma or perceived social support modify the associations; and (3) to evaluate the association between perceived stress and depression and anxiety symptoms – with resilient coping and social support as potential mediators of this relationship in a large university community, including faculty, students, and staff.

In the first study, the following sociodemographic factors were found to be associated with statistically significant increased odds of experiencing symptoms of depression, anxiety, and stress in a university community: gender, age, self-rated mental health, prior mental health diagnosis/symptoms, perceived degree of coping, and loneliness.

In the second study, it was hypothesized that those who reported engaging in physical distancing would have increased odds of poor mental health outcomes and that experiencing past community trauma and perceiving social support would modify the association between physical distancing and poor mental health outcomes. In this university population, the results failed to support the hypothesis that physical distancing was associated with increased odds of poor mental health outcomes. Those who did not engage in physical distancing had increased odds of

severe anxiety symptoms and severe depression symptoms. Physical distancing was not associated with perceiving higher stress. The study did find the relationship is modified by past community trauma, but not by perceived social support.

In the third and final study, it was hypothesized that those who reported perceiving higher stress would have increased odds of reporting anxiety and depression symptoms, and that resilient coping and social support not only directly affect anxiety and depression symptoms, but also partially mediate the relationship between perceived stress and anxiety symptoms and depression symptoms. The study found that those who reported perceiving higher stress had increased odds of reporting severe anxiety and depression symptoms. However, neither perceived social support nor resilient coping mediated the relationship between perceived stress and anxiety symptoms and depression symptoms.

At the time of the study, during the first year of the pandemic, much of the study population reported experiencing none to mild depression (63.1%) and none to mild anxiety (65.0%) symptoms but perceived high stress (64.0%). Although not all findings were statistically significant, these studies consistently highlighted that COVID-19 has had substantial psychological impacts on the mental health of university faculty, staff, and students including increased depression, anxiety, perceived stress, and loneliness. This research contributes to the scientific knowledge regarding which groups are most vulnerable or at higher risk of experiencing poor mental health in this population in the context of this pandemic. There seems to be evidence of an increased likelihood of poor mental health outcomes among cisgender women, those with prior mental health symptoms/diagnoses, those who perceive themselves to be most lonely or to have poor/fair mental health, those who did not engage in physical distancing, and those with exposure to past community trauma. Collectively, this study presents

an understanding of the significant psychological impact that the COVID-19 pandemic has had on this university community at the time it was conducted. It suggests that this population requires collaboration between the community and the administration to provide greater attention and support in the form of high quality and timely services and preventive measures to minimize the possibility of poor mental health outcomes, particularly in those higher risk groups, now and in the future.

Overall Novelty

This study offers significant contributions to the field of disaster mental health and public health including: (1) to the best of our knowledge, this study is the first to focus on depression, anxiety, and perceived stress among an entire university community in the Southeast U.S. within the context of the ongoing COVID-19 pandemic; and (2) at this time, this is the first study in the U.S. to investigate the potential mediating effect of resilient coping using the Brief Resilient Coping Scale (BRCS) in a university population. Many studies conducted outside the U.S. studies have used the BRCS scale to measure resilience during this pandemic among various populations, but not on an entire university community.

Public Health Implications

As so clearly experienced during the last two years of this pandemic, mental health is public health, particularly during times of crisis (Brülhart et al., 2021). The COVID-19 pandemic differed as it is an ongoing disaster and initial public health measures to reduce the transmission included ways that reduced typical means of connecting such as physical distancing and encouraging individuals to isolate via lockdown orders.

As stated in the introduction, the field of public health needs to rapidly respond to the specific, real, and anticipated mental health needs of this unique and vulnerable population. This

study provides a primary understanding of the perceptions and the psychological and social experiences of this university community. It also creates attention for the mental health impact the pandemic will have on university communities for years to come. It also serves as a demonstration of the need for short- and long-term interventions to be tailored to this vulnerable population that can be evaluated and assessed (Chan et al., 2009). These findings demonstrate that rigorous research is needed to explore (1) why particular groups (i.e. cisgender women, those of younger age, those with poor self-rated mental health, prior mental health diagnosis/symptoms, lower perceived degree of coping, and increased loneliness) are more vulnerable to experiencing negative psychological outcomes such as anxiety, depression, and perceived stress; (2) the types of social support that would be most benefit to those who were not engaging in physical distancing and those who have experienced past community trauma in this population and in the context of this pandemic, and (3) how various mediating factors such as perceived social support and resilient coping affect the perceived stress-severe anxiety and depression associations given that these factors are potentially modifiable.

Strengths and Limitations

The limitation of each study/analysis is included in each individual chapter, but the overall limitations include the following. Cross-sectional post disaster study designs are the most commonly used study design in disaster mental health research (Goldmann & Galea, 2014). Cross-sectional designs prevent the declaration of clear associations between the exposure and the outcome due to temporality bias. This potentially limits the identification of factors associated with the courses of mental illness and which specific and tailored interventions are needed (Goldmann & Galea, 2014). It should be noted that questions used in the dissertation research were worded in such a way as to attempt to maintain temporal sequence. Additionally,

comparison between similar studies is challenging due to the differences in measurement scales used to measure the exposure or the mental health outcome. The timing of deployment of a survey during the 24 months of this SARS-CoV-2 pandemic may also impact the extent of symptoms reported or willingness to maintain mitigation measures, such as physical distancing. Over time, some inconsistency in results with similar studies conducted in an earlier or later time frame of the pandemic would be expected, as the context of employment, closures, vaccination, and mitigation mandates have changed over the pandemic.

Inferences are limited to the time at which data are collected and does not allow for generalization to future time points or assessment of temporal relationships particularly because the exposure (COVID-19) has occurred at the same time as the outcome (psychological impact (Sullivan, 2008). Exclusion of some hard-to-reach groups (i.e. those without reliable internet access and those who are not computer proficient) may have influenced the representativeness of the study findings and may have resulted in underestimation of the COVID-19's impact on the university community's mental health. Lastly, selection bias was also possible with the exclusion of incoming or new Fall 2020 students, faculty, and staff. However, these individuals were excluded since the Stay at Home Order was effective beginning March 10, 2020 and study participants needed to be a part of the university community that was impacted by those orders at the time. Social desirability bias may also have occurred due to the increased likelihood of individuals responding in a socially acceptable or expected way. This is very likely given the sensitive nature of the questions and the pervasive stigma associated with mental illness.

This study also has several strengths. As aforementioned, this is the first study in the scientific literature exploring the psychological impact of COVID-19, including the use of the BRCS, in a sample of university students, faculty, and staff in a U.S. population. Only one

international study has examined mental health among an entire university community (Al Miskry et al., 2021). The study population used in this research is unique – this university community that has experienced a considerable amount of community trauma in a short period of time with the 2016 shooting of Keith Lamont Scott and the violence that ensued quickly afterwards, the 2019 campus shooting, and now the 2020 COVID-19 pandemic . Moreover, this study was conducted during an unprecedented time. The mental health of university students, and in particular graduate students, has been studied in the recent past (Barros & Sacau-Fontenla, 2021; Browning et al., 2021; Cao et al., 2020; Fruehwirth et al., 2021; Guo et al., 2020; Kecojevic et al., 2020; Lu et al., 2022; Olson et al., 2021; Pidgeon et al., 2014; Rahiem, 2021; Rudenstine et al., 2021; Son et al., 2020; Sun et al., 2021; Sundarasen et al., 2020; Wathelet et al., 2020; Yang et al., 2021; Zapata-Ospina et al., 2021; Zhai & Du, 2020). However, faculty and staff mental health are rarely studied. The majority of studies conducted in the post disaster phase examine PTSD. This study attempts to address the need for studies that focus on anxiety disorders and reactions, such as generalized anxiety disorder (GAD). Regarding analysis, the large sample size allowed for robust analysis and associations to be made which may allow these findings to be generalizable to other university populations in the U.S, particularly those in urban locations.

This study also provides valuable information about the current pandemic and allows other university communities to draw similar insights. It serves to understand the association between physical distancing and mental health outcomes in this population. The sense of community is important to the university experience for many. This is especially so when a university experiences a trauma (e.g. school shooting). It also highlights the need for interventions aimed at this population and interventions meant to reduce poor mental health

outcomes, especially those related to necessary or inevitable public health interventions (e.g. isolation, physical distancing).

It should be noted that during data collection, several additional stressors that may have contributed to perceived stress, anxiety, or depression symptoms were ongoing in the country. This includes the 2020 presidential and local elections, the increased media attention to social unrest including the police killings of unarmed people of color and ongoing racial discrimination, as well as the January 6th attack on the U.S. capitol. While it is not possible for this study to make conclusions based on these events, the results of this study do highlight the potential adverse mental health outcomes of concurrent disasters or traumas occurring during this pandemic. From this study, researchers and public health professionals will be able to increase vigilance of poor mental health outcomes and to design and implement strategies which reduce the likelihood of poor mental health outcomes following disasters, especially among university students, faculty, and staff.

Future Research

This current climate has shed light on both the importance of and the underfunded and neglected public health in this country and around the world. Additionally, this pandemic's impact on mental health requires an understanding to have better dissemination of tools to help individuals to cope and to know when, how, and where they need to seek additional help. The results of this study provide a foundation for future studies to use a longitudinal study design to understand the long-term psychological impacts of this pandemic on the mental health of university faculty, staff, and students.

Another direction for future research is to use the quantitative findings as a foundation to explore the lived experiences of university faculty, staff and students by way of a qualitative

study. Although the third manuscript did not find resilient coping to be a mediating factor in the perceived stress-severe anxiety or depression relationship, it should be noted that the majority of the university population experienced none/mild depression (63.1%) or none/mild anxiety (62.3%) and in fact, more than two-thirds of the study population reported high resilient coping (64.1%). Future studies should explore the association between coping strategies and mental health outcomes using both quantitative and qualitative approaches to explore the role of particular coping strategies and mental health outcomes during this pandemic. Additional studies should also identify specific coping strategies that promote resilience and prevent worsening mental health as a result of the experiences from this pandemic.

Current studies conducted outside the U.S. have examined this association during the pandemic among the general population, but not among an entire university population including faculty, students, and staff (Guo et al., 2020; Gurvich et al., 2021; Muñoz-Violant et al., 2021; Sampogna et al., 2021). As aforementioned, the literature lacks studies focused on the mental health of faculty and staff. Additional research is needed that includes or focuses on the mental health of faculty and staff as they, too, face similar increases in stress and risk for poor mental health outcomes and serious long term impacts to their mental health as a result of this pandemic (Peacock, 2022). This is especially so as they are at increased risk for burnout given increased work demands, increased demands at home, and potentially lower availability of resources which may have been primarily targeted towards students.

Lastly, a university community has stressors and challenges, even traumas, that will increase their community's susceptibility of experiencing the psychological impact of COVID-19 differently. Future studies should examine community resilience as an alternative to traditional approaches to disaster recovery and response as it requires and encourages

participation from the entire community to prepare, withstand, and recover (Towe et al., 2015). Logically, it would be important to bolster a community's resilience before the next disaster occurs so the odds of reducing mental health impacts throughout the community are significantly reduced. Moreover, future studies should examine the impact of different types of social support, so that interventions can empower individuals to rely more on the social capital that already exists to reduce potential or existing psychological impairment from the disaster.

Conclusion

The mental health impacts of the coronavirus 2019 disease and the economic, environmental, and social effects will likely beyond the end of the pandemic as the world adjusts to a new normal. It should be noted that the psychological impacts may likely occur even if the individual never contracts COVID-19 or experiences the related symptoms due to the multidimensional stressors that this pandemic has created in daily life. The insights gained from this research may inform public health practice, approach, interventions, and research which will address the specific real and anticipated needs of this unique population, such as multidisciplinary programs specific to mental health and internet-based interventions available during and post pandemic (Bonardi et al., 2021; Zapata-Ospina et al., 2021). The creation and implementation of multidisciplinary programs and internet-based interventions is especially needed as university communities are experiencing strains and uncertainty. These strains may include past trauma, lack of social connectedness, grief, and increased need with limited resources and funding. Unlike any epidemic before, these changes in daily life have created significant negative social and psychological effects in a short amount of time in a large number of people. Its impact on mental health requires an understanding so as to have a better dissemination of tools to help individuals to cope and to determine when, how, and where they need to seek additional help.

Subsequent interventions tailored as a result of this dissertation may continue to involve use of social media and other technologies as a platform to check in with the university community and provide regular contact, to encourage individuals to connect and seek out trusted mental health resources and support, and to allow sharing of information about one's own wellbeing and resources or support they may need. For nearly over a year, the world was asked to be physically distant, not socially or emotionally distant. The use of technology can be used widely to both understand the mental health impact of COVID-19 and to remain emotionally connected to individuals. It is in these times that social interaction and social support are paramount, and perhaps even more necessary. Given the uniqueness of this uncertain time and threat to our mental health, this study helps to prepare this campus and other campuses around the country to recognize that in the current climate and immediate aftermath, mental and behavioral illnesses will increase in prevalence, and we need to be prepared. Now more than ever, it is important to bolster mental health systems on university campuses as the occurrence of negative mental health outcomes is inevitable. However, with emerging data such as that which is provided by this dissertation, the field of public health has the ability to respond quickly and effectively to the increasing mental health needs that exist now.

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APPENDIX A: QUESTIONNAIRE

Survey

Consent and Screening

Dear Member of the UNC Charlotte Community,

Researchers in the Department of Public Health Sciences are conducting a study on the impact of COVID-19 on mental health and coping on this university community. If you are a current UNC Charlotte student, faculty, or staff in any department on campus with an active @uncc.edu email, were enrolled or working prior to Spring 2020 semester (on or before Jan 8th, 2020); and are 18 years or older, you are eligible to complete this online survey. The survey requires approximately 20 minutes to complete via computer or smartphone.

You will need to complete the survey in **ONE** session.

There are no direct benefits to you for taking the survey. Some questions may ask about sensitive topics such as experiences with past community trauma near or on campus, mental health, and coping skills, including questions that provide a response option to indicate if you have used substances to cope, for example. You can select the "prefer not to answer" choice for any question. Findings may be used to help inform university student health services on college campuses and be useful for the design of future health intervention/prevention programs on college campuses.

After the study is complete, study data may be shared with other researchers for use in other studies or as may be needed as part of publishing our results. The data we share will not include information that could identify you.

After completing the survey, you can be entered into a drawing to win one of ten $50 Amazon gift cards. For participants who wish to be entered into the drawing for the gift card, email addresses will be collected separately. We will not be able to tie your email addresses to the survey responses.

Gift card winners will be notified by email once the survey is closed.

In order to join the gift card drawing, you will need to complete the entire survey all the way to the end. You have the option to select "prefer not to answer" for any question that

is uncomfortable to answer.

Incentive payments are considered taxable income. Therefore, we are required to give the University's Financial Services division a log/tracking sheet with the names of the 10 individuals who will receive a gift card. This sheet is for tax purposes only and is separate from the research data, which means the names will not be linked to survey responses.

Your participation is entirely voluntary. Your responses are confidential. You can withdraw from the study at any time or refuse to answer particular questions.

This study has been approved by the UNC Charlotte IRB (uncc-irb@uncc.edu; protocol #21-0137).

If you have any questions or concerns, please contact Faustina Bello-Ogunu (fbelloog@uncc.edu) or Dr. Larissa Brunner Huber (lrhuber@uncc.edu).

If you have further questions or concerns about your rights as a participant in this study, contact the Office of Research Protections and Integrity at (704) 687-1871 or uncc-irb@uncc.edu.

Disclaimer: Please note, the scales and scores used in this study do not reflect any particular diagnosis or course of treatment. They are meant as a tool to help assess your emotional and mental well-being. If you have any further concerns about your current well-being; if you are feeling upset, disturbed; or if taking part in this survey has brought up uncomfortable feelings, please contact the following based on your university role:

1. **Students**: the UNCC Center for Counseling and Psychological Services (CAPS) https://caps.uncc.edu/ or call CAPS at 704-687-0311. CAPS provides individual, couples, and group counseling services, consultation, outreach, and psychiatric services to support UNC Charlotte students in addressing personal, relationship, developmental, academic, or other concerns.
2. **Faculty/Staff**: CompPsych via the Employee Assistance Program (EAP) https://hr.uncc.edu/employee-relations/compsych-guidance-resources-employee-assistance-program or call 1- 877-603-8259. ComPsych provides confidential counseling, work-life solutions, financial information and resources, legal support and

resources, COVID-19 specific resources, and mental health resources to support UNCC faculty and staff.

You may print this screen for your personal records. You may also download a copy of the informed consent form as a "downloadable link" below.

IRB Protocol #21-0137 Informed Consent

If you are 18 years of age or older, have read and understand the information provided and freely consent to participate in the study, you may proceed to the survey.

Are you 18 years of age or older?

- ○ Yes
- ○ No

Were you enrolled as a student or working as faculty or staff prior to the Spring 2020 semester (on or before on Jan 8th, 2020)?

- ○ Yes
- ○ No

Demographics

What best describes your gender?

- ○ Male
- ○ Female
- ○ Trans femme/woman
- ○ Trans masculine/man
- ○ Genderqueer (gender non-binary, gender fluid, agender)
- ○ Prefer not to answer
- ○ [ ] Other (Please specify)

Which best describes your sexual identity?

- ○ Heterosexual
- ○ Bisexual or pansexual
- ○ Gay
- ○ Lesbian
- ○ Queer
- ○ Questioning/Not Sure
- ○ Other (Please Specify)
- ○ Prefer not to answer

What is your age?

Age in Years ☐

Choose one or more races that you consider yourself to be:

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Biracial/Multiracial
- ☐ Prefer not to answer
- ☐ Other ☐

Are you Spanish, Hispanic, or Latino or none of these?

- ○ Yes, I identify as Spanish, Hispanic, or Latino.
- ○ None of these
- ○ Prefer not to answer

What language do you **primarily** speak in the home?

- ○ Speak only English at home
- ○ Spanish
- ○ Hindi, Gujarati, or Urdu
- ○ Japanese

- ○ Korean
- ○ Vietnamese
- ○ Chinese (incl. Cantonese, Mandarin, other Chinese languages)
- ○ [ ] Other, please specify:

What is your current relationship status?

- ○ Single/Never Married
- ○ Married
- ○ Living Together/Partner
- ○ Divorced
- ○ Separated
- ○ Widowed

Information about income is very important to understand the impact of finances on emotional and mental wellbeing. Would you please give your best guess? Please indicate the answer that includes your entire household income in **2019** (the previous year) before taxes.

- ○ $0
- ○ $1 to $9,999
- ○ $10,000 to $24,999
- ○ $25,000 to 49,999
- ○ $50,000 to 74,999
- ○ $75,000 to 99,999
- ○ $100,000 to 149,999
- ○ $150, 000 and greater
- ○ Prefer not to answer

Identify your **primary** role at the University.

- ○ Student
- ○ Faculty
- ○ Staff

What year of study are you in?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ Postgraduate Certificate
- ○ Masters
- ○ Doctorate
- ○ Prefer not to answer

Are you the first in your family to attend a 4-year college?

- ○ Yes
- ○ No

Are you the first in your family to attend graduate school?

- ○ Yes
- ○ No

Are you an international student?

- ○ Yes
- ○ No

Which of these apply to you?

- ○ have no student debt $0
- ○ have current student debt $1-$20,000
- ○ have current student debt $20,000+

Were you a distance education student **on or before January 8th, 2020** - the beginning of Spring 2020 semester?

- ○ Yes
- ○ No
- ○ Don't Know

If you are faculty, what is your position?

- ○ Pre-tenure/Tenure Track
- ○ Tenured
- ○ Lecturer
- ○ I am NOT faculty/Not Applicable
- ○ [ ] Other, specify

If you are staff, what is your position?

- ○ Administrative/ Managerial
- ○ Environmental
- ○ Information Technology
- ○ Institutional Services
- ○ Law Enforcement and Public Safety
- ○ Medical and Health
- ○ I am NOT staff/ Not Applicable
- ○ [ ] Other (Please Specify)

UNCC & Past Charlotte Events

Were you a student, faculty (professor, lecturer, adjunct), or staff during any of the following semesters? S*elect all that apply.*

- ☐ Fall 2016
- ☐ Spring 2019
- ☐ Neither of these apply to me.

Did the following **impact your emotional well-being or mental health**: the shooting of Keith Lamont Scott by local law enforcement, which occurred about a mile from UNC

Charlotte's main campus in College Downs in September 2016?

- ○ Yes, my emotional well-being or mental health was impacted.
- ○ No, my emotional well-being or mental health was NOT impacted.

Did the protests that happened right near the campus cause you emotional distress?

- ○ _____ Yes; If so, please describe.
- ○ No, the protests did not cause emotional distress.

What coping skills did you use after the event? *Select all that apply.*

- ☐ Meditation or Prayer
- ☐ Journaling
- ☐ Positive thinking
- ☐ Forgiveness
- ☐ Reframing
- ☐ Talking to trusted individual (i.e. family member, friend, colleague, peer, spiritual leader, etc).
- ☐ Talking to a trained therapist or counselor
- ☐ Exercise (i.e. yoga, hiking, gym, pick up sports, etc.)
- ☐ Pet therapy
- ☐ Substances (i.e. marijuana, alcohol, vaping, etc.)
- ☐ Avoiding things that remind you of the event
- ☐ Self-care
- ☐ Breathing exercises
- ☐ I did not use any coping skills.
- ☐ _____ Other, please specify

Did any of the coping skills work for you?

- ○ Yes
- ○ No
- ○ Don't Know

Do you continue to use them to help with any emotional distress or mental health challenges you may be experiencing during COVID-19?

- ○ Yes
- ○ No
- ○ Don't Know

Were you present on campus when the campus shooting took place on April 30th, 2019?

- ○ Yes
- ○ No

Did the event impact your emotional well being or mental health?

- ○ Yes
- ○ No
- ○ Don't Know

What coping skills did you use after the event? *Select all that apply.*

- ☐ Meditation or Prayer
- ☐ Journaling
- ☐ Positive thinking
- ☐ Forgiveness
- ☐ Reframing
- ☐ Talking to trusted individual (i.e. family member, friend, colleague, peer, spiritual leader, etc).
- ☐ Talking to a trained therapist or counselor
- ☐ Exercise (i.e. yoga, hiking, gym, pick up sports, etc.)
- ☐ Pet therapy
- ☐ Substances (i.e. marijuana, alcohol, vaping, etc.)
- ☐ Avoiding things that remind you of the event
- ☐ Self-care
- ☐ Breathing exercises
- ☐ I did not use any coping skills.

☐ [ ] Other, please specify

Did any of the coping skills work for you?

○ Yes
○ No
○ Don't Know

Do you continue to use them to help with any emotional distress or mental health challenges you may be experiencing during COVID-19?

○ Yes
○ No
○ Don't Know

COVID-19 & Housing

Prior to COVID-19, what was your living situation? *Select all that apply.*

☐ Alone
☐ With Intimate partner/spouse
☐ With Friend/Roommate
☐ With Family
☐ In a rented house, mobile home, or apartment
☐ In an owned home, or mobile home
☐ In a dorm
☐ In a location other than your home, mobile home, apartment such as temporary situation, couch surfing, group home, treatment center, etc.

Who lived with you **before** COVID-19 (before March 10, 2020 when Governor Cooper issued Stay at Home Order)? *Select all that apply.*

☐ Spouse/ Intimate Partner
☐ Parent
☐ Sibling

- [ ] Child
- [ ] _____ Another family member, please specify:
- [ ] Roommate
- [ ] Friend
- [ ] Cannot really say how the person is connected
- [ ] _____ Other, please specify:

Did you relocate or move because of COVID-19?

- ○ Yes.
- ○ No, I stayed in the Charlotte, NC area.

Please indicate the city you relocated to.

_____

Please indicate the state you relocated to.

State/Territory _____

Currently, what is your living situation? Please select all that apply?

- [ ] My living situation has not changed since COVID-19 began.
- [ ] Alone
- [ ] With Intimate Partner/ Spouse
- [ ] With Friend/Roommate
- [ ] With Family
- [ ] In a rented house, mobile home, or apartment
- [ ] In an owned home, or mobile home
- [ ] In a dorm
- [ ] In a location other than your home, mobile home, apartment such as temporary situation, couch surfing, group home, treatment center, etc.

Who lived with you **since** COVID-19 (on or after March 10, 2020 when Governor Cooper issued Stay at Home Order)? Please select all that apply.

- [ ] Spouse/ Intimate Partner
- [ ] Parent
- [ ] Sibling
- [ ] Child
- [ ] _____ Another family member, please specify:
- [ ] Neighbor
- [ ] Roommate
- [ ] Friend
- [ ] Cannot really say how the person is connected
- [ ] _____ Other, please specify:

Do you have any children (ages 0-17) living in the home with you?

- ○ Yes
- ○ No

Have they used Zoom, YouTube, WebEx, or any online platform to continue schooling at home?

- ○ Yes
- ○ No

Have you had to help them while also managing work or school of your own?

- ○ Yes
- ○ No

COVID-19 & Employment

Prior to COVID-19, what was your employment situation? Please select all that apply.

- [ ] Employed full-time (40 or more hours per week)
- [ ] Employed part-time (up to 39 hours per week)
- [ ] Unemployed and currently looking for work
- [ ] Unemployed and not currently looking for work

- [ ] Student
- [ ] Retired
- [ ] Care for family/children
- [ ] Self-employed
- [ ] Unable to work/disabled

If employed, were you considered an **essential** worker?

- ○ Yes
- ○ No

Currently, what is your employment situation? *Select all that apply.*

- [ ] My employment situation has not changed since COVID-19 has started.
- [ ] Employed full-time (40 or more hours per week)
- [ ] Employed part-time (up to 39 hours per week)
- [ ] Unemployed and currently looking for work
- [ ] Unemployed and not currently looking for work
- [ ] Student
- [ ] Retired
- [ ] Care for family/children
- [ ] Self-employed
- [ ] Unable to work/disabled

If employed, are you considered an **essential** worker?

- ○ Yes
- ○ No

COVID-19 & Health

In general, how would you rate your overall PHYSICAL health **before** COVID-19?

- ○ Excellent
- ○ Very Good

- ○ Good
- ○ Fair
- ○ Poor
- ○ Don't Know/Not Sure

In general, how would you rate your overall MENTAL health (includes emotional, psychological, and social well-being) **before** COVID-19?

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor
- ○ Don't Know/Not Sure

In general, how would you rate your overall PHYSICAL health **during** COVID-19?

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor
- ○ Don't Know/Not Sure

In general, how would you rate your overall MENTAL health (includes emotional, psychological, and social well-being) **during** COVID-19?

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor
- ○ Don't Know/Not Sure

Now thinking about your mental health, which includes stress, depression, and problems with emotions, for **how many days during the past 30 days** was your mental health **NOT** good?

Number of Days ☐

During the past 30 days, for about **how many days** have you felt **SAD**, **BLUE**, or **DEPRESSED**?

Number of Days ☐

During the past 30 days, for about **how many days** have you felt **WORRIED**, **TENSE**, or **ANXIOUS**?

Number of Days ☐

During the past 30 days, for about **how many days** have you felt you did **NOT** get **ENOUGH REST** or **SLEEP**?

Number of Days ☐

During the past 30 days, for about **how many days** have you felt **VERY HEALTHY AND FULL OF ENERGY**?

Number of Day ☐

Do you have an existing mental health diagnosis/symptom before COVID-19?

- ○ ☐ Yes, specify:
- ○ No
- ○ Prefer not to answer.

When a vaccine is approved, do you plan on getting a COVID-19 vaccine?

- ○ Yes
- ○ No
- ○ Undecided

What was the result of your most recent test for COVID-19?

- ○ I have not been tested for COVID-19.
- ○ I have been tested and the results were POSITIVE.
- ○ I have been tested and the results were NEGATIVE.

COVID-19 & Stay at Home

For the purposes of this study, ***physical distancing*** *(also referred to social distancing) is* ***"keeping a safe space between yourself and other people who are not from your household" when in public by keeping 6 feet, or 2 meters, from others.***

Do you believe that physical distancing (also referred to as social distancing) is beneficial to protect you from COVID-19 infection?

- ○ Yes
- ○ No
- ○ Don't Know

Do you believe that physical distancing (also referred to as social distancing) is beneficial to protect others from COVID-19 infection?

- ○ Yes
- ○ No
- ○ Don't Know

If you did leave your home during the Stay at Home Order (March 30th to May 22nd), where did you go?

- ☐ Church
- ☐ School
- ☐ Work
- ☐ Grocery Store
- ☐ General shopping
- ☐ I did not leave my home during the Stay at Home Order.

How frequently did you go out?

- ○ Every day
- ○ Multiple times in one week
- ○ Once per week
- ○ Every 2-3 weeks
- ○ Once per month

Since Phase 2 began (May 22, 2020), have you gone out (for work, school, groceries, church, etc.)?

- ○ Yes
- ○ No

Where have you gone since Phase 2 began (on May 22, 2020)?

- ☐ Church
- ☐ School
- ☐ Work
- ☐ Grocery Store
- ☐ General shopping

How frequently have you gone out since Phase 2 began (on May 22, 2020)?

- ○ Every day
- ○ Multiple times in one week
- ○ Once per week
- ○ Every 2-3 weeks
- ○ Once per month

Have you maintained social distancing (also referred to as physical distancing) during this pandemic?

- ○ Yes
- ○ No

How have you physically distanced (also referred to as socially distancing)? *Select all that apply.*

- ☐ Avoidance
- ☐ Limiting interactions or touching
- ☐ Wearing a face mask when going out
- ☐ Limiting Outings
- ☐ _____ Other, please specify:

What actions have you taken to socially distance from others? *Select all that apply.*

- ☐ Work from home
- ☐ Avoid dining out
- ☐ Leaving distance when you go out
- ☐ Limit/avoid seeing friends or family
- ☐ Limit/avoid physical contact with friend or family

Is it difficult for you to socially distance?

- ○ Yes
- ○ No
- ○ Don't Know

COVID-19 & Coping

Thinking about life since COVID-19 has occurred, what is the **biggest concern or fear** during this time? *Please select **ONE**.*

- ○ Housing
- ○ Employment
- ○ Finances
- ○ Childcare
- ○ Adult care
- ○ Physical health
- ○ Mental health

- ○ Groceries/food
- ○ Family
- ○ Academics/school

Do you believe that you were mentally prepared to cope with COVID-19 and the impact it has had on your life?

- ○ Yes
- ○ No
- ○ Don't Know

How well would you say that you are coping with the impact COVID-19 has had on your life?

- ○ Extremely well
- ○ Very well
- ○ Moderately well
- ○ Slightly well
- ○ Not well at all

If you were having a personal/emotional problem during this time, who did you seek help from? *Select all that apply.*

- ☐ A friend
- ☐ Professional
- ☐ Family member
- ☐ Spiritual leader
- ☐ Intimate partner/spouse
- ☐ I would not seek help from anyone.
- ☐ [ ] Other, please specify:

If you would not seek help from anyone during this time, why would you not seek help from others? *Select all that apply.*

- ☐ Overburdened/have a lot going on

- ☐ Not helpful/Do not have that kind of relationship
- ☐ Don't trust them
- ☐ [ ] Other, please specify:

Who are you currently staying connected with? *Select all that apply*.

- ☐ Friends
- ☐ Family
- ☐ Coworkers
- ☐ I am not staying connected.

How are you staying connected? *Select all that apply.*

- ☐ [ ] Social media, please specify:
- ☐ In person
- ☐ via e-mail
- ☐ via phone calls
- ☐ via video conferencing (i.e. Zoom, Google Meet, WebEx, WhatsApp, etc.)
- ☐ [ ] Other, please specify:

Why are you **NOT** staying connected?

- ○ Stress (fatigue, exhaustion)
- ○ Busy
- ○ Didn't have that kind of relationship prior to
- ○ Not a priority person to connect with
- ○ Lack of technology
- ○ Lack of transportation
- ○ Don't want to
- ○ [ ] Other, please specify:

Have you been watching, reading, listening to the news?

- ○ Yes

- ○ No

Which of the following is your **PRIMARY** source for news?

- ○ Newspaper (print or electronic)
- ○ Social media
- ○ Mainstream (i.e. CNN, FOX, MSNBC, Telemundo, Aljazeera)
- ○ Local news
- ○ Radio or Podcasts
- ○ [ ] Other, please specify:

Have you accessed psychological resources or materials during COVID-19 to assist with your overall mental health?

- ○ Yes
- ○ No

Have you accessed psychological counseling, therapy, support groups during COVID-19 to assist with your overall mental health?

- ○ Yes
- ○ No

Which of the following events may be contributing to your stress **as much or more than** the COVID-19 pandemic? *Select all that apply.*

- ☐ Political Climate
- ☐ Racial Injustice & Unrest
- ☐ [ ] Other, please specify:

Open Ended

How has the news and media influenced your mental health?

Thinking about life since COVID-19 has occurred, what is the biggest challenge, frustration, or problem during this time?

Thinking about life since COVID-19 has occurred (since March 30, 2020 when Governor Cooper issued the Stay at Home Order), what have been the **positives**, **benefits**, or **silver linings**?

Think about what you have accomplished during this pandemic, what you have been most proud of accomplishing during this pandemic, and what you intend to continue even after life returns to the "new normal." *Please share below.*

PHQ

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Little interest or pleasure in doing things

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Feeling down, depressed or hopeless

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Trouble falling or staying asleep, or sleeping too much

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Feeling tired or having little energy

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Poor appetite or overeating

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Feeling bad about yourself — or that you are a failure or have let yourself or your family down

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

Trouble concentrating on things, such as reading the newspaper or watching television

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

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

- ○ Not at all
- ○ Several days
- ○ More than half the days
- ○ Nearly every day

GAD-7

Over the past two weeks, how often have you been bothered by the following feelings?

Feeling nervous, anxious or on edge

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

Not being able to stop or control worrying

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

Worrying too much about different things

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

Trouble relaxing

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

Being so restless that it is hard to sit still

- ○ Not at all
- ○ Several days

- ○ More then half the days
- ○ Nearly every day

Becoming easily annoyed or irritable

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

Being afraid as if something awful might happen

- ○ Not at all
- ○ Several days
- ○ More then half the days
- ○ Nearly every day

PSS-10

These questions ask you about your feelings and thoughts during the **last month**. In each case, you will be asked to indicate how often you felt or thought a certain way.

In the last month, how often have you been upset because of something that happened unexpectedly?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt that you were unable to control the important things in your life?

- ○ Never
- ○ Almost Never

- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt nervous and “stressed”?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt confident about your ability to handle your personal problems?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt that things were going your way?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you found that you could not cope with all the things that you had to do?

- ○ Never
- ○ Almost Never
- ○ Sometimes

- ○ Fairly Often
- ○ Very Often

In the last month, how often have you been able to control irritations in your life?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt that you were on top of things?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you been angered because of things that were outside of your control?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often
- ○ Very Often

In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- ○ Never
- ○ Almost Never
- ○ Sometimes
- ○ Fairly Often

- ○ Very Often

BRCS

Please consider how well the following statements describe your behavior and actions **since the beginning of this pandemic**.

I look for creative ways to alter difficult situations.

- ○ Does not describe me at all
- ○ Does not describe me
- ○ Neutral
- ○ Describes me
- ○ Describes me very well

Regardless of what happens to me, I believe I can control my reaction to it.

- ○ Does not describe me at all
- ○ Does not describe me
- ○ Neutral
- ○ Describes me
- ○ Describes me very well

I believe I can grow in positive ways by dealing with difficult situations.

- ○ Does not describe me at all
- ○ Does not describe me
- ○ Neutral
- ○ Describes me
- ○ Describes me very well

I actively look for ways to replace the losses I encounter in life.

- ○ Does not describe me at all
- ○ Does not describe me

- ○ Neutral
- ○ Describes me
- ○ Describes me very well

MSPSS

We are interested in how you feel about the following statements. Read each statement carefully. Please indicate the extent to which you agree with each of the following statements:

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1. There is a special person who is around when I am in need.	○	○	○	○	○	○	○
2. There is a special person with whom I can share my joys and sorrows.	○	○	○	○	○	○	○
3. My family really tries to help me.	○	○	○	○	○	○	○
4. I get the emotional help and support I need from my family.	○	○	○	○	○	○	○
5. I have a special person who is a real source of comfort to me.	○	○	○	○	○	○	○
6. My friends really try to help me.	○	○	○	○	○	○	○
7. I can count on my friends when things go wrong.	○	○	○	○	○	○	○
8. I can talk about my problems with my family.	○	○	○	○	○	○	○
9. I have friends with whom I can share my joys and sorrows.	○	○	○	○	○	○	○

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
10. There is a special person in my life who cares about my feelings.	O	O	O	O	O	O	O
11. My family is willing to help me make decisions.	O	O	O	O	O	O	O
12. I can talk about my problems with my friends.	O	O	O	O	O	O	O

DeJong Gierveld Loneliness Scale

We would like to ask you a few questions to enable us to measure how helpful your social and emotional relationships during this time. When answering the questions, you could take account of the following:

- There are no right or wrong answers.
- We would like you to be completely honest.
- In answering the questions, it is best to think of your life as it generally is now.

I experience a general sense of emptiness.

- O Yes
- O More or Less
- O No

I miss having people around me.

- O Yes
- O More or Less
- O No

I often feel rejected.

- O Yes

- ○ More or Less
- ○ No

There are plenty of people I can rely on when I have problems.

- ○ Yes
- ○ More or Less
- ○ No

There are many people I can trust completely.

- ○ Yes
- ○ More or Less
- ○ No

There are enough people I feel close to.

- ○ Yes
- ○ More or Less
- ○ No

Risk Messaging

Based on your responses, you may be at clinically significant risk for emotional distress related depression or anxiety. If you are experiencing any distress and need immediate assistance, especially if the situation is potentially life threatening, call 911 or Campus Police at 704-687-2200. You may also reach the National Crisis Text line by texting HOME to 741741.

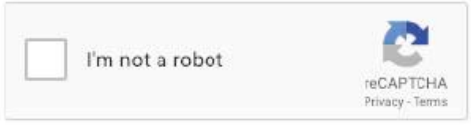
Disclaimer: Please note, the scales and scores used in this study do not reflect any particular diagnosis or course of treatment. They are meant as a tool to help assess your emotional and mental well-being. If you have any further concerns about your current well-being; if you are feeling upset, disturbed; or if taking part in this survey has brought up uncomfortable feelings, please contact the following based on your university role:

1. **Students:** the UNCC Center for Counseling and Psychological Services (CAPS) https://caps.uncc.edu/ or call CAPS at 704-687-0311. CAPS provides individual, couples, and group counseling services, consultation, outreach, and psychiatric services to support UNC Charlotte students in addressing personal, relationship, developmental, academic, or other concerns.
2. **Faculty/Staff:** ComPsych via the Employee Assistance Program (EAP) https://hr.uncc.edu/employee-relations/compsych-guidance-resources-employee-assistance-program or call 1- 877-603-8259. ComPsych provides confidential counseling, work-life solutions, financial information and resources, legal support and resources, COVID-19 specific resources, and mental health resources to support UNCC faculty and staff.

Debrief

Is there anything else that you wanted to share or thought we would ask and were prepared to answer? If so, please share here:

CAPTCHA



Thank you for taking part in our survey! Your responses will be recorded when you click on the → ***button** below.*

*On the next page, you will be able to enter your email address to win **one of ten $50 Amazon gift cards***

If you are feeling upset, disturbed; or if taking part in this survey has brought up uncomfortable feelings, please contact the following based on your university role:

1. ***Students***: *The UNC Charlotte Center for Counseling and Psychological Services (CAPS) provides individual, couples, and group counseling services, consultation, outreach, and psychiatric services to support UNC Charlotte students. CAPS is located behind the Student Health Center at the corner of Mary Alexander Road and Cameron Blvd. Office hours are 8:00 AM to 5:00 PM Monday through Friday. Evening hours are available by appointment.*
2. ***Faculty/Staff***: *University of North Carolina at Charlotte has partnered with ComPsych GuidanceResources® Worldwide to provide support services via the Employee Assistance Program (EAP). Please visit the website https://hr.uncc.edu/employee-relations/compsych-guidance-resources-employee-assistance-program or call 1- 877-603-8259. ComPsych provides confidential counseling, work-life solutions, financial information and resources, legal support and resources, COVID-19 specific resources, and mental health resources to support UNCC faculty and staff.*

If immediate assistance is needed, especially if the situation is potentially life threatening, call 911 or Campus Police at 704-687-2200.

***** Please click* ***button*** *to submit your answers *****

You will be redirected to where you'll be able to enter your email address if you would like to be entered for a chance to win ***one of ten $50 Amazon gift cards.***

Winners will be notified via email in ***approximately*** ***one month*** *once the survey is closed.*

Thank you again for taking part in our study! Please stay safe and stay healthy! Remember to take care of your whole self during this unprecedented time; this includes your physical, emotional, mental, and spiritual health.

For more evidenced based information related to COVID-19, please visit any of the following sites:
The Centers for Disease Control and Prevention: https://www.cdc.gov/coronavirus/2019-ncov/index.html
Mecklenburg County Public Health Department; or your current local health department: https://www.mecknc.gov/covid-19/Pages/Home.aspx

For more information related to Mental Health, please visit any of the following sites:
National Alliance for Mental Illness: https://www.nami.org/Support-Education/NAMI-HelpLine/COVID-19-Information-and-Resources

Psychology Today's Find a Therapist: https://www.psychologytoday.com/us/therapists
You may also reach the National Crisis Text line by texting HOME to 741741.