Clin Schizophr Relat Psychoses
Volume 18:2, 2024
Doi: 10.3371/CSRP.XLXL.123124

Clinical Schizophrenia & Related Psychoses

Research Article

Open Access

The Impact of the Symptoms of Anxiety and Depressive Disorders on American Householders during COVID-19 Pandemic: A Group and Subgroup-Based Cohort Study

Liming Xie*, Xin Li

Department of Mathematics, University of Houston, Houston, USA

Abstract

This study examines trends in depressive symptoms across various age groups and demographic subgroups from 2021 to 2024. Analysis reveals a cyclical pattern of depressive symptoms with peaks and troughs, showing a decline toward late 2023 and 2024, suggesting potential recovery or intervention effects. It highlights significant variability in depressive symptoms during phase 3.1, particularly among younger adults (18-29 years), indicating possible external influences. Some show fluctuating trends with a sharp decline towards the series end, possibly reflecting seasonal effects. It illustrates higher symptom prevalence in younger groups and those with lower education or disabilities. Some charts confirm a general decline in symptoms across most subgroups, with significant differences based on age, gender, and education. Additionally, it shows stable geographic trends with minor fluctuations, and identifies statistically significant subgroup differences, guiding targeted mental health interventions.

Keywords: Anxiety • Depression • Mental health • COVID-19 • Socioeconomic

Introduction

Depressive disorders represent a significant public health challenge, affecting millions of individuals globally. The World Health Organization (WHO) estimates that depression is the leading cause of disability worldwide, and its prevalence continues to rise, particularly in the aftermath of the COVID-19 pandemic [1]. Understanding the demographic and socioeconomic factors associated with depressive symptoms is important for developing targeted interventions and public health strategies aimed at reducing the burden of depression across diverse populations. Mental health is influenced by a complex interplay of biological, psychological, and social factors [2-5]. Research has consistently shown that certain demographic groups, such as younger adults, females, and individuals with lower socioeconomic status, are at higher risk for developing depressive symptoms [6-9]. However, recent societal shifts, including increased awareness of mental health issues, changes in healthcare accessibility, and the evolving cultural landscape, necessitate ongoing investigation into how depressive symptoms manifest across different subgroups over time [10-13].

This paper examines trends in depressive symptoms across various demographic subgroups in the United States from 2021 to 2024, using data from a national survey. By analysing trends in depressive symptoms across different age groups, genders, racial/ethnic categories, educational attainment levels, disability statuses, and geographic regions, this study aims to identify the subgroups most at risk for depression and explore potential factors contributing to observed disparities. Particularly, this study places a strong emphasis on high-risk populations such as transgender individuals, those with disabilities, and individuals with lower educational attainment, as previous research has indicated these groups experience significant mental health challenges [14-21]. The analysis also considers how geographic factors and state-level policies might contribute to variations in depressive symptoms, reflecting the importance of contextual influences on mental health. The findings presented in this paper have significant implications for public health policy and mental health intervention strategies.

Materials and Methods

Data

We used data from CDC in the U.S. that includes 5 federal agencies, survey, named the household pulse so that we test the influence of the COVID-19 pandemic on American employment status, consumer spending, food security, housing, education disruptions and dimensions of mental health.

Statistical analysis

Initially used the baseline characteristics to summarize demographic and baseline characteristics of the study objects. Also, we simplify analyzed group, subgroup, and estimate value by indicator. All analysis data were adjusted based on data collection time periods. After that, we analyzed some important links of estimate value with phase, indicator, group, and subgroup by applying ggplot2 to create a graphic and to combine some components and to add layers of phase, indicator, group, or subgroup so that we obtain the aesthetic properties.

HSD test

This is a post-hoc test used to find significant differences between group means after conducting an ANOVA (Analysis Of Variance). It is particularly useful when you have multiple groups and want to compare all possible pairs of means [22,23]. The formula is:

$$HSD = q\sqrt{\frac{MSE}{n}},$$

Where q is the studentized range statistic, which depends on the

***Corresponding Author:** Liming Xie, Department of Mathematics, University of Houston, Houston, USA, E-mail: limingxie2018@gmail.com*

***Copyright:** © 2024 Xie L, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*

Received: 29-Nov-2024, Manuscript No. CSRP-24-155605; **Editor assigned:** 02-Dec-2024, PreQC No. CSRP-24-155605 (PQ); **Reviewed:** 17-Dec-2024, QC No. CSRP-24-155605; **Revised:** 24-Dec-2024, Manuscript No. CSRP-24-155605 (R); **Published:** 31-Dec-2024, DOI: 10.3371/CSRP.XLXL.123124

number of groups and the degrees of freedom for the error term. MSE is the Mean Square Error (within-group variance) obtained from the ANOVA. n is the number of observations in each group (assuming equal sample sizes). If the difference between two group means is larger than the HSD value, we conclude that these two groups have significantly different means [24]. If the difference is smaller than the HSD value, the means are not significantly different. The analysis revealed a general trend of fluctuating depressive symptoms across the study period, with some subgroups showing significant spikes in prevalence during specific years. Younger adults, individuals identifying as transgender, and those with lower educational attainment exhibited consistently higher levels of depressive symptoms. In contrast, older adults and those with higher educational attainment generally reported lower levels of depressive symptoms. Tukey's HSD test identified numerous significant differences between subgroups.

Data availability

Data set for this study is available from

https://data.cdc.gov/w/8pt5-q6wp/tdwk-ruhb?cur=Z72qzvpv4NA&from=MtkW7ecXseK.

Code availability

This study was performed by R version 4.4.1 (2024-06-14), it can be available upon request.

Results

Significant variations in anxiety levels across different subgroups

In Figure 1, transgender individuals show the highest mean percentage of anxiety, with a "High, Declining" trend. The high percentage indicates a significant mental health burden within this group, although the declining trend suggests some improvement. Individuals with disabilities also shows high anxiety levels with a "Moderate, Fluctuating" trend, indicating persistent anxiety issues with some variability over time. Anxiety levels for bisexual group are relatively high and fluctuate, marked by a "Moderate, Fluctuating" trend, indicating that this group is also at higher risk for anxiety. The group for young adults (18-29 years) shows higher anxiety levels with a "Moderate, Fluctuating" trend, highlighting them as a vulnerable group with variable anxiety trends. For Older adults (70-79 years and 80+ years) display the lowest anxiety levels with a "low, stable" trend, indicating minimal fluctuations and generally lower anxiety prevalence. Individuals with lower educational attainment for less than high school diploma show higher anxiety levels with a "Moderate, Fluctuating" trend, indicating greater mental health challenges within this group. This group with bachelor's degree or higher shows lower anxiety levels with a "Low, Stable" trend, reflecting better mental health outcomes among more educated individuals. This group of gay or lesbian individuals has moderate anxiety levels with fluctuating trends, like bisexual individuals, indicating higher mental health concerns. Straight group has relatively low anxiety levels with a "low, stable" trend, representing a more stable and lower prevalence of anxiety.

Cyclical patterns and age-related differences in depressive symptoms over time

In Figure 2a, the data shows significant fluctuations in depressive symptoms across all age groups over the time period. The general trend seems to be a cyclical pattern with visible peaks and troughs, potentially indicating seasonal variation or responses to external events. Also, it appears in decline towards 2024: Toward the end of the series (late 2023 and into 2024), there appears to be a decline in depressive symptoms across all age groups. We can find that there is higher prevalence in younger age groups: Younger age groups (18-29 years, 30-39 years) consistently show higher percentages of depressive symptoms compared to older groups. The lines for these younger groups are often positioned higher on the y-axis (percentage of depressive symptoms) than the lines representing older groups. Lower Prevalence in Older Age Groups: Older age groups, particularly those 70 years and above, tend to have lower percentages of reported depressive symptoms. So, younger groups likely have higher means and potentially higher variability. The percentage values on the y-axis represent the prevalence of depressive symptoms within each age group at various points in time. The higher percentages in younger age groups suggest a higher burden of depressive symptoms in these populations. Incidence: While the data appears to represent prevalence (existing cases), understanding changes over time could also provide insights into the incidence of new cases.

In Figure 2b, phase 3.1 is a visible divergence among age groups, indicating significant variation. The other phases display closely grouped lines, suggesting minimal differences in depressive symptoms among the age groups. The trend appears stable for most phases, with percentages clustered around certain values. The exception is phase 3.1, where the variability between age groups increases. Phase 3.1 that the most pronounced variability occurs in this phase, where age groups show different trajectories of depressive symptoms.

Young adults (18-29): They appear to have higher percentages of depressive symptoms during this phase.

Older adults (50-79): These age groups seem to have more stable and lower percentages.

Other phases: The depressive symptoms percentages for different age groups are closely aligned, indicating little variation between groups in these phases.

Thus, for Phase 3.1 shows a notable change in depressive symptoms across age groups compared to other phases, indicating potential external factors influencing depressive symptoms during this period. Additionally, stability in Other Phases: The lack of significant variability in other phases suggests that depressive symptoms either stabilized or that the impact of any external factors affected all age groups similarly. Epidemiologically, younger adults (18-29 years) may represent a high-risk group during certain periods (e.g., phase 3.1), as they seem to exhibit higher levels of depressive symptoms compared to older adults.

The plot in Figure 2c shows a fluctuating trend in depressive symptoms over time, with some periods of increase and others of decline. The initial phase shows a rise in depressive symptoms, peaking around the middle of the series, followed by a gradual decline with some fluctuations. Towards the end of the time series, there is a sharp drop in depressive symptoms, falling below 20%. This sharp decline could be significant and warrants further investigation. The graph exhibits periodic fluctuations, suggesting the presence of seasonality or cyclic patterns in depressive symptoms. (1) Peaks in depressive symptoms might correspond to periods of increased stress, such as winter months, holidays, or specific socio-economic events; (2) Troughs could correspond to periods with potentially lower stress levels, such as summer months or times of economic stability. For error bars, indicating the variability or uncertainty in the reported percentages. The variability is relatively consistent throughout the time series, though it appears to slightly reduce during periods of decline in depressive symptoms.

Variability in anxiety and depressive symptoms across demographics: Insights from 2021-2024 trends

Now we find that in Figure 3, the lines in each graph show fluctuating trends in the prevalence of symptoms, with some groups consistently showing higher percentages than others. The pink line, representing one of the subgroups, consistently remains at the highest level across all three indicators, this subgroup experiences the highest prevalence of both anxiety and depressive symptoms. The prevalence of symptoms shows significant variation over the observed period (2021-2024), indicating that the prevalence rates have not remained stable. Peaks and troughs could be indicative of external factors or interventions impacting mental health

at different points in time. In age-related patterns age groups such as 18-29 years and 30-39 years (presumed from the color codes) may exhibit higher symptom percentages, suggesting younger populations are more affected by anxiety and depressive disorders. Education level, represented by different color codes, shows varying prevalence, potentially highlighting the role of education and associated socioeconomic status in mental health outcomes. Subgroups related to gender identity and sexual orientation may show distinct patterns, possibly indicating the impact of social stigma, discrimination, and lack of support on mental health within these communities. Groups with and without disabilities might exhibit different trends, reflecting how physical or cognitive disabilities could exacerbate or coincide with mental health challenges. Endemiological, the time series analysis shows that a significant portion of the population experiences anxiety and depressive symptoms, suggesting a high prevalence of these conditions across multiple demographics.

Trends and disparities in depressive symptoms: Analysis by subgroup, education, and disability status

In Figure 4, first take general trend overview that from 2021 to 2024, there is a general decline in the percentage of people reporting depressive symptoms across most subgroups. This indicates improvements in mental health awareness, access to mental health services, or changes in societal conditions. Second, the rate of decline varies by subgroup, suggesting that different factors may be influencing mental health outcomes across these groups. Also, for 18-29 years, consistently reports higher depressive symptoms, with levels around 40% to 45%. Although there is a slight decline over time, they remain among the highest across all age groups. In 70-79 years and 80+ years, these groups report the lowest levels of depressive symptoms, with percentages often below 20%. Older adults have better coping mechanisms or that different life stressors affect younger adults more. Transgender Individuals: This subgroup reports the highest levels of depressive symptoms, often exceeding 50%. This highlights significant mental health challenges faced by transgender individuals. For Cis-gender Females vs. Males: Cis-gender females report higher levels of depressive symptoms than cis-gender males, which aligns with existing research showing that females are more likely to experience depression. In Race/Ethnicity: Non-Hispanic Black and White: These groups show similar trends, with depressive symptoms hovering around 30%-35%. Non-Hispanic Asian individuals report slightly lower levels, indicating potential cultural or community support differences. Other Races: This group shows variability, which may reflect the diverse experiences within this category. On the other hand, Educational Attainment: Less than High School Diploma: Individuals in this group report higher depressive symptoms compared to those with higher education levels, indicating the potential impact of socioeconomic factors on mental health. Bachelor's Degree or Higher: This subgroup reports the lowest levels of depressive symptoms. Disability Status: The group with disability reports some of the highest levels of depressive symptoms, close to 50%, underscoring the significant mental health burden faced by people with disabilities. For Without Disability: Reports lower levels, often below 30%, suggesting better mental health outcomes for those without disabilities. In geographic trends some states like Utah, Tennessee, and Texas report higher depressive symptoms, often around or above 40%.

Consistent patterns and minor variations in depressive symptoms across demographics

Additionally, most lines in Figure 5 appear relatively stable over time, indicating that the percentage of individuals experiencing symptoms of depressive disorder remains consistent within each subgroup. However, there are slight fluctuations indicating possible seasonality or responses to external events. But Lack of Large Peaks or Troughs: The absence of sharp spikes or drops suggests that there were no major public health interventions or large-scale stressors that dramatically altered the depressive symptoms prevalence in most subgroups during this period. In the trends across age groups, such as 18-29 years, 30-39 years, appear to be relatively close together, indicating that age might not be a dominant factor in the fluctuation of depressive symptoms over time. Younger age groups (like 18-29 years) might show slightly higher levels of depressive symptoms, which aligns with existing literature that younger adults often report higher levels of depression. For gender and sexual orientation, there might be a higher baseline level of depressive symptoms reported by subgroups like "Transgender" and "Bisexual," which is consistent with research showing higher rates of mental health challenges in these populations. "Cis-gender female" and "Cis-gender male" groups might have more similar trends, possibly indicating less variation based on gender in this dataset. The subgroup lines for racial categories such as "Non-Hispanic Black," "Non-Hispanic White," and "Hispanic or Latino" appear to be stable, indicating consistent reporting across these groups. The small differences in trends might reflect the impact of social determinants of health on depressive symptoms, with racial and ethnic minorities often facing more significant challenges. For educational levels, “Less than a high school diploma" and "bachelor’s degree or higher" lines seem to indicate that education level might have some impact on the prevalence of depressive symptoms, with those with lower educational attainment possibly showing slightly higher rates. "With disability" subgroup might show a higher baseline of depressive symptoms compared to "Without disability," which is consistent with evidence that individuals with disabilities often face more mental health challenges. Epidemiologically, depressive symptoms have been persistent issues across all subgroups over the years, with little change in prevalence.

Post-hoc analysis of subgroup differences: Significant mean differences and confidence intervals from Tukey HSD test

To further study in data, we make Figure 6. That is Tukey HSD (Honestly Significant Difference) test, which is commonly used in post-hoc analysis after an ANOVA to determine which specific groups' means are different. X-Axis (Difference in Means represents the difference in means between the compared subgroups. A value of 0 would indicate no difference in means between the two groups being compared. Y-Axis (Subgroup Comparisons): Each line on the y-axis represents a pairwise comparison between two subgroups. For example, comparing the incidence rate of a disease between "Non-Hispanic White" and "Non-Hispanic Black" populations. Confidence Intervals: Each point on the plot represents the difference in means between two groups, and the lines extending from the points are confidence intervals (usually 95%). If the confidence interval crosses 0, it suggests that there is no statistically significant difference between the two subgroups. Comparisons where the confidence intervals do not cross 0 indicate statistically significant differences between the groups. These differences are what the Tukey HSD test flags as being "honestly" significant, meaning they are likely not due to random chance. For Significant Comparisons: The main focus should be on comparisons where the confidence intervals do not cross zero. These comparisons indicate that there are significant differences in the means between those subgroups.

Discussion

For older adults, interventions might include increased social support, mental health counselling, and programs aimed at reducing isolation. For younger and middle-aged adults, efforts could focus on stress management, work-life balance, and support during life transitions [25-28].

Moving forward, it is important to integrate mental health into public health planning, particularly in response to external stressors such as pandemics and economic instability. By understanding and addressing the unique mental health needs of different age groups, we can work towards a healthier, more resilient population [29-31].

The analysis of depressive symptoms across various demographic groups reveals both consistent and variable trends over time. This analysis in Figure 1, reveals significant variations in anxiety levels across

different subgroups, with certain groups experiencing higher and more variable anxiety levels. Public health strategies should focus on targeted interventions for high-risk groups, including transgender individuals, those with disabilities, and younger adults, as well as region-specific approaches to address geographical disparities. Figure 2, highlights a general decline in depressive symptoms towards 2024, although younger adults and individuals with disabilities continue to experience higher levels of depressive symptoms. Figure 3, indicates significant variability across subgroups, with transgender individuals and those with lower educational attainment showing particularly high levels. Figure 4, confirms the overall decline but notes persistent high rates among specific subgroups. Figure 5, illustrates stability with minor fluctuations in depressive symptoms, suggesting sensitivity to external factors. Figure 6, Tukey HSD test identifies statistically significant differences in depressive symptoms between certain subgroups, emphasizing the need for targeted interventions.

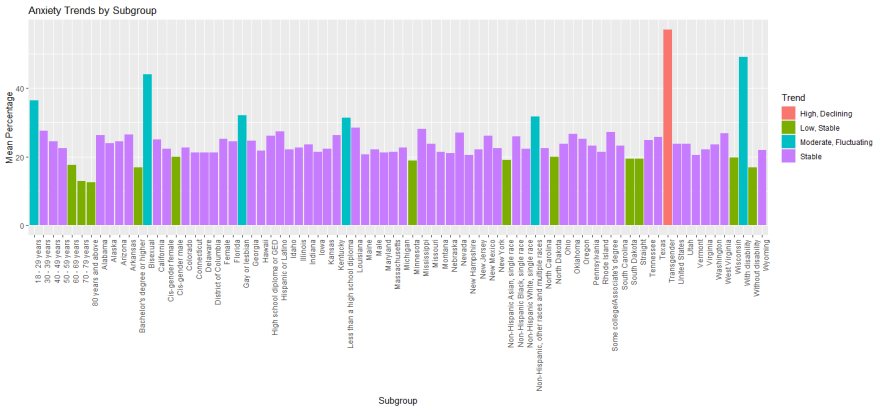

Figure 1. The trends in anxiety levels by various subgroups over the time period of 2021-2024.

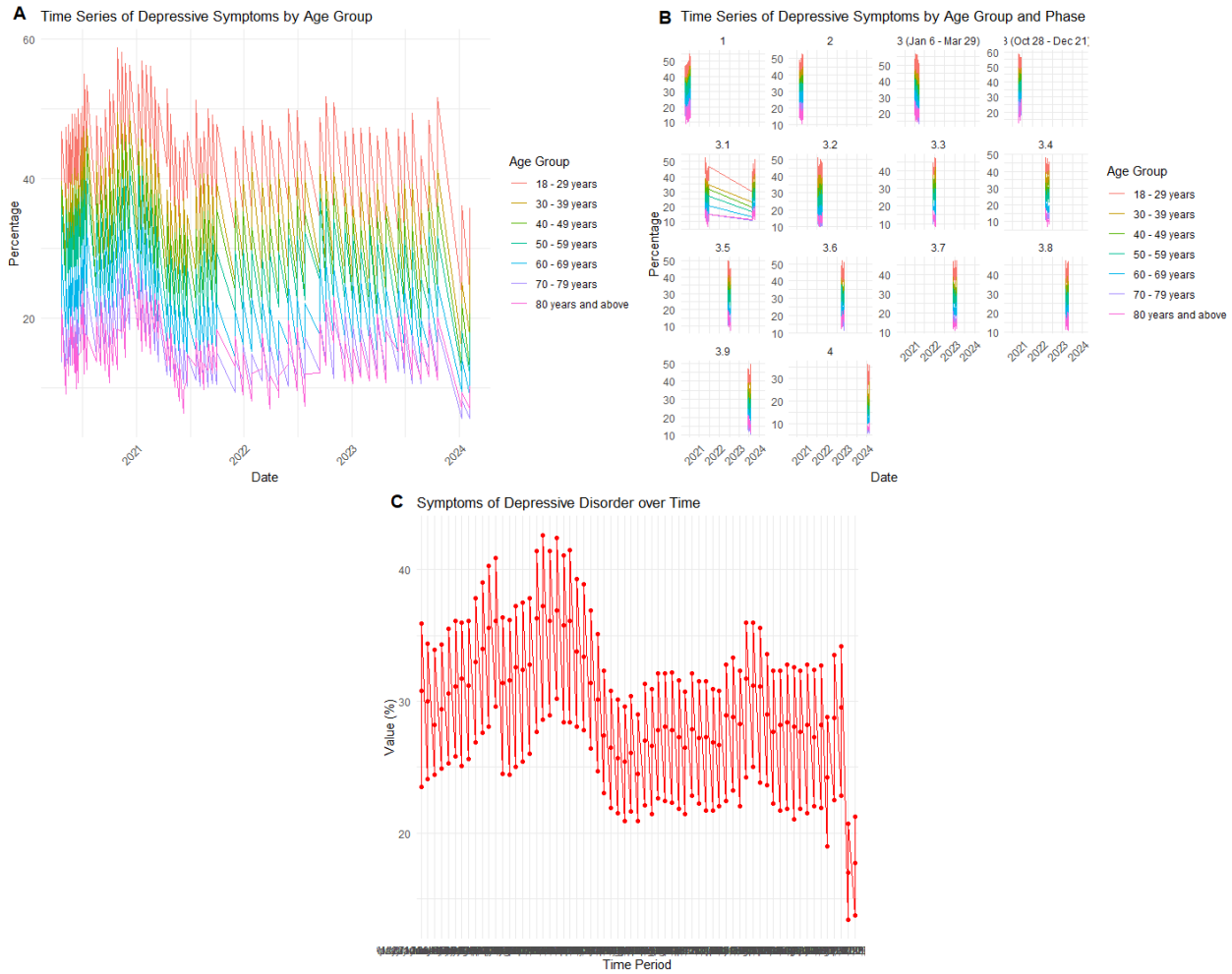

Figure 2. Display of time series of depressive symptoms. Note: (a) The time series of depressive symptoms by age group from 2021 to 2024. The x-axis represents the dates, while the y-axis shows the percentage of people reporting depressive symptoms. The data is broken down by age groups, with each colour representing a different age group; (b) The series of small multiples (time series plots) showing the percentage of depressive symptoms across different age groups over time. The panels are labelled in a sequence (1, 2, 3.1, 3.2, etc.). Each plot shows a set of lines representing different age groups. The y-axis represents the percentage of depressive symptoms, ranging from 10% to 50%, while the x-axis spans from 2021 to 2024; (c) The percentage of people reporting symptoms of depressive disorder over time. The y-axis represents the percentage (Value %) of people with depressive symptoms, ranging from 20% to 50%. The x-axis represents the time periods over which these percentages were recorded.

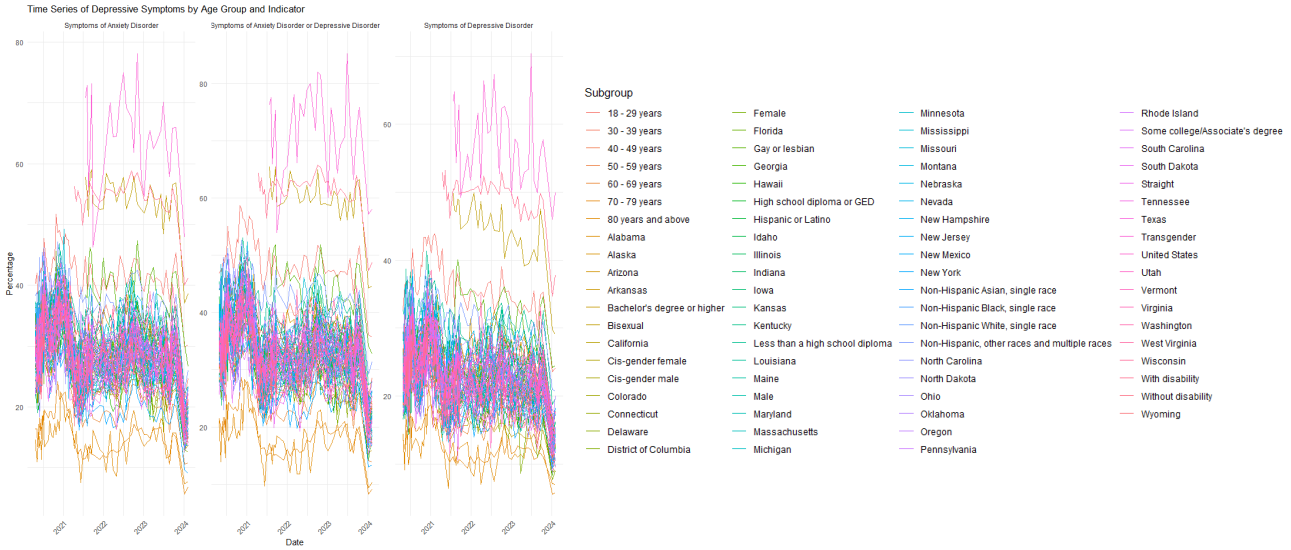

Figure 3. Time series analysis of depressive and anxiety symptoms across various demographic subgroups.

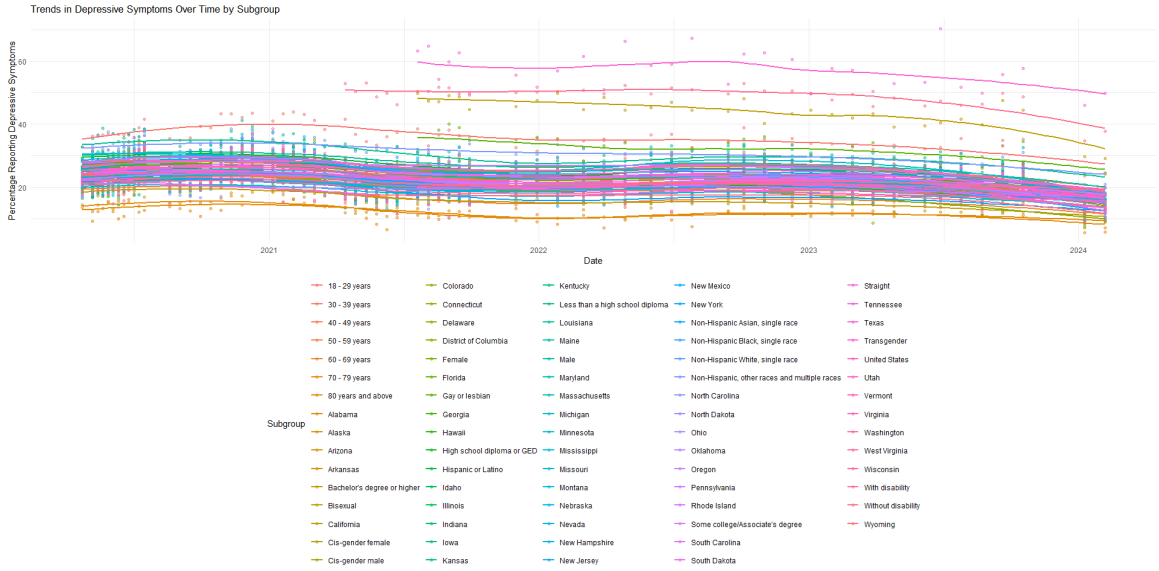

Figure 4. The trends in depressive symptoms over time, segmented by various subgroups.

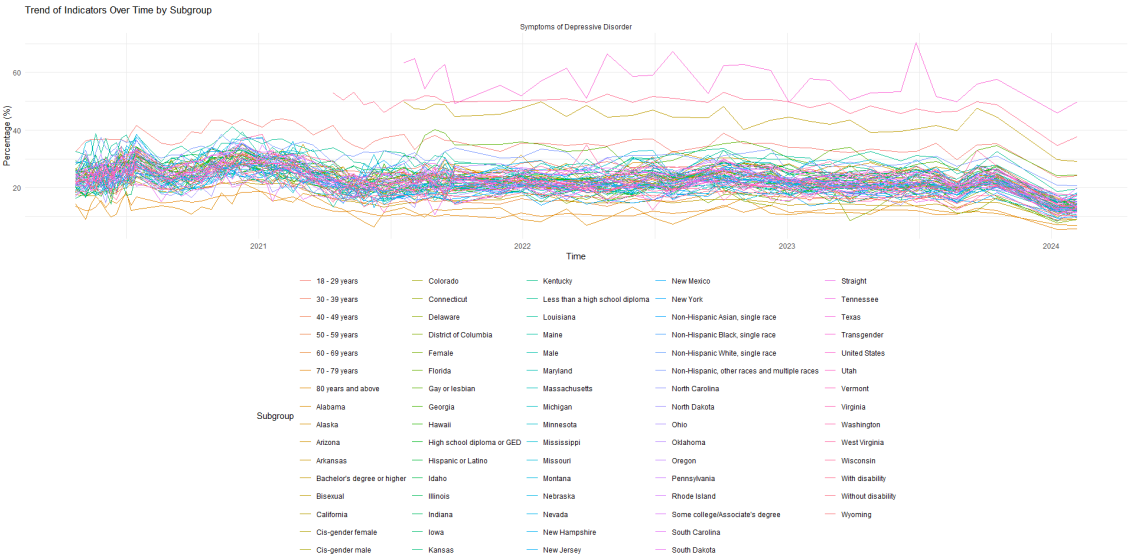

Figure 5. Complex, multi-variable time-series chart tracking the trend of symptoms of depressive disorder across various demographic and geographic subgroups from 2021 to 2024.

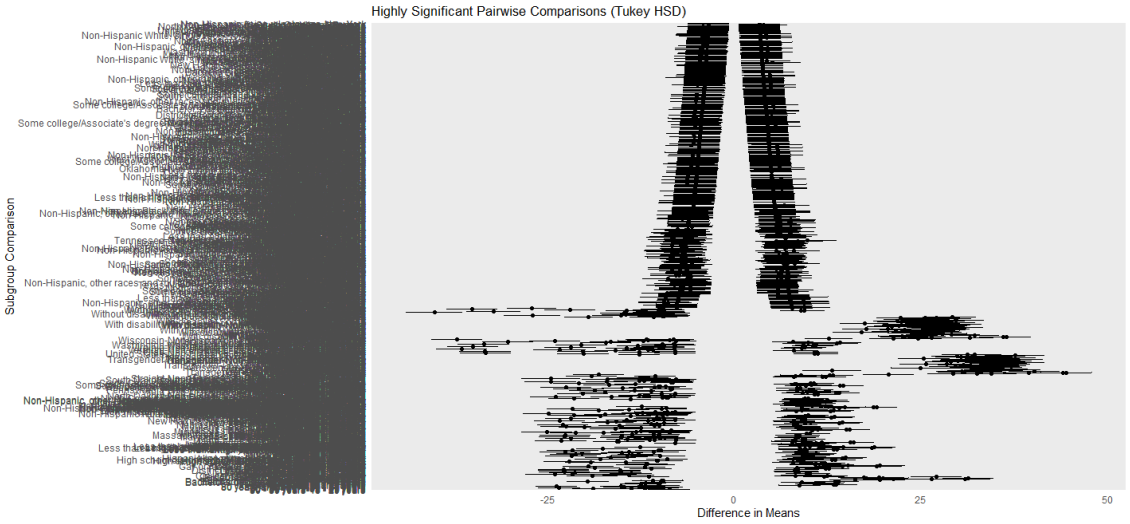

Figure 6. The visualization of a Tukey HSD (Honestly Significant Difference) test, which shows the pairwise comparisons of different subgroups, with the x-axis representing the difference in means between the groups, and the y-axis listing the specific subgroup comparisons.

To address the mental health challenges faced by older adults, interventions should focus on enhancing social support, mental health counselling, and reducing isolation. Programs designed to foster social connections and provide mental health resources are important for mitigating the effects of loneliness and chronic health issues in this population.

For younger adults (18-29 years), interventions should target stress management, economic support, and resources to navigate life transitions. Programs aimed at improving work-life balance and providing support for economic pressures, such as student debt, are essential. Middle-aged adults (30-59 years) might benefit from stress management and mental health support tailored to their unique life stage challenges.

Integrating mental health considerations into public health planning is essential, especially in response to external stressors such as pandemics and economic instability. Understanding the specific mental health needs of different age groups and subgroups allows for more effective public health strategies and promotes resilience in the population.

Psychologically, the group's consistently high levels of depressive symptoms for young adults (18-29 years) can be attributed to life transitions, social media influences, and economic pressures. Addressing these factors through targeted support and interventions is important for reducing depressive symptoms in this age group. While older adults generally report lower levels of depressive symptoms, the oldest age group (80+ years) shows higher levels of anxiety and depression, likely related to chronic health issues. Interventions should consider the specific mental health challenges faced by this group. Higher depressive symptoms among transgender individuals and those with lower educational attainment reflect the impact of discrimination and socio-economic challenges. Customized interventions to address minority stress and provide accessible mental health resources are needed.

Also, the fluctuations observed in depressive symptoms across different phases may correspond to specific external stressors or events, such as economic shifts or public health crises. Understanding these variations can inform targeted interventions during high-stress periods and support recovery phases.

Conclusion

The Tukey HSD test highlights significant differences in depressive symptoms among various subgroups. The intersectionality of factors such as race, gender, and education level reveal complex patterns in mental health disparities. Targeted mental health services should address these intersections to effectively support the most vulnerable populations.

In sum, this study underscores the complexity of depressive symptoms across different demographic and socio-economic groups. By focusing on tailored interventions and integrating mental health considerations into public health planning, we can address the specific needs of various groups and work towards a more resilient and mentally healthy population.

Author Contributions

The author developed and designed the study concept, wrote the paper and approved the final version of the paper for submission.

References

1. COVID-19 Pandemic Triggers 25% Increase in Prevalence of Anxiety and Depression Worldwide. *WHO* (2022).
2. Kirkbride, James B, Deidre M Anglin, Ian Colman and Jennifer Dykxhoorn, et al. "The Social Determinants of Mental Health and Disorder: Evidence, Prevention and Recommendations." *World Psychiatry* 23 (2024): 58-90.
3. Freeman, Melvyn. "The World Mental Health Report: Transforming Mental Health for All." *World Psychiatry* 3 (2022): 391-392.
4. Kambeitz-Ilankovic, Lana, Nikolaos Koutsouleris and Rachel Upthegrove. "The Potential of Precision Psychiatry: What is in Reach?." *Br J Psychiatry* 220 (2022): 175-178.
5. Craig, Ashleigh, Tamsen Rochat, Sara N Naicker and Witness Mapanga, et al. "The Prevalence of Probable Depression and Probable Anxiety, and Associations with Adverse Childhood Experiences and Socio-Demographics: A National Survey in South Africa." *Front Public Health* 10 (2022): 986531.
6. Salk, Rachel H, Janet S Hyde and Lyn Y Abramson. "Gender Differences in Depression in Representative National Samples: Meta-Analyses of Diagnoses and Symptoms." *Psychol Bull* 143 (2017): 783-822.
7. Anguzu, Ronald, Sneha Nagavally, Aprill Z Dawson and Rebekah J Walker, et al. "Age and Gender Differences in Trends and Impact of Depression on Quality of Life in the United States, 2008 to 2016." *Womens Health Issues* 31 (2021): 353-365.
8. Brody, Debra J, Laura A Pratt and Jeffery P Hughes. "Prevalence of Depression among Adults Aged 20 and Over: United States, 2013-2016." *NCHS Data Brief* (2018): 1-8.
9. Breslau, J, SE Gilman, BD Stein and T Ruder, et al. "Sex Differences in Recent First-Onset Depression in an Epidemiological Sample of Adolescents." *Transl Psychiatry* 7 (2017): e1139.

10. Bitsko, Rebecca H. "Mental Health Surveillance among Children-United States, 2013–2019." *MMWR Suppl* 71 (2022).
11. Errazuriz, Antonia, Dalia Avello-Vega, Juan P Ramirez-Mahaluf and Rafael Torres, et al. "Prevalence of Depressive Disorder in the Adult Population of Latin America: A Systematic Review and Meta-Analysis." *Lancet Reg Health Am* 26 (2023): 100587.
12. Luna, Eliazar, Hynek Pikhart and Anne Peasey. "Association between Depressive Symptoms and All-Cause Mortality in Chilean Adult Population: Prospective Results from Two National Health Surveys." *Soc Psychiatry Psychiatr Epidemiol* 59 (2024): 1003-1012.
13. Dell'Osso, Bernardo, Rita Cafaro, and Terence A. Ketter. "Has Bipolar Disorder become a Predominantly Female Gender Related Condition? Analysis of Recently Published Large Sample Studies." *Int J Bipolar Disord* 9 (2021): 3.
14. Smith-Johnson, Madeline. "Transgender Adults have Higher Rates of Disability than their Cisgender Counterparts: Study Examines Rates of Disability among Transgender Adults and Cisgender Adults." *Health Aff (Millwood)* 41 (2022): 1470-1476.
15. Mulcahy, Abigail, Carl G Streed Jr, Anna Marie Wallisch and Katie Batza, et al. "Gender Identity, Disability, and Unmet Healthcare Needs among Disabled People Living in the Community in the United States." *Int J Environ Res Public Health* 19 (2022): 2588.
16. Goldsen, Karen I Fredriksen, Meghan Romanelli, Charles P Hoy-Ellis and Hailey Jung. "Health, Economic and Social Disparities among Transgender Women, Transgender Men and Transgender Nonbinary Adults: Results from a Population-Based Study." *Prev Med* 156 (2022): 106988.
17. Jimenez, Daniel E, Stephen J Bartels, Veronica Cardenas and Margarita Alegría. "Stigmatizing Attitudes toward Mental Illness among Racial/Ethnic Older Adults in Primary Care." *Int J Geriatr Psychiatry* 28 (2013): 1061-1068.
18. Jimenez, Daniel E, Stephen J Bartels, Veronica Cardenas and Sanam S Dhaliwal, et al. "Cultural Beliefs and Mental Health Treatment Preferences of Ethnically Diverse Older Adult Consumers in Primary Care." *Am J Geriatr Psychiatry* 20 (2012): 533-542.
19. Conner, Kyaien O, Valire Carr Copeland, Nancy K Grote and Gary Koeske, et al. "Mental Health Treatment Seeking Among Older Adults with Depression: The Impact of Stigma and Race." *Am J Geriatr Psychiatry* 18 (2010): 531-543.
20. Bartels, Stephen J. "Improving the United States' System of Care for Older Adults with Mental Illness: Findings and Recommendations for the President's New Freedom Commission on Mental Health." *Am J Geriatr Psychiatry* 11 (2003): 486-497.
21. "Mentally Healthy Aging: A Report on Overcoming Stigma for Older Americans." *Subst Abuse* (2007).
22. Abdi, Hervé and Lynne J Williams. "Tukey's Honestly Significant Difference (HSD) Test." *Encyclop Res Desig* 3 (2010): 1-5.
23. Kim, Hae-Young. "Analysis of Variance (ANOVA) Comparing Means of More than Two Groups." *Restor Dent Endod* 39 (2014): 74-77.
24. Roesch, Elisabeth, Avni Amin, Jhumka Gupta and Claudia García-Moreno. "Violence against Women during Covid-19 Pandemic Restrictions." *BMJ* 369 (2020): m1712.
25. Reynolds 3rd, Charles F, Dilip V Jeste, Perminder S Sachdev and Dan G Blazer. "Mental Health Care for Older Adults: Recent Advances and New Directions in Clinical Practice and Research." *World Psychiatry* 21 (2022): 336-363.
26. Norton, Sam, Fiona E Matthews, Deborah E Barnes and Kristine Yaffe, et al. "Potential for Primary Prevention of Alzheimer's Disease: An Analysis of Population-Based Data." *Lancet Neurol* 13 (2014): 788-794.
27. Jeste, Dilip V and Vivian B Pender. "Social Determinants of Mental Health: Recommendations for Research, Training, Practice, and Policy." *JAMA Psychiatry* 79 (2022): 283-284.
28. Lee, Ellen E, Katherine J Bangen, Julie A Avanzino and BaiChun Hou, et al. "Outcomes of Randomized Clinical Trials of Interventions to Enhance Social, Emotional, and Spiritual Components of Wisdom: A Systematic Review and Meta-Analysis." *JAMA Psychiatry* 77 (2020): 925-935.
29. Abdi, Hervé. Experimental Design and Analysis for Psychology. *OUP Oxford* (2009).
30. Kola, Lola, Brandon A Kohrt, Charlotte Hanlon and John A Naslund, et al. "COVID-19 Mental Health Impact and Responses in Low-Income and Middle-Income Countries: Reimagining Global Mental Health." *Lancet Psychiatry* 8 (2021): 535-550.
31. Rajkumar, Ravi Philip. "COVID-19 and Mental Health: A Review of the Existing Literature." *Asian J Psychiatr* 52 (2020): 102066.

How to cite this article: Xie, Liming and Xin Li. "The Impact of the Symptoms of Anxiety and Depressive Disorders on American Householders during COVID-19 Pandemic: A Group and Subgroup-Based Cohort Study." *Clin Schizophr Relat Psychoses* 18 (2024). Doi: 10.3371/CSRP.XLXL.123124.