Project Report

THE IMPACT OF COVID-19 ON THE MENTAL HEALTH

Executive Summary

The COVID-19 pandemic had a profound impact on global mental health, creating a parallel crisis alongside the physical health challenges. The severity of mental health issues was largely caused by the strict measures put in place to stop the virus's spread, including lockdowns, social distancing, and economic disruptions.

In 2020, during the early phases of the pandemic, mental health issues became more prevalent across various demographic groups, irrespective of age, gender, race, ethnicity, educational background, or socioeconomic standing. The effects of isolation, financial strain, loss of loved ones, fear of infection, and uncertainty about the future were felt by many.

Mental health issues persisted as the pandemic spread into 2021 and beyond. During this time, there was a significant increase in the awareness of mental health issues, advocacy for mental health services, and the incorporation of mental health support into public health strategies. Over the years, the COVID-19 pandemic has brought attention to mental health issues and highlighted the need for strong, flexible mental health systems that can handle emergencies. This project will investigate the impact of the COVID-19 pandemic on the prevalence of anxiety and depression symptoms and explore various demographic and regional factors like age, sex, and region etc. This project will address five hypotheses which will provide insights on anxiety and depression in individuals over the last 3 years.

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Data Description: The data sources used in this project are listed below:

1. **Main Dataset:**

https://data.cdc.gov/NCHS/Indicators-of-Anxiety-or-Depression-Based-on-Repor/8pt5-q6wp

2. **Supporting Dataset**:

https://www.cdc.gov/mmwr/volumes/69/wr/mm6919a2.htm?s_cid=mm6919a2_w#T1_down

Data Cleaning

The data was clean and did not have any Null values within them, so there wasn't much data cleaning.

General Introduction

To rapidly monitor recent changes in mental health, the National Center for Health Statistics (NCHS) partnered with the Census Bureau on an experimental data system called the Household Pulse Survey. This 20-minute online survey was designed to complement the ability of the federal statistical system to rapidly respond and provide relevant information about the impact of the coronavirus pandemic in the U.S. Data collection began on April 23, 2020.

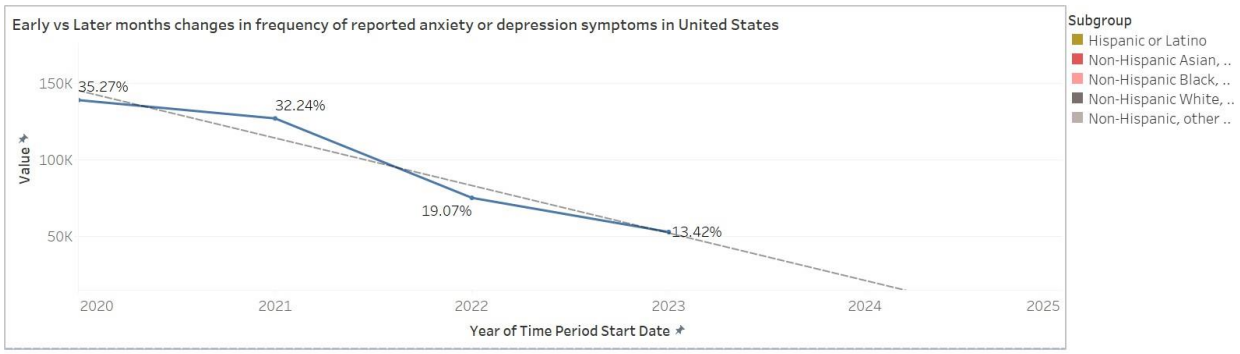
NCHS included questions to obtain information on the frequency of anxiety and depression symptoms. The questions are a modified version of the two-item Patient Health Questionnaire (PHQ-2) and the two-item Generalized Anxiety Disorder (GAD-2) scale on the Household Pulse Survey, collecting information on symptoms over the last 7 days (rather than the typical 14 days). Beginning in Phase 3.2 (July 21, 2021) of data collection and reporting, the question reference period changed from the 'last 7 days' to the 'last two weeks', as typical for this scale.

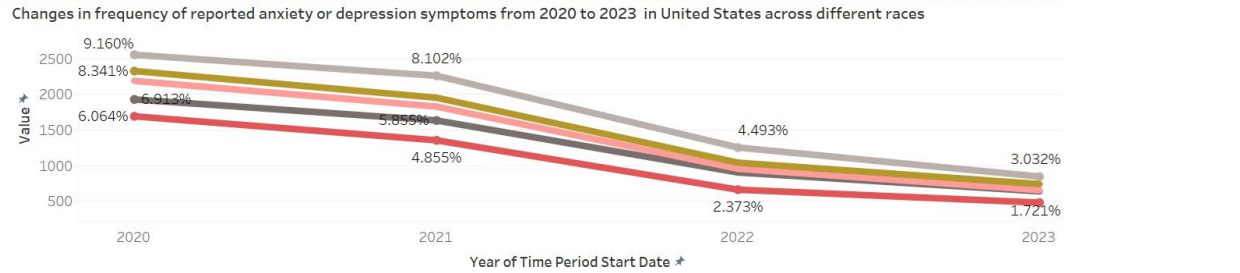
Estimates on this data are derived from the Household Pulse Survey and show the percentage of adults who report symptoms of anxiety or depression that have been shown to be associated with diagnoses of generalized anxiety disorder or major depressive disorder. These symptoms generally occur more than half the day or nearly every day. See the technical notes for more information on these measures.

Insights and Findings: In this project we have tested 6 hypotheses as below:

1. **Changes in the frequency of reported anxiety or depression symptoms are connected to the time of the COVID-19 pandemic (e.g., early vs. later months). It is theorized that symptom frequencies changed over time because of shifting pandemic conditions and public health efforts.**

During the early stages of the COVID-19 pandemic in 2020 in the United States, the graph shows high frequency of reported anxiety and depression symptoms with a value starting by 35.27%. This may be due to pandemic's initial uncertainty, quarantines, reality adjustments, which may have increased anxiety and depression among people.
In the later months and years of the COVID-19 pandemic in the United states, reported symptoms decreased significantly. The graph shows a decline to 13.42% by 2023 which may be due to vaccines, improved health measures and adaption to the pandemic (new reality).





In the above second visualization, the graph shows a clear downward trend in frequency of reported anxiety and depression symptoms across all racial groups from the start of the pandemic 2020 to 2023.
As shown in the graph, the highest recorded symptoms frequency was started by 9.160% in 2020 and decreased by 3.032% in 2023. Similarly, the lowest started by 6.064% and dropped by 1.721% by 2023. This change in the reduction of anxiety and depression symptoms can be societal adaptation to the pandemic by getting motivated to the new normal.
So, as the hypothesis suggests that changing pandemic conditions and public health efforts may have affected symptom frequencies. The numbers or the percentage decreased over time which can be many updated treatment options, frequent availability of vaccines, self-motivating and mental health awareness.

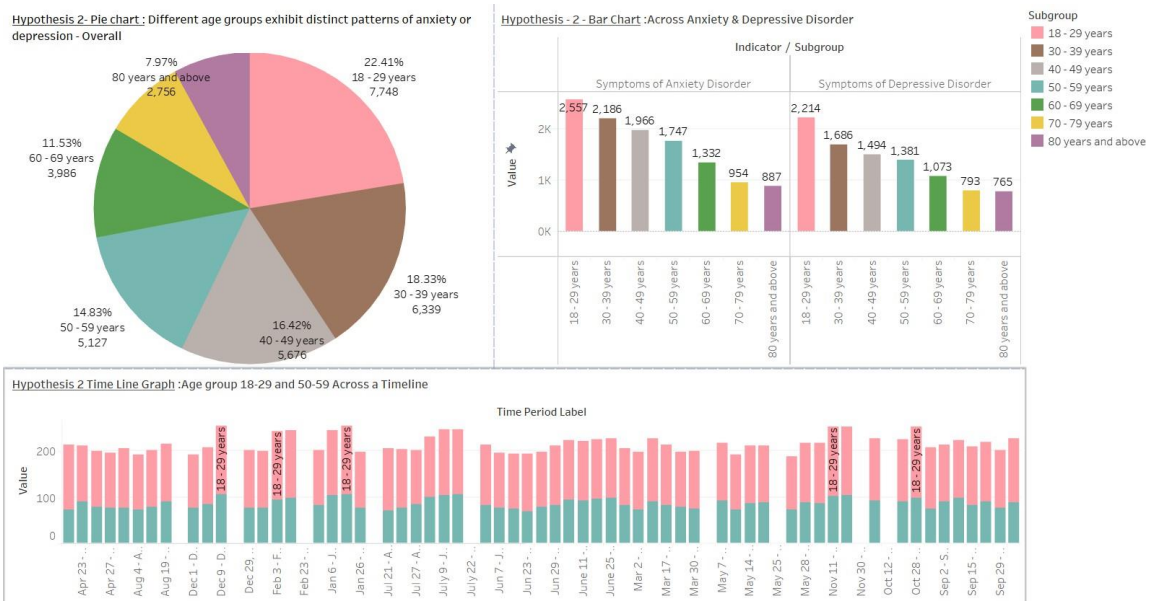
2. Different age groups exhibit distinct patterns of anxiety or depression symptom frequencies, with younger adults (e.g., 18-29 years) displaying notably higher levels than their older counterparts in the United States

This hypothesis states that individuals in the United States across different age groups exhibit distinct patterns of anxiety or depression differently. Specifically, it suggests that younger adults aged 18 to 29 might exhibit higher levels of these symptoms than their older counterparts.

The first pie chart shows that the 18-21 age group constitutes approximately 22% overall, the highest among other age groups. Additionally, the percentage decreases as age increases.

The second timeline graph visualizes anxiety and depression symptoms across a fixed time. Not only is there an overall trend of higher symptoms in the 18-29 age group, but this pattern holds in each specific instance when compared with the 50-59 age group.

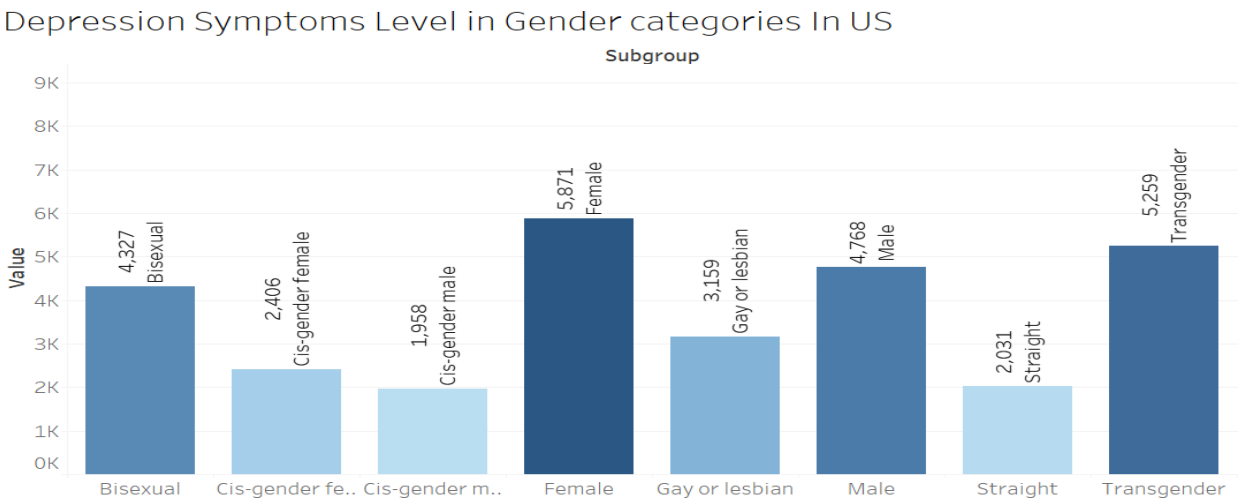
The third bar graph separates Anxiety and Depressive Disorders. It reveals that younger people exhibit higher levels of both anxiety and depressive disorders, with a gradual decrease as age increases in both cases.



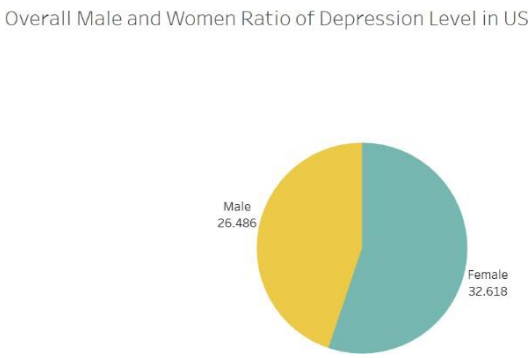
3. Gender significantly influences the frequency of reported anxiety or depression symptoms, with women consistently reporting elevated symptom levels in comparison to men in United States as they face postpartum depression.

Our hypothesis delves into the intricate relationship between gender and the frequency of reported anxiety or depression symptoms, specifically focusing on the elevated levels reported by women compared to men in the United States, particularly in the context of postpartum depression.

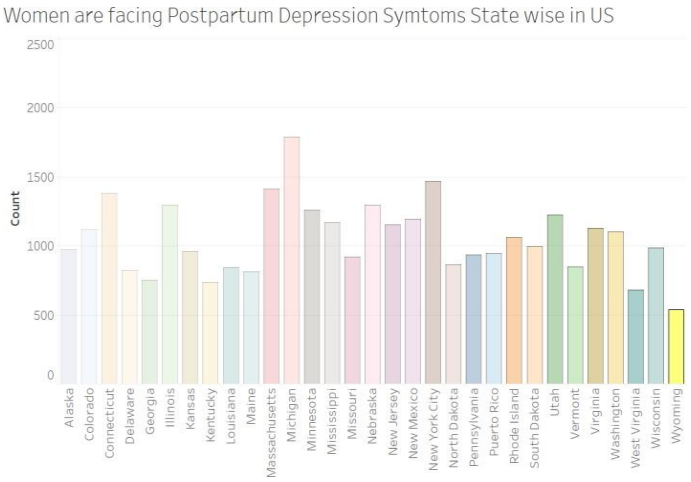
To ensure a comprehensive analysis, our study considers a diverse spectrum of gender identities, including male, female, transgender, bisexual, straight, gay or lesbian, cis-gender male, and cis-gender female. The inclusion of these subgroups aims to provide a nuanced understanding of how different gender identities interact with mental health.

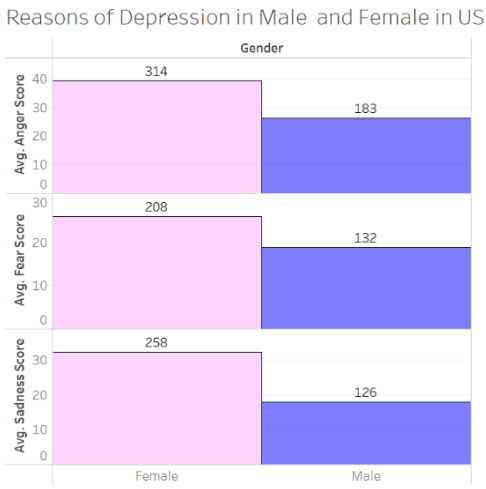


Visualization of our data consistently reveals a clear trend — women consistently report higher levels of anxiety and depression symptoms compared to men. This statistical consistency reinforces the reliability of our hypothesis and emphasizes the importance of examining gender disparities in mental health.

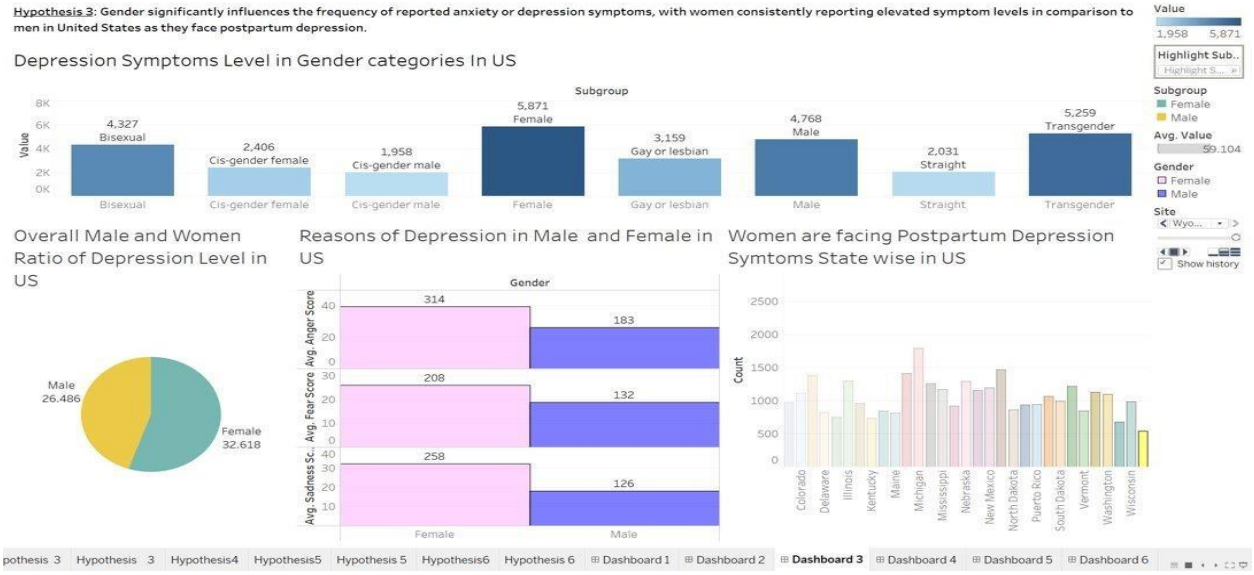


The gender disparity in reported mental health symptoms is a complex phenomenon with multifaceted explanations. Our analysis points towards factors such as postpartum symptoms, anger levels, societal expectations, and biological influences. Graphical representations depict the intricate interplay of these factors, underlining the need for a holistic approach to understanding mental health in different gender groups.



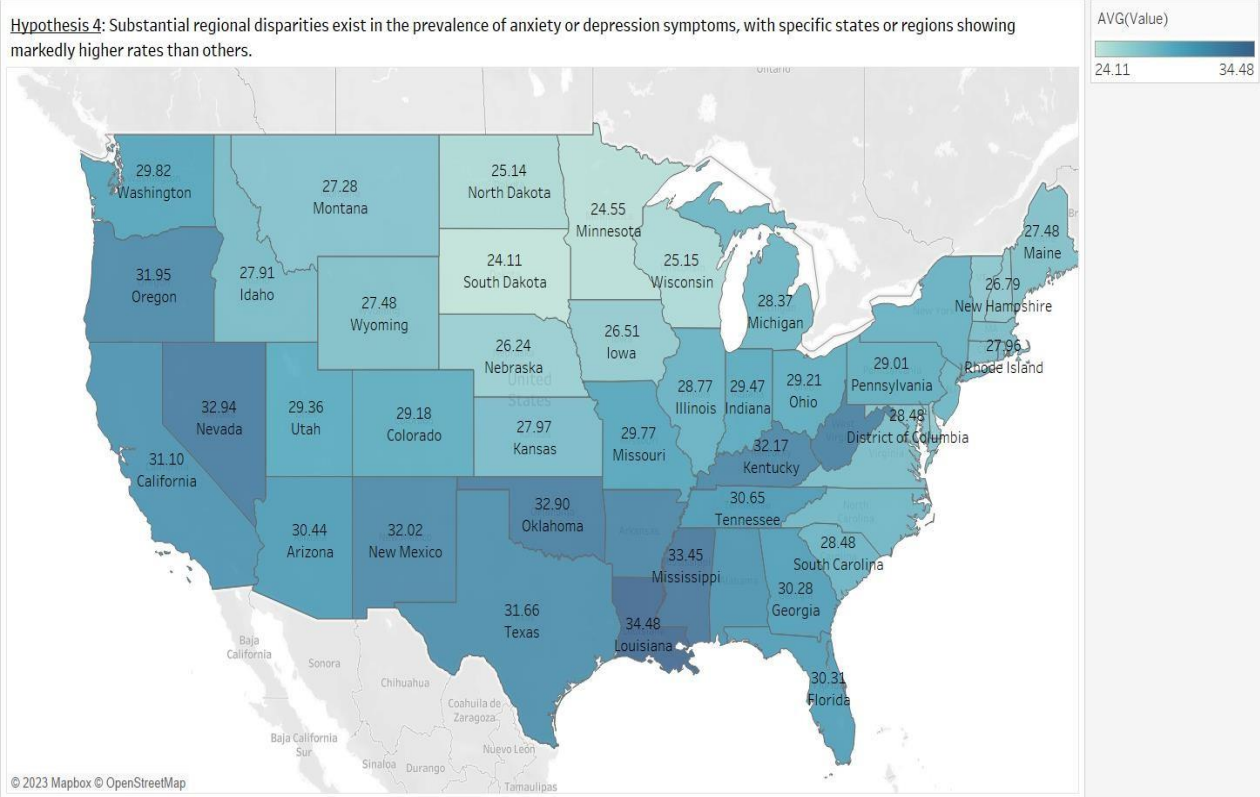


Recognizing the gender-based differences in mental health symptoms is crucial for developing effective mental health policies and interventions. Tailoring support systems to meet the specific needs of different gender groups is imperative for achieving better outcomes and a more equitable distribution of mental health resources. This understanding can inform targeted interventions that address the unique challenges faced by individuals based on their gender identity.



4. Substantial regional disparities exist in the prevalence of anxiety or depression symptoms, with specific states or regions showing markedly higher rates than others.

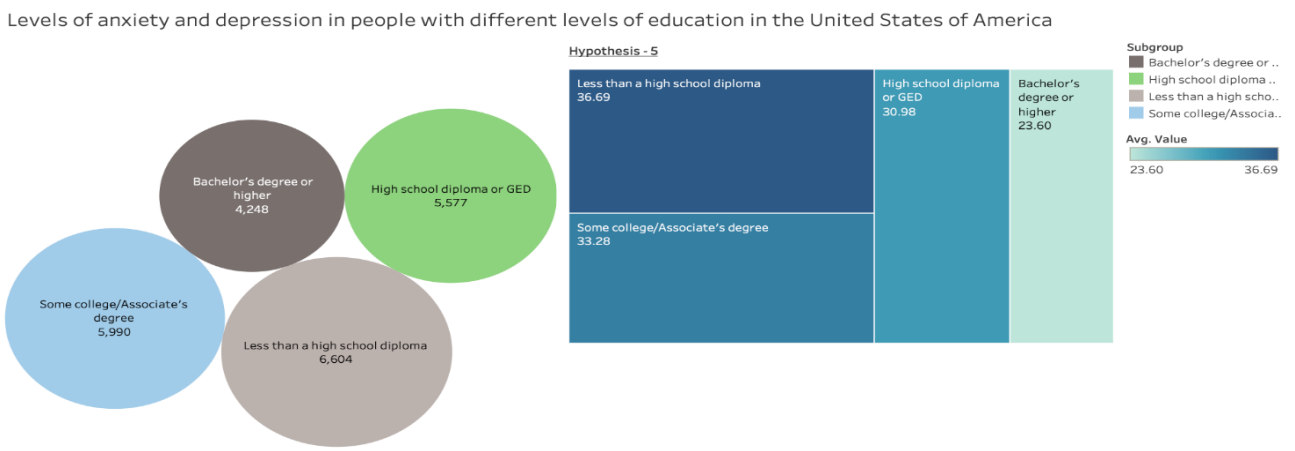
The hypothesis states that there is a significant difference in the number of people who experience anxiety or depression symptoms across different states or regions.
The map shows the average value of depression for each state in the US. The colors on the map represent the level of depression, The darker color indicates higher values.



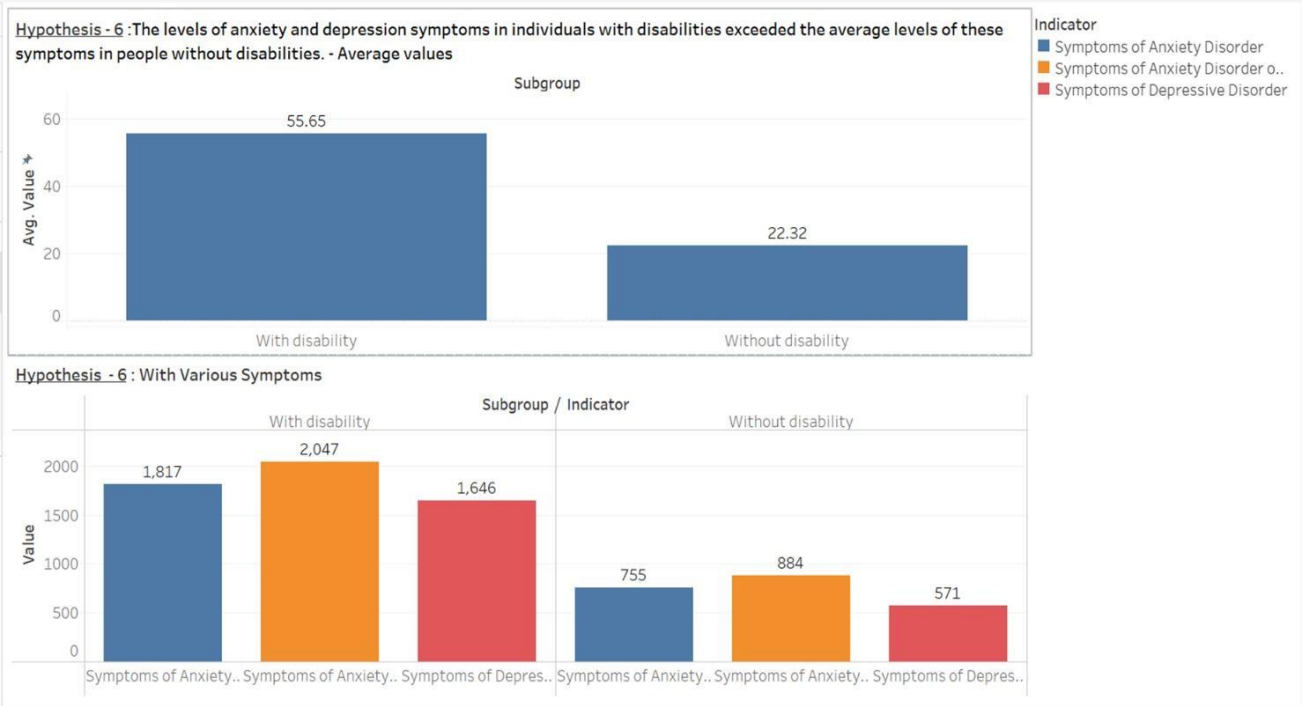
The highest rates are found in the Southern and Appalachian regions, with states like Mississippi, Louisiana, and West Virginia having rates over 30%. The lowest rates are found in the Midwest and Rocky Mountain regions, with states like North Dakota, Wyoming, and Colorado having rates below 25%. There is a significant variation in the percentage of adults with anxiety or depression symptoms across the United States. So, the hypothesis is true. The reasons for this variation are not fully understood, but it may be due to factors such as socioeconomic status, access to healthcare, and cultural factors.

5. Individuals with a bachelor's degree or higher often exhibit better mental health in the United States due to factors such as increased access to resources, improved coping skills, and reduced stigma surrounding mental health issues.

In this dashboard, the bubble chart represents the sum of levels of low and high confidence intervals. The higher the value, the greater the variability in responses. The tree map, on the other hand, illustrates the average values of anxiety and depression disorders. It's evident that 'less than a high school diploma' demonstrates the highest average value of 36.69, while 'bachelor's degree or higher' shows the lowest average value of 23.60. This implies that individuals with the highest education have lower levels of symptoms.



6. The levels of anxiety and depression symptoms in individuals with disabilities exceeded the average levels of these symptoms in people without disabilities



The first graph shows that individuals with disabilities have higher levels of anxiety and depression symptoms than individuals without disabilities. The average level of anxiety symptoms in individuals with disabilities is 55.65, while the average level of anxiety symptoms in individuals without disabilities is 22.32. The average level of depression symptoms in individuals with disabilities is 2000, while the average level of depression symptoms in individuals without

disabilities is 884. Individuals with disabilities have higher levels of anxiety and depression symptoms than individuals without disabilities.

The second graph shows that individuals with disabilities have higher levels of anxiety and depression symptoms across all subgroups. The average level of anxiety symptoms in individuals with disabilities ranges from 1500 to 2047, while the average level of anxiety symptoms in individuals without disabilities ranges from 755 to 884. The average level of depression symptoms in individuals with disabilities ranges from 1646 to 1817, while the average level of depression symptoms in individuals without disabilities ranges from 571 to 755. Individuals with disabilities have higher levels of anxiety and depression symptoms across all subgroups.

Overall, the data suggests that individuals with disabilities have a higher risk of developing anxiety and depression symptoms than individuals without disabilities. This is likely due to several factors, including the challenges of living with a disability, the stigma associated with disability, and the lack of access to appropriate mental health care. Individuals with disabilities have a higher risk of developing anxiety and depression symptoms than individuals without disabilities.

Yes, the hypothesis given is true for both anxiety and depression symptoms.
For anxiety symptoms, the P-value is 0.023, which is less than 0.05. This means that there is a significant difference between the mean anxiety symptoms of individuals with disabilities and individuals without disabilities. Individuals with disabilities have a higher mean anxiety symptom score (44.36) than individuals without disabilities (18.99).

Conclusion

1. In conclusion, the 1st Hypothesis holds true Changes in the frequency of reported anxiety or depression symptoms are connected to the time of the COVID-19 pandemic (e.g., early vs. later months).
2. In conclusion, the 2nd hypothesis considered holds true. This may be attributed to the lack of experience and exposure in younger individuals compared to their older counterparts, who are likely to have encountered a broader range of life experiences.
3. In conclusion, our hypothesis is supported by current research findings, affirming that gender significantly influences the frequency of reported anxiety or depression symptoms. The consistently elevated levels reported by women compared to men highlight the need for gender-specific mental health strategies. Acknowledging and addressing these gender-based differences is the first step towards fostering more effective mental health policies and interventions.
4. In conclusion, the 4th hypothesis shows there is a range of differences in the values across the states. Suggesting that there is a substation disparity in the prevalence of anxiety or depression symptoms. Which means the hypothesis is true. This could

happen due to the variety of factors such as socioeconomic status, poverty, lack of healthcare and unemployment.

5. In conclusion, the 5th hypothesis holds true. This can be attributed to the fact that people with higher education can have greater awareness of and access to mental health resources, which, in turn, can assist them in coping with anxiety and depression more effectively than individuals with lower levels of education.
6. With this we can conclude that this tableau visualization confirms the hypothesis that the levels of anxiety and depression symptoms in individuals with disabilities exceed the average levels of these symptoms in people without disabilities.