INCIDENCE OF DEPRESSION, ANXIETY, AND STRESS IN PRE-MEDICAL UNDERGRADUATE STUDENTS AT THE UNIVERSITY OF CALIFORNIA, RIVERSIDE

By

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A Capstone Project Submitted for Graduation with University Honors

May 20, 2022

University Honors
University of California, Riverside

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ABSTRACT

Stress, anxiety, and depression have long since affected the health of medical students and physicians in America. Numerous studies have confirmed that medical students and physicians are at a higher risk of burnout, depression, and stress in comparison to other professionals. It has been noted that the mental health of students begins to decline as early as their undergraduate education. Universities are equipped with resources to support the mental health of their students. However, it has been a long-standing question of how much these resources are accessed by the students who need them, partially due to two factors; a lack of awareness of such resources, and stigmas associated with seeking them. The pandemic impacts this situation further in that both past ways of informing students of needed resources have been completely disrupted, and stress has increased. The goal of this study is to uncover depression, stress, and other mental health conditions in pre-medical undergraduates at the University of California, Riverside (UCR) by utilizing standardized questionnaires, such as the PHQ-9 and GAD-7. By conducting this research, the findings would allow the University to improve the mental health of their undergraduate students, such as through establishing a program or intervention to promote the importance of mental health and wellness. Through this recognition, this research hopes to lessen the consequences of depression and burnout in medical students' academic and professional performance such as lower-quality patient care and poor grades by targeting anxiety and depression in the undergraduate years.

ACKNOWLEDGEMENTS

I would like to thank my faculty mentor and principal investigator, Dr. Kendrick Davis, for his unwavering support, mentorship, and compassion throughout the entirety of my undergraduate career. I would also like to thank my medical student mentor, Mutahir Farhan, for his continued patience, understanding, and guidance over the past four years. Dr. Davis and Mutahir have been critical in developing my skills as a researcher, helping me grow as a student and person. I am beyond grateful for the continued support that I have received from my colleagues and mentors as a part of our research group. Dr. Kendrick Davis has supported me and Mutahir in a multitude of projects, guiding and supporting our endeavors in improving health literacy via TikTok. I am beyond grateful for the environment and safe house that we cultivated, providing me a home away from home. I would also like to thank my family and friends for their constant encouragement and support during the completion of my capstone project. With my multitude of experiences, memories, and learned lessons from this lab, I am honored to have met and worked with the individuals in my lab as I will take all that I have learned for the remainder of my professional career. In addition, I would like to thank the CNAS Academic Advisors, as well as HPAC, for supporting this project and my efforts by assisting me with sharing my survey with the undergraduate population of UCR.

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INTRODUCTION

As young adults transition into the next stages of their lives, they attend universities and gain higher education in order to prepare themselves for the professional world. It is at these institutions that there is potential for a quick build-up of stress and pressure due to the academic and social lifestyles. As a result, many students may face mental health struggles, such as depression and anxiety, though few take action and seek treatment. Few studies have been conducted to identify the root of these issues, or even to determine what further steps universities can take to help and support students as they take action and seek treatment as needed for their mental health struggles.

College is known to be one of the most stressful times for many students as it comes along with facing adult life without having mastered any skills or the maturity of adulthood, and for most, this is a path that they must face without the safety of their home. Many college students face the uncertainties of what comes next in college and life, which potentially leads to the first onset of mental health conditions or an exacerbation of their symptoms (Pedrilliet al., 2015). Each student has a unique background and experience and will face their own set of challenges when coming to college. On top of taking on more responsibilities, students have to balance an intense academic load while preparing a competitive profile to be accepted into their desired career field. As a pre-medical student, the magnitude of stress, academic rigor, and expectations increase as students work toward their medical school applications. Pre-health students face a similar degree of expectations as they move to careers as a physician assistant, an optometrist, among many others. It is important to identify and treat the mental health symptoms that arise in young students today as they can carry the symptoms into professional education and even their professions, limiting their ability to perform to the best of their ability.

This study aims to identify the incidence of stress, anxiety, depression, and other mental health disorders in pre-medical undergraduate students at UCR through the use of standardized questionnaires, including the Patient Health Questionnaire-9 (PHQ-9) and the General Anxiety Disorder-7 (GAD-7). Responses from students remained anonymous and at the end of the survey, students were provided with free resources that they can utilize to improve their mental health. The primary predictions of this study were that: (1) there will be a higher incidence of anxiety and depression among pre-medical students than pre-health students, (2) females will present more severe symptoms of anxiety and a more severe risk of depression, and (3) upperclassmen (juniors and seniors) will present more severe symptoms of anxiety and a more severe risk of depression than lowerclassmen (freshmen and sophomores). Ultimately, the findings of this study may be used to improve the mental health of undergraduate students at UCR by connecting them with resources available on campus. With the absence of depression and stress, we are hoping to positively impact the mental health of medical students and help them increase not only their productivity but also their learning and patient care.

LITERATURE REVIEW

Burnout, stress, and depression are a huge burden on the health of numerous medical students nationwide with many studies confirming that the symptoms/conditions aforementioned are common among medical students and other medical professionals. Recent data on depression and stress in medical schools in the United States is limited; however, the American Association of Medical Colleges (AAMC) conducted a questionnaire in 2016 that would help organizations such as AAMC and medical schools identify and address issues within the future of medical education and the well-being of medical students. Medical education is very rigorous as students

can face stress at levels that are hazardous to their physical and psychological well-being (Lee & Graham, 2001; Dyrbye et al., 2016). Even though a benign degree of stress has the possibility to sprout creativity and achievement, the intense pressures and relentless demands of medical education may impair student behavior, diminish learning, destroy personal relationships, and, ultimately, affect patient care (Lee & Graham, 2001). As students progress through their medical education, they begin to have a general decrease in physical health and emotional wellbeing.

A meta-analysis of studies of medical students from 43 countries in 2016 showed a global prevalence of major depression at 27.2% and suicidal ideation at 11.1% (Rotenstein et al., 2016). Medical students, residents, and physicians have each demonstrated a higher trend of prevalence of anxiety, burnout, depression, and suicidal ideation (Onyishi et al., 2016). In turn, this can affect the long-term health of medical students and professionals as instances of severe depression have been linked to a higher risk of future depressive episodes and greater long-term morbidity, even having detrimental effects on patient care (Dyrbye et al., 2016; Clarke et al., 2009; Garlow et al., 2008). Numerous studies have found that stress, anxiety, and depression have been negatively affecting the health of medical students and physicians in America (Lee & Graham 2001; Yaghmour et al., 2017). Additionally, studies have confirmed that medical students and physicians are at a higher risk of burnout, depression, and stress in comparison to those in other professions (Fang et al 2010; Fang et al 2012). Recently, medical schools in the United States have initiated health promotion programs and have reported positive results in reducing the negative effects of stress on medical students' health and academic performance (Lee & Graham, 2001; Drolet & Rodgers, 2010). Following these studies, it is pertinent to better understand and target depression and stress amongst medical students. Not only have numerous studies found depression and stress to be prevalent among medical students, but suicide is

alarmingly increasing for U.S. resident physicians, as it is the leading cause of death for males and the second leading cause of death for all residents in 2017 (Yaghmour et al., 2017). However, studies have found that burnout, depression, and stress arise from the undergraduate education of these medical professionals and students; thus, it is pertinent to determine if students reach their peak point in anxiety and depression during undergraduate education (Sevlever, 2010; Fang et al., 2010; Fang et al., 2012).

Students in their undergraduate years experience high levels of burnout that are often associated with several different dimensions, including prolonged stress, a heavy workload, an imbalance between work and other aspects of life, and various aspects of personality (Lang, 2019; Straud & McNaughton-Cassill, 2019). It has been noted that the high-stress environment of college, the significant workload, and the resulting decreased time spent with family and friends contributed to an overall increased level of burnout in college students (Lang, 2019). From an early age, premed student expectations are high as they have increasing pressure to achieve high-grade point averages, score high on the Medical College Admission Test (MCAT), and engage in an abundant amount of extracurricular activities among the many other factors each student is judged upon (Fang et al., 2010). It has been noted that premed students with higher general anxiety are more likely to change their major and career path (England, Brigati, & Schussler, 2017). In fact, students with higher levels of depressive symptomatology were associated with a significant decline in medical career interest (Grace, 2018). During the pandemic, the need for physicians and medical professionals is at an all-time high while the supply of physicians is extremely low. In turn, the symptoms of high anxiety, burnout, and depression will affect the long-term health of these individuals as medical students and professionals.

Research on student mental health is severely out of date; therefore, it is pertinent to have a critical evaluation of medical students and to determine the root of the anxiety, depression, and stress at an undergraduate student level in order to improve the mental health of these future practitioners. At the University of California, Riverside (UCR), I conducted a Quality Improvement project in order to improve student mental health and spread awareness of the resources available to them. In this study, I investigated if the implementation of a web-based survey improved the dissemination of mental health resources to undergraduates in the College of Natural and Agricultural Sciences (CNAS) at UCR.

METHODOLOGY

In line with the UCR School of Medicine (UCR-SOM), I implemented an anonymous, web-based survey to assess and evaluate burnout, depression, and stress for pre-medical undergraduate students at UCR. The questionnaire used in this study included the PHQ-9 to screen for the severity of depression and the GAD-7 screened for the symptoms of anxiety. An additional set of questions pertaining to demographics regarding the major, year, gender, career aspirations, and financial situations of the participating students was added to better understand the student population demographics. All procedures were approved by the Institutional Review Board (IRB) at the University of California, Riverside.

Participants & Data Collection

The participants of this study were pre-medical, pre-health, and other career-oriented undergraduate students at UCR. Participants were recruited via email communications from the Health Professions Advising Center (HPAC) and various academic counselors representing the

College of Natural & Agricultural Sciences (CNAS) as both advise and oversee many pre-medical students at UCR. I also communicated with various student groups to help share the questionnaire with the undergraduate student population. This study took place as an online survey via Qualtrics so that students can take on their own electronic devices.

Procedures

Before taking the survey, students were made aware that the survey and diagnostic tools (PHQ-9 and GAD-7) were being used for research purposes only, not diagnosing. All participants were required to read and complete a consent acknowledgment at the beginning of the survey that described the use of the survey and its anonymous nature to move forward in participating in the study. Progression to questions in the survey was only conditional upon the acknowledgment statement (e.g. participants would not be able to continue to take the questionnaire if they did not read and accept the acknowledgment statement).

At the end of the survey, students were provided with some of the free mental health resources that the campus provides. This included information to contact UCR's Counseling & Psychological Services (CAPS) program, The Well, and the Student Affairs Case Management office.

Measures

In order to determine which factors would contribute to the anxiety, depression, and stress symptoms faced by undergraduates, multiple questions in varying categories were used in the questionnaire. They are listed as follows.

1. **Demographics**

This section consisted of nine questions that focused on the demographics of the participants. The demographics that were measured are as follows: major (open-ended for participants to manually enter), UCR student (yes, no), class standing as an undergraduate (freshmen, sophomore, junior, senior, other [open-ended for participants to manually enter]), age (open-ended for participants to manually enter), gender (male, female, non-binary/third gender, other [open-ended for participants to manually enter]), the college the participant is a part of, race/ethnicity, is the student pre-med, pre-health, or in a different career-oriented group, and career aspiration.

2. **Financial Measures**

Two financial-based questions were asked of the students. The use of these questions was to gauge how a student's current financial situation contributed to the amount of stress they feel while taking into account the effects it has on their education. These questions were measured by scales to assess the role of finances on student mental health (not at all, somewhat concerned, moderately concerned, extremely concerned).

3. **Depression and Suicide Risk (PHQ-9)**

The standardized PHQ-9 questionnaire was used in this survey to measure the level of depression in participants. However, the questionnaire was modified as the ninth question in the diagnostic tool was omitted from the survey. The question that was omitted read: Thoughts that you would be better off dead or of hurting yourself in some way.

4. **Anxiety Risk (GAD-7)**

The standardized GAD-7 questionnaire was used in this survey to measure the level of anxiety and worry in participants. Students were asked a set of seven questions that would be used to measure their risk for anxiety.

Analysis

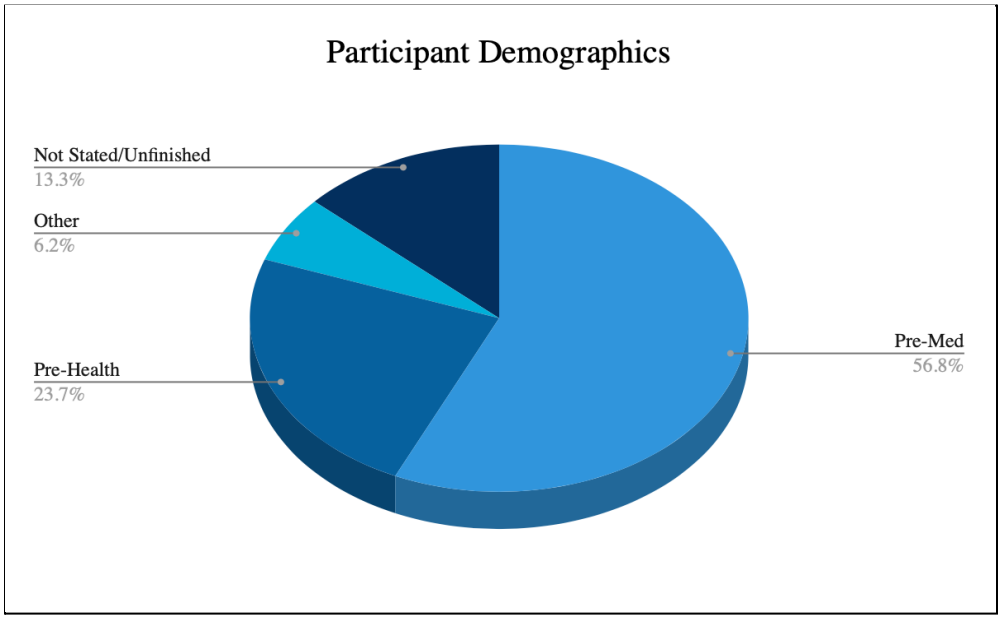
Upon obtaining the results, we ran a general stratification to observe the prevalence of anxiety and depression and categorized the results. PHQ-9 and GAD-7 results were individually calculated using their general scoring criteria. A general cross-sectional analysis was conducted to find the prevalence of anxiety and depression between various genders and ethnicities.

RESULTS

Student Demographics

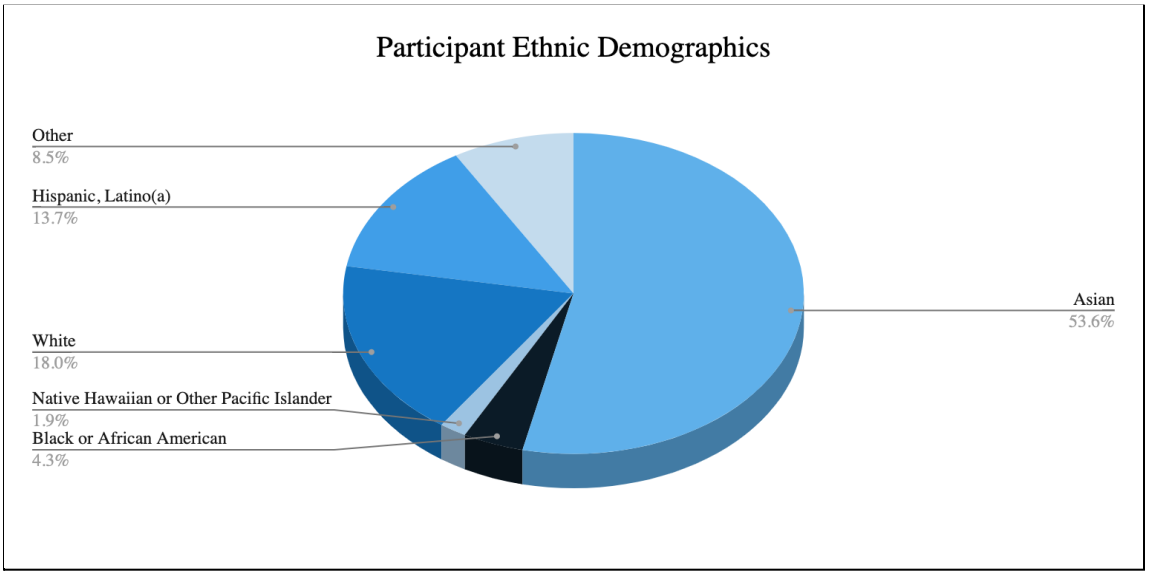
241 surveys were collected; however, those who did not fully complete the survey were omitted from the analyzed data, totaling the participant count to 211. Participants ranged in age from 18 to 49, with participants predominantly being 18-22 years of age. 107 participants were female, 102 participants were male, and two participants classified themselves as “other.”

Figure 1: Participant Demographics



As seen in Figure 1 (above), 137 participants were pre-med (~57%), 57 were pre-health (~24%), and 15 were either undecided or were looking into other careers (~6%).

Figure 2: Participant Ethnic Demographics

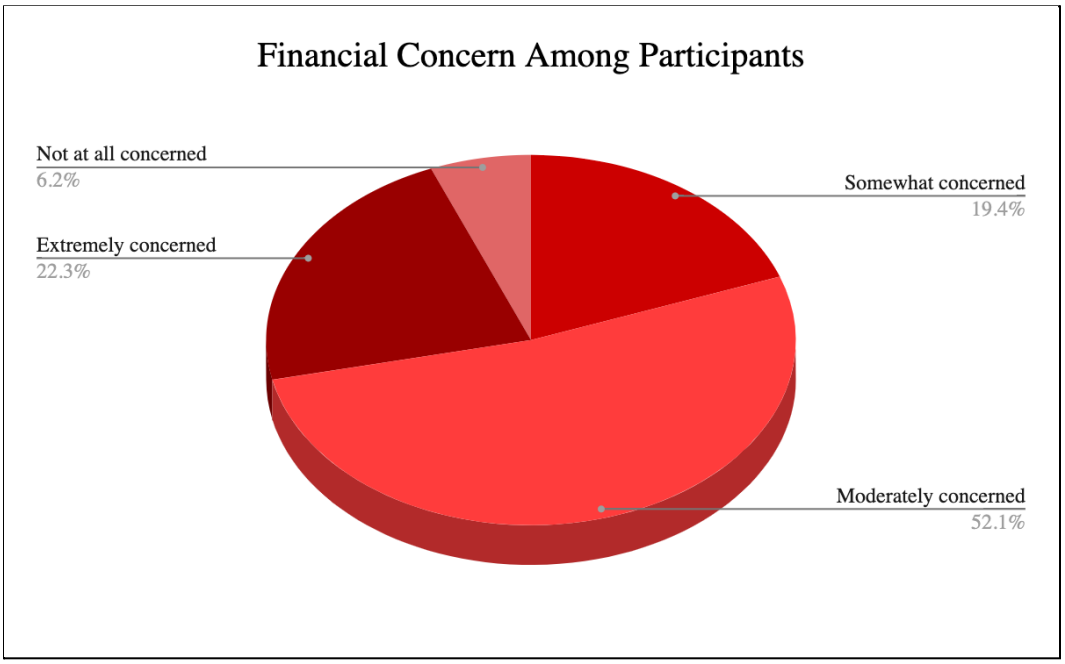


For race/ethnicity, the majority of participants identified as Asian (53.6%), followed by those who identified as White (~18%), followed by those who identified as Hispanic/Latino(a) (13.7%), respectively seen in Figure 2 (above).

Financial Considerations

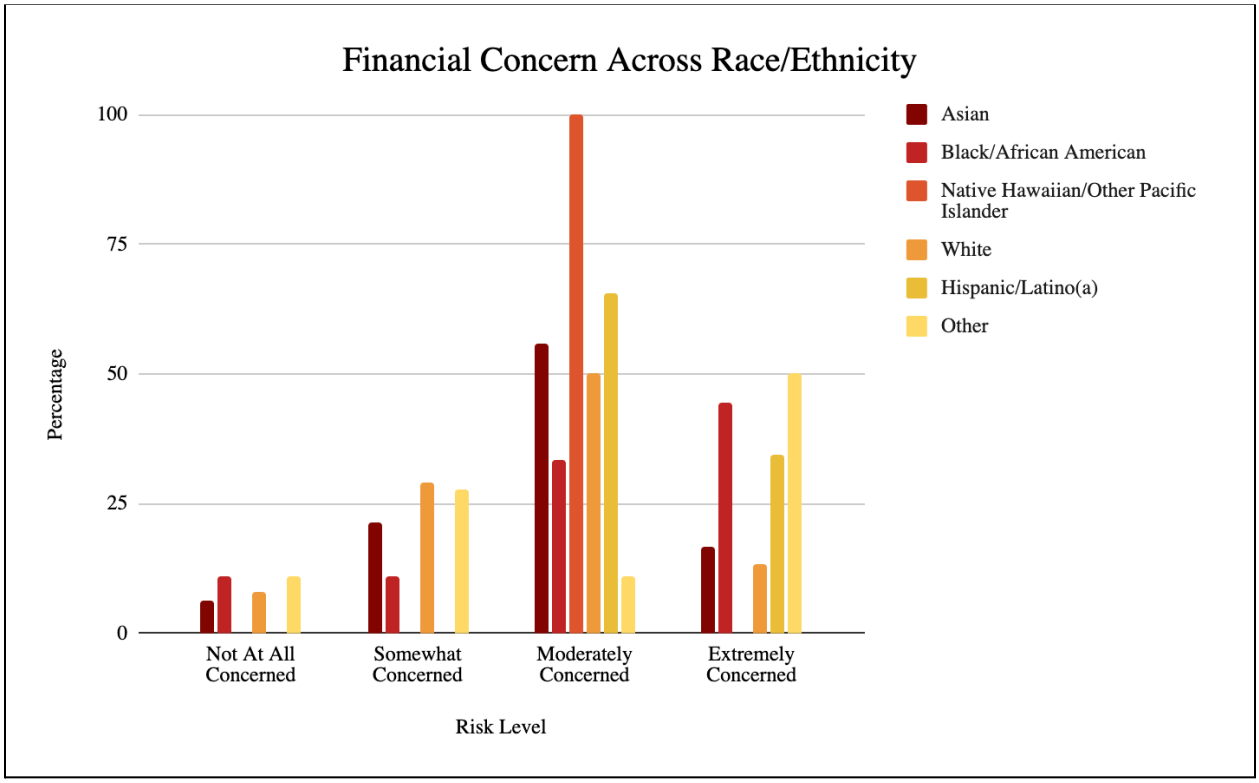
Financial concern responses were coded and a scale would be applied to rank the severity of concern. Responses for "Not at all Concerned" were coded as 0, "Somewhat concerned" were coded as 1, "Moderately concerned" were coded as 2, and "Extremely concerned" were coded as 3. A total score of 0 meant that individuals were "Not at all concerned" regarding their finances, a total score from 1 to 2 meant that individuals were "Somewhat concerned" regarding their finances, a total score from 3 to 4 ranked individuals to be "Moderately concerned," and a total score from 5 to 6 meant individuals were extremely concerned.

Figure 3: Financial Concern Among Participants



When asked about financial concerns, it was shown that over half of the survey participants (52.1% of students) were moderately concerned about their financial status. 22.3% of students who participated were extremely concerned as seen in Figure 3. 19.4% of students in the survey were somewhat concerned and 6.2% were not at all concerned. Riverside, and the greater Inland Empire itself, is an area that has a lot of poverty. Low-income communities such as these generally face many financial concerns, as there are a variety of factors that influence this.

Figure 4: Financial Concerns Across Race/Ethnicity



In the "Not At All" and "Somewhat Concerned" with financial status both Native Hawaiian/Other Pacific Islander and Hispanic/Latino(a) were at 0% in these categories. 100% of the Native Hawaiian/Other Pacific Islander participants were moderately concerned about

financial status. Hispanic/Latino(a) were the second highest of participants who were moderately concerned. Asian participants were third most moderately concerned about financial status, fourth highest were white participants, fifth were Black/African Americans, and students who identified as others in race (Caucasian, Racially Mixed, Middle Eastern, etc.) were least moderately concerned about finances. 50% of the other participants were extremely concerned about finances, which is the highest in this category. Black/African Americans were the second highest in extremely concerned; however, there were only nine total participants from this ethnic group. Third highest in the category were Hispanic/Latino(a), fourth were White participants, and the race least extremely concerned were Asian participants.

Mental Health Symptoms

Responses to the PHQ-9 and GAD-7 questionnaires were coded and the general clinical scoring scale would be applied to rank the severity of depression and anxiety. The following scoring criteria scales were used for the PHQ-9 and GAD-7:

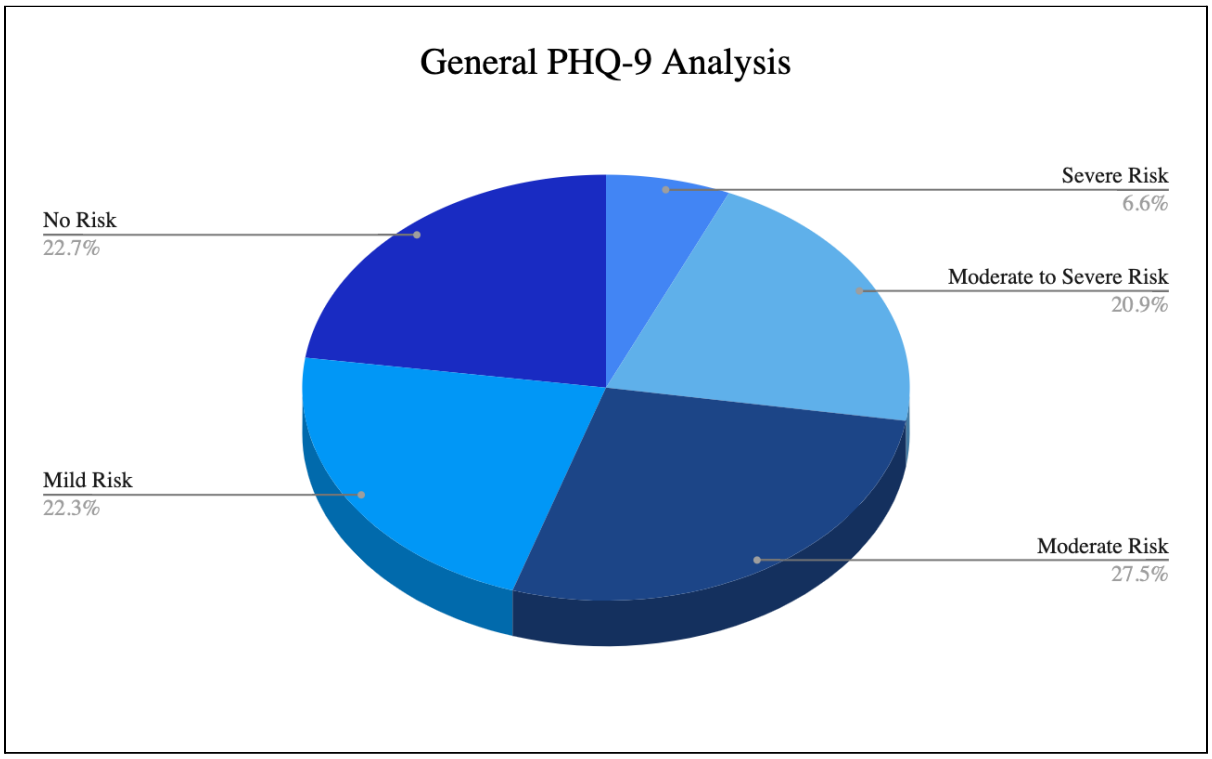
PHQ-9:

Score	Severity Level
1-4	None
5-9	Mild
10-14	Moderate
15-19	ModeratelySevere
20-27	Severe

GAD-7:

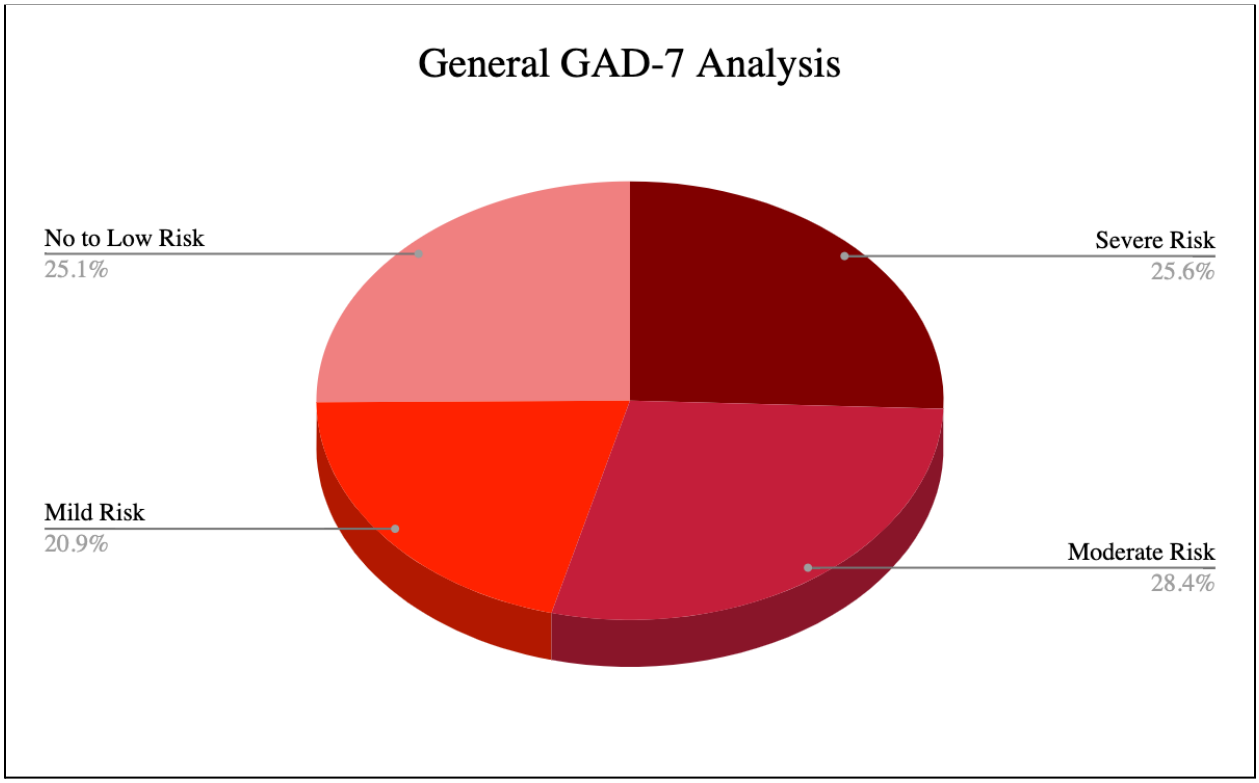
Score	Risk Level
0-4	No to Low Risk
5-9	Mild Risk
10-14	Moderate Risk
15+	Severe Risk

Figure 5: General PHQ-9 Analysis



A general analysis of the responses was stratified and analyzed regarding PHQ-9 focused questions as seen above in Figure 5. Of the 211 participants, 14 participants self-reported having a severe risk of depression, 44 reported having moderate to severe risk, 58 reported having moderate risk, 47 reported having mild risk, and 48 reported having no risk.

Figure 6: General GAD-7 Analysis

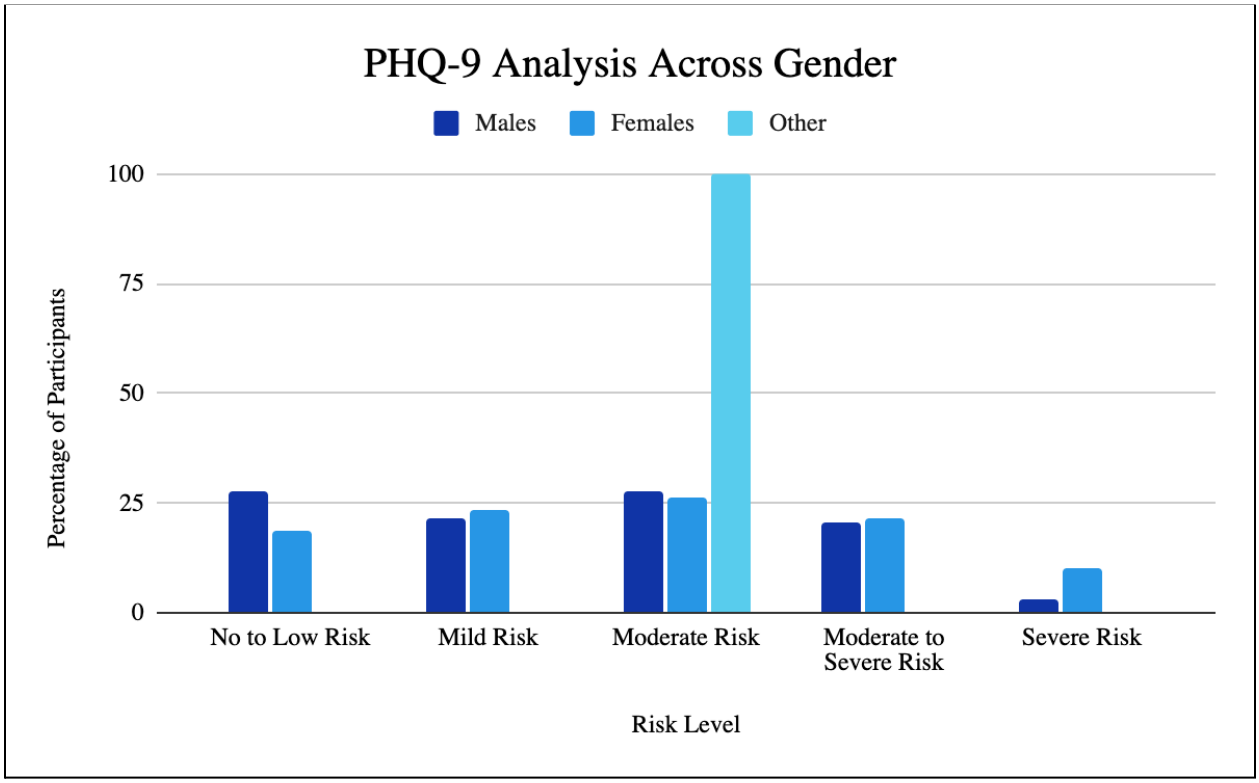


A general analysis of the responses was stratified and analyzed regarding GAD-7 focused questions as seen above in Figure 6. Of the 211 participants, 54 participants self-reported having severe symptoms of anxiety, 60 reported having moderate risk, 44 reported having mild risk, and 53 reported having no to low risk.

Cross Analysis Between Demographics and Mental Health Symptoms

The self-reported genders were split into three groups: males, females, and others. Each response was categorized into these three groups and analysis was run to compare the prevalence and risk level of depression and anxiety across different genders.

Figure 7: PHQ-9 Analysis Across Gender



The PHQ-9 analysis across gender was run to determine depression severity across genders. The data found that over 25% of males were at no to low risk for depression; whereas, females were lower than 25%. The participants that chose to identify as other genders were at 0% for no to low risk for depression. Furthermore, for the mild risk category males and females were under 25% but females had a higher risk; whereas, the participants who identified as other were at 0%. The participants that identified as other indicated 100% for moderate risk for depression, but both females and males for a little over 25% with which males scored higher. Both males and females participants were below 25% of having a moderate to severe risk of depression and other genders were at 0%. In the Severe Risk category, other genders were at 0% and both males and females were lower than 25%, but females indicated having a higher risk.

Figure 8: GAD-7 Analysis Across Gender

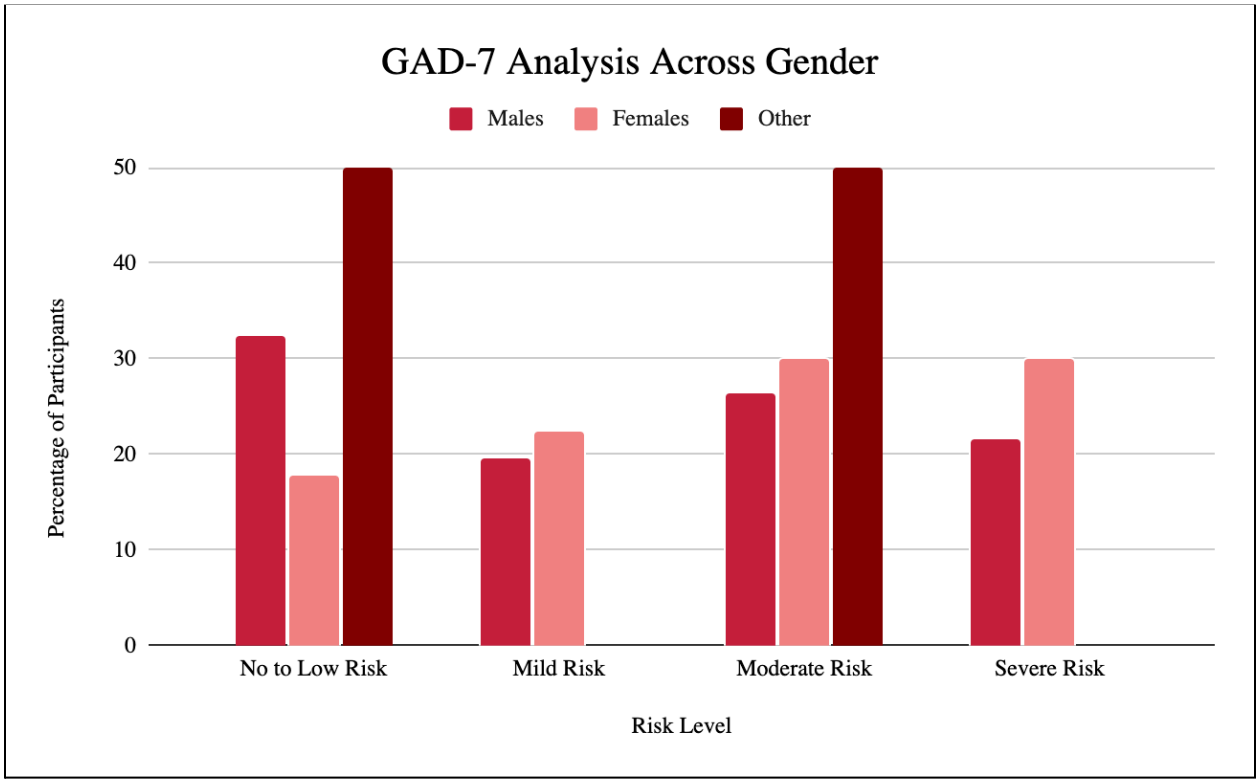
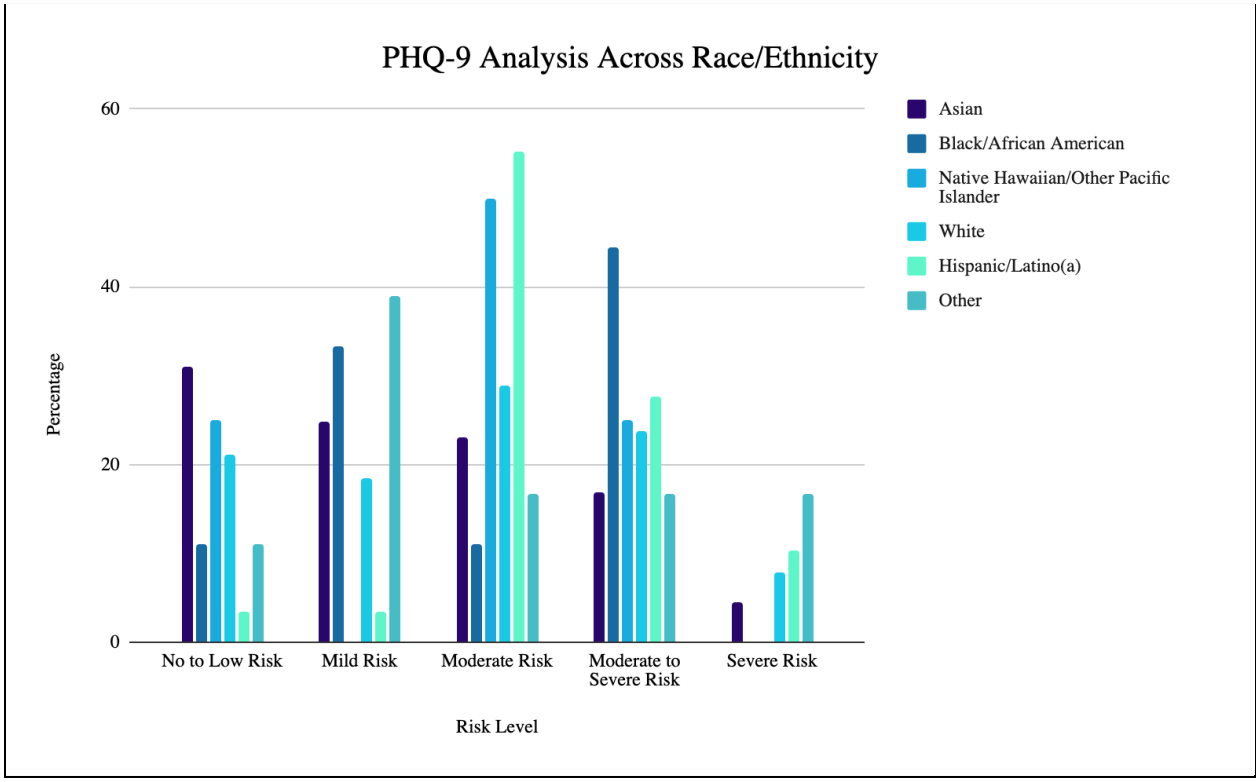


Figure 8 shows a GAD-7 for genders which is used to determine the severity of anxiety. Based on the data, the No to Low Risk for anxiety shows that over 30% of men who took the survey have no to low risk for anxiety. Below 20% of female participants fell under the no to low Risk category and those who identified as Other were at 50% for the no to low risk category. Females had a higher Mild Risk percentage compared to Men and those who identified as Other. However, both males and females were below 30% and males were below 20%. For the Moderate Risk category, 50% of those who identified as Other in the survey were at Moderate Risk, 30% of females in the survey were at moderate risk, and less than 30% of males in the survey were at Moderate Risk. For the Severe Risk category, 0% of those who identified as Other were at Severe Risk, 30% of females in the survey were at Severe Risk, and a little higher than 20% of Males in the survey were at Severe Risk.

Race/Ethnicity & PHQ-9

Analyzing the breakdown of PHQ-9 scores by ethnic/racial groups showed which groups were more likely to have a higher risk of depression.

Figure 9: PHQ-9 Analysis Across Race/Ethnicity



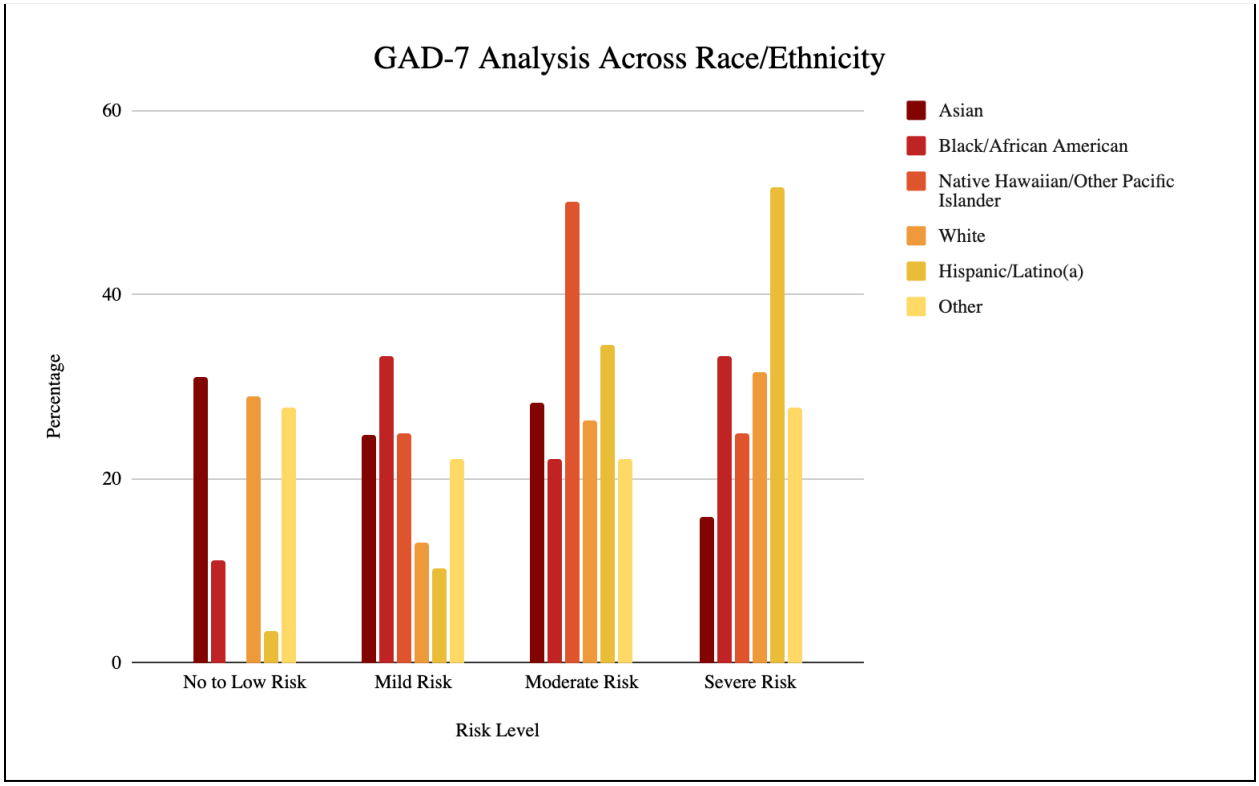
The graph shows that the majority of Asians who participated in the survey compared to other races show no to low risk of depression. Hispanic/Latino(a) were the lowest percentage in the no to low risk meaning they are more likely to suffer from depression. For the mild risk of depression category, those who identified as other were the highest percentage of mild risk while Native Hawaiin/Other Pacific Islander were at 0%. For the moderate risk category, Hispanic/ Latino(a) had the highest percentage of those who were at moderate risk for depression and the lowest percentage of participants were those who are Balck/African American. Black/African

American participants in the survey were highest in percentage for moderate to severe risk and the lowest percentage of students were those who identified as other. In the severe risk category, the participants who identified as Other had the highest percentage of those who were at severe risk, and the lowest percentage was of Black/African Americans and Native Hawaiin/Other Pacific Islander which were both at 0%.

Race/Ethnicity & GAD-7

Analyzing the breakdown of GAD-7 scores by ethnic/racial groups showed which groups were more likely to have a higher risk of anxiety.

Figure 10: GAD-7 Analysis Across Race/Ethnicity



As seen above in Figure 10, the majority of Asians who participated in the survey compared to other races show no to low risk for anxiety. Native Hawaiin/ Other Pacific Islander were at 0% in

the no to low risk for anxiety. For the mild risk category, Black/African American were the highest in percentage and Hispanic/Latino(a) were the lowest. In the moderate risk category, Native Hawaiian/Other Pacific Islander were the highest percentage of those who were at moderate risk for anxiety and the Black/African Americans were the lowest percentage in this category. In the severe risk category, Hispanic/Latino(a) were the highest percentage of participants, and Asians were the lowest.

DISCUSSION

Our study utilized a survey to determine the mental health status of undergraduate students at the University of California, Riverside. Our study generally found students were more likely to portray significant risk levels of anxiety and depression based on our general analysis of the PHQ-9 and GAD-7 results. This meant that a majority of the participants identified themselves to have the mental health symptoms of depression and anxiety, or a combination of the two, which would require an active treatment plan and future testing.

An analysis of the ethnic demographics of all the participants showed that there was a vast majority of Asian participants relative to other ethnic backgrounds. Different ethnic backgrounds have different sets of beliefs and values, which in turn impact how they view mental health. While individuals from certain backgrounds may be more receptive to the care they receive, others may not even believe that mental health issues exist or that they need the support. This analysis allows researchers to determine which ethnic backgrounds dominate the campus community and what support can be provided that best aligns with the student beliefs.

The financial situations of students were shown to add stress and worry to the educational experiences of students as well. More than half of the survey participants were moderately or

extremely concerned about their financial status. A great portion of students from UCR represents the Inland Empire. Unfortunately, the area of Riverside and more so the Inland Empire severely lacks education and income compared to other regions of California. According to the United States Census Bureau (2021), only 21.4% of individuals in San Bernardino County and 23.2% of individuals in Riverside County held a bachelor's degree or higher. In addition, the median household income for residents of San Bernardino and Riverside County were $65,761 and $70,732, respectively. Both the educational and income rate of these two counties suggest that many students face great pressure to be the first in their family to attend and/or complete their bachelor's degree all while escaping poverty which incrementally adds to the mental strain students face.

We also found that women have a higher risk of moderate to severe anxiety and were also more likely to self-report signs of severe anxiety. In addition, women self-reported symptoms that would classify them to have a moderate and severe risk of depression in comparison to men. Men were more likely to have no to low risk and mild risk levels of anxiety and depression. With the medical field being a male dominant workforce, females face more pressure in entering this field on top of their societal gender expectations such as starting and caring for a family.

We found that many Asian and Hispanic/Latino(a) self-reported a higher risk for anxiety and depression. Each culture and background has its separate views on mental well-being. With some having a stronger stigma than others, certain ethnic groups may in fact have a higher incidence of anxiety, depression, and stress, but may not show it due to social stigma. Quite specifically within the Asian-American community, there is an underlying fear of reaching out and getting mental health treatment for those going through mental health struggles. Seeking any form of help from those outside the immediate family or admitting that one is struggling with

their own mental health conflicts with the Asian cultural value of interdependence. Though over time, there has been more acceptance of mental health within this community today, this stigma still looms over the Asian community, as well as for many other ethnic backgrounds.

When premed students move onto medical school, they face one of the toughest academic and professional environments where stress is highly prevalent already. The rigorous duties of a medical student can lead to burnout, depression, and stress, which in turn can affect their interaction with patients and their job performance. To further evaluate the mental health of medical students, it was important to know where it stems from such as the premed stages. As found in our study, there was a strong prevalence of anxiety and depression among our undergraduate students. This represents the need in lessening the consequences of depression and anxiety as a pre-medical student as it can lead to more severe symptoms as a medical student, resident, and physician.

Limitations

Transparency is a very crucial part of our research, so we must be aware of the possibility of bias. In our study, it was possible that if students are aware that they are taking a questionnaire on their mental health, they may be prompted to answer the questions differently if they are facing these mental concerns versus being unaffected by them. Thus, not all of the participants may share entirely true information. With the stigma surrounding mental health, acknowledging any mental illnesses that college students may have may result in an increase in worries, both socially and academically. Studies have shown that students who have either been recently or are currently diagnosed with a mental illness are more likely to have lower academic performance

and success (Bruffaerts et al., 2018). It has been seen that this is not just applicable to college students, but rather to students of all grade levels.

In addition, assessing mental health symptoms and their severity in individuals can be challenging as all participants differ in culture, socioeconomic status, familiarity with research, and whether or not individuals have lived in a different country in the past providing difficulties in evaluating participants, among other factors (Murray, 2016). Students from different cultures and areas may have different ways to handle their depression and other mental symptoms. It can range from not expressing their pain to others or they may be open to finding ways to heal and mediate their pain. The level of risk and the definition of depression, anxiety, and stress may be perceived differently for each student. For example, a student can be evaluated to have low depression, stress, and anxiety compared to another individual that has the same symptoms but is evaluated as a high-risk participant. This is all dependent on how each student perceives their symptoms.

If a similar study was to be run in the future, we would include more demographic questions so we are able to better determine the social factors that affect the mental well-being of students. We would include more questions based on faith as this could play a role in how people perceive mental health. Another factor was socioeconomic status; more questions relating to this demographic are important since, as young adults, pre-medical students will be weary about loans, the amount of debt they take on, and the financial constraints students take on with their respective families.

Benefits & Future Outlook

Stress, anxiety, and depression have long since affected the health of medical students and physicians in America (Lee & Graham, 2001). Numerous studies have confirmed that medical students and physicians are at a higher risk of burnout, depression, and stress compared to other professionals (AAMC, 2017). Following the analysis of these studies, it is pertinent to better understand depression and stress amongst students and medical professionals so that we can best treat them. There is an indication that these mental health symptoms arise at a high level in the undergraduate level as a pre-medical student (Sevlever, 2010; Fang et al., 2010; Fang et al., 2012). With this study, it was our goal to identify the incidence of stress, anxiety, depression, and other mental health disorders in premedical students at UCR. This study might not only allow UCR staff to better identify students who may be suffering from depression, anxiety, and heightened stress, but also destigmatize the conversation about mental health and make it more inclusive in society. Mental health is important as it plays a crucial role in a student's education and career but also in the life choices they make socially. By detecting struggling students earlier, we can better support them through the stressful college and adult environment today.

There is proof that intervention and wellness programs can improve the mental and physical well-being of students along with their academic and professional performance. Most notably, William Norcross (2018) and his research team from the University of California San Diego (UCSD) reviewed the mental and physical health of their medical students and staff as the school introduced a revolutionary program: The Healer Education Assessment and Referral (HEAR) Program. The HEAR program identifies at-risk students, provides education and outreach to their students, and connects students with resources and support.

A similar project can be modeled for UCR's School of Medicine based on the UCSD Healer Education Assessment and Referral (HEAR) Program. The HEAR Program was designed to identify medical students, doctors, and medical staff members at UCSD and their associated locations who were at risk of burnout or other mental health issues associated with the nature of their work. This program used several different screening tools like the PHQ-9 and other questionnaires to figure out which members of their community were most at risk. By doing so, researchers and counselors were able to target and help those individuals better by providing them with the support and resources they needed to cope.

CONCLUSION

The educational route of a medical career requires great sacrifice, time, effort, and patience. The rigorous workload and expectations are represented in students as they show a decrease in physical health and emotional wellbeing. As mentioned throughout this study and paper, the medical field has shown evidence that medical professionals and medical students have a higher risk of burnout, depression, and stress compared to other professional careers.

In many countries around the world, such as the United States and Canada, medical students and professionals struggle with burnout, depression, and stress. Studies show that this mental state, in turn, impacts their ability to interact with patients in addition to performance issues at work. It is through this recognition our research hopes to lessen the consequences of depression and burnout in medical students' academic and professional performance such as lower-quality patient care and poor grades. Additionally, this research may help others by uncovering the mental health status of students at the UCR SOM and encouraging the establishment of an intervention program if results deem it necessary.

A multi-question survey was used in this study to determine what factors can influence the treatment methods in place for mental health issues of students at the University of California, Riverside. The results and data from this survey show there is a multitude of factors that contribute to the mental health of students on UCR's campus. It is important to note that these factors are not mutually exclusive from one another, rather different combinations of them can impact the mental health of students in differing ways. Addressing these factors in treatment methods is necessary to develop effective treatments.

Though UCR is already taking steps toward bettering the mental health of its students, there is still room for improvement in their processes. The results of this study can be used to further the current campus initiatives and delve into different avenues and approaches. The focus on demographics and other factors opens avenues for further research studies to determine the root causes of students' mental health issues and how this data can be used to benefit students in turn. Collecting the data from students themselves allows for the campus community to open conversation and raise awareness on mental health, continuing to cultivate a safe and open-minded community on campus. Students may be better connected with resources available on campus while increasing their academic productivity and the quality of patient care they deliver as future physicians.

Future Analysis

We intend to expand this research to uncover the incidence of various mental health symptoms and risks at the UCR SOM for medical students, residents, and medical professionals working as staff. As medical schools in the US have begun to initiate health promotion programs, they have reported positive results in reducing the negative effects of stress on medical

students' health and academic performance. We hope that there is an increase and betterment in academic and professional performance such as lower-quality patient care and poor grades by targeting anxiety and depression in the undergraduate years. Additionally, this research may help others by uncovering the mental health status of students and encouraging the establishment of an intervention program if results deem it necessary.

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