Exploring Racial Disparities in Mental Health: A Study on the Severity of Comorbid Substance Use and Depression

Elijah Woodson

Honors Research Proposal

Department of Psychology, The University of Texas at Austin

Faculty Mentor: Alissa Mrazek, PhD

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Abstract

Depression and substance use disorders (SUDs) share and exacerbate each other's symptoms creating a complex relationship known as comorbidity. The increasing prevalence of both is a pressing issue resulting in higher mortality rates and decreased individual well-being. However, the severity of these comorbid disorders and how they vary across racial groups is poorly understood. For decades, the United States has employed systemically inequitable practices that continue to negatively impact racial minorities. This study used data from the Substance Abuse and Mental Health Services Administration's (SAMHSA) 2023 National Survey on Drug Use and Health (NSDUH). A linear regression was used to examine the relationship between race and the severity of comorbid SUD and depression, as well as depression severity and SUD severity. Results revealed that Black people do not experience greater severity in comorbid substance use and depression compared to other racial groups, however, race did significantly predict comorbid SUD and depression severity. Additionally, Native American/Alaskan Natives had significantly higher depression severity and SUD severity than other racial groups. In contrast, Asian individuals experienced significantly lower SUD severity than the other racial groups. These findings indicate that Native American/Alaska Natives experience the greatest depression severity and SUD severity, and Asian people experience the lowest SUD severity, while no racial group experiences significantly different severity in comorbid SUD and depression Future research should explore severity rates in other comorbid pairs, examine the impact of geographic factors, and examine the relationship between severity and mental health treatment utilization.

Substance use disorders (SUDs) are a type of mental illness diagnosed by at least one maladaptive pattern of substance use over the span of one year. Criteria include frequent substance use in hazardous situations and reoccurring substance-related legal problems. Substance use that results in clinically significant impairment also meets criteria for an SUD like continued substance use despite having frequent interpersonal and social problems intensified by substance use or an inability to fulfill major responsibilities at work, home, or school (Treatment, 2012). Substance use disorders have had varying prevalence rates over the past few years among adults, reaching 17% in 2023 (Substance Abuse and Mental Health Services Administration, 2024). Additionally, there has been a rise in overall mental illness, including disorders like depression.

Depression is categorized into two types: major and minor depressive episodes. Major depressive episodes are diagnosed when five or more depressive symptoms are identified and persist for at least two weeks. Symptoms include depressed mood, anhedonia (lack of interest in pleasurable activities), insomnia or hypersomnia, loss of energy, excessive guilt, feelings of worthlessness, impaired ability to concentrate/indecisiveness, and reoccurring thoughts of death or even suicidal ideation (O'Connor et al., 2009). Depression is a more commonly understood and prevalent mental illness affecting 8.3% or 21 million adults in the U.S in 2021 (*Major Depression - National Institute of Mental Health (NIMH)*, n.d.).

The comorbid relationship between SUDs and other disorders like depression, anxiety disorders, etc. and the factors exacerbating the relationship are commonly studied. However, researchers are unclear on how these factors impact the severity of the comorbid disorders. It is

unclear whether variables like sex, gender, sexuality, or race decrease or increase the severity of comorbid disorders.

Understanding the severity of mental illnesses is crucial for evaluating the effectiveness of current treatment strategies, and their ability to address the needs of diverse populations. However, the full understanding of their efficacy and how it addresses health outcomes across diverse populations remains unknown. Despite growing recognition of mental health disparities, there is limited research on how racial factors influence the severity of comorbid substance use and depression. This study sought to fill that gap by analyzing data from the Substance Abuse and Mental Health Services Administration's (SAMHSA) 2023 National Survey on Drug Use and Health (NSDUH). Specifically, it will explore whether race plays a significant role in the severity of comorbid substance use and depression. It was hypothesized that race will impact the severity of comorbid substance use and depression and that Black people will experience the greatest severity.

Racial Disparities

Since the birth of the United States, society has struggled balancing equality with progress. This constant battle has led to the consistent oppression of various minority groups throughout history. Inequities can be found in all aspects of society, such as the healthcare, judicial, and educational systems. The systemic inequities affect all minority groups creating a profound and lasting impact on racial minorities.

Systemic racial disparities have been perpetuated by practices like redlining, unjust criminal policies, and voter suppression, all of which have had major and lasting impacts on minority communities. Redlining, a process developed and maintained by the Home Owners Loan Corporation's partnership with realtors and bankers, identified minority neighborhoods as "risky" investments, thus denying them access to federal loans and preventing socioeconomic development (Banaji et al., 2021). This discriminatory practice created neighborhoods filled with extreme poverty and limited access to healthcare establishing a massive wealth gap that persists today. These enduring disparities, paired with a lack of support and treatment, can foster chronic stress which could exacerbate depression and SUDs and increase the severity of their comorbidity.

Similarly, the criminal justice system has disproportionately impacted Black Americans (especially Black men), with Black individuals representing 38.7% of the prison population despite making up only 14.4% of the total U.S. population (BOP Statistics: Inmate Race, 2025; Passel, 2025; Braveman et al., 2022). This clear act of systemic inequality has restricted economic opportunities for ex-prisoners and prevented them from a variety of employment opportunities. This racial bias even extends into educational systems, where people of color have

fewer and less favorable educational resources. Minority students are also subjected to harsher disciplinary actions, increasing the risk of incarceration, also known as the “school to prison pipeline” (Braveman et al., 2022). The unfair treatment of students of color in their education leads to a higher rate of suspensions, this is correlated with an increase in criminal like behavior resulting in a more than doubled probability of arrest in problem youth, specifically Black students (Cuellar & Markowitz, 2015). Additionally, the unjust punishment of Black Americans, prevents them from receiving adequate education in schools and forces them into the criminal system where they lack access to decent mental health treatment. This could cause them to rejoin society with more severe and untreated mental health conditions.

Furthermore, voter suppression practices, such as the "grandfather clause" and gerrymandering, have deprived racial minorities of a fair chance to vote. These systems have made it incredibly difficult to access the political power necessary for systemic reform (A History of Voter Suppression | National Low Income Housing Coalition, 2025; Derek et al., 2021). These ongoing inequities, coupled with widespread denial of their existence (Roberts & Rizzo, 2020), continue to perpetuate disparities in wealth, education, and health.

Mental Health disparities

The United States is one of the wealthiest countries in the world, resulting in a massive spending capacity for funding necessary national programs. In 2014, the U.S. spent roughly $3 trillion dollars in the healthcare industry (Rahn et al., 2018). This makes it the highest healthcare spender per capita in the world. However, it does not have universal healthcare and it has a lower life expectancy than other countries, as well as worse health outcome measures like increased homelessness and suicide (Rahn et al., 2018). Health disparities are widespread and can be seen

in medical practitioners, including mental health care providers who have implicit biases (Chapman et al., 2013). Implicit bias is a result of the internalized stereotypes or attitudes that unconsciously affect our behaviors, choices, and beliefs (Shah & Bohlen, 2025). These biases continue to impact and influence providers and how they treat their patients despite their high intelligence. Providers need to commit to becoming more culturally aware, prioritizing health equity and utilizing training like comprehensive bias training. (Campbell, 2025). These biases lead to unjust and inaccurate conclusions about minority groups and result in unhelpful or even harmful treatment outcomes.

Barriers in Mental Health Care

A variety of barriers contribute to racial disparities in utilization of mental health treatment services. One barrier is the cultural stigma surrounding mental health. Many racial groups have developed a fear or distrust in the medical system over time leading to the denial of mental health problems, a cultural belief that individuals are strong enough to overcome their problems, and a general fear of being shunned for accessing resources (Asonye et al., 2020). There is also a clear lack of culturally sensitive practices that account for unique identity based experiences. Although there are some trainings or programs that work to improve providers' cultural competence. The lack of literature on how to treat minority groups results in improperly defined treatment plans such as, the poorly defined competency lessons for LGBT and disabled populations. (Butler et al. 2016). Not only are the mental health care providers commonly unaware of what it is like to be a racial minority, their services are often unattainable, even for those who are interested. As a result of the previously discussed systemic inequities, there is a very clear wealth gap between the racial minorities and White people (Asonye et al., 2020).

Major Depression

Major Depression is one of the most prevalent mental illnesses in the United States affecting all age groups. According to the National Institute of Mental Health (NIMH, 2023) it is classified by "a period of at least two weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities, and had a majority of specified symptoms, such as problems with sleep, eating, energy, concentration, or self-worth". Major depressive episodes occurred in roughly 21 million adults across the United States representing 8.3% of all American adults in 2021. In 2021 the highest prevalence rates were seen in adults age 18-25 where 18.6% experienced at least one major depressive episode. People who report being biracial or having multiple races have the highest rates of depression across racial groups peaking at 13.9% in 2021. American Indian/Alaskan Native's have the second highest prevalence rates of 11.2% followed by White people with a prevalence of 8.9%. In 2021, it is estimated that 61% of American citizens over the age of 18 diagnosed with major depressive episode sought and received treatment over the past year In 2021, an estimated 61.0% U.S. adults aged 18 or older with major depressive episode received treatment in the past year. Although there is a large portion of citizens seeking treatment, there is a clear difference in what racial groups are mostly seeking treatment. In a study of almost 600,000 U.S. citizens on medicaid with depression, 14.3% did not seek out any form of treatment (McGregor et al., 2020). Of the 14.3%, 19.9% were Black people and 15.2% were Hispanic, compared to 11.9% of White people. Not only do people of color get lower quality treatment, but they are also more likely to not seek out treatment.

Substance Use Disorder

Substance use disorders have 11 different diagnostic criteria that fall under four categories: physical dependence, impaired control, risky use, and social problems (Foundation, 2021). In 2023, the National Survey on Drug Use and Health (NSDUH) surveyed Americans aged 12 and older and found that roughly 17.1% or 48.5 million struggled with a substance use disorder in the past year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024). There was a large range of variability in the prevalence of SUDs across race: American Indian/Alaskan Native people had the highest prevalence (27.6%), then Multiracial people (25.9%), then Black people (17.2%), then White people (17%), then Hispanic people (15.7%), and lastly Asian people (8%) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2021). This survey also found that 20.4 million or 7.9% of American adults suffered from a comorbid disorder, having a substance use disorder and at least one other mental health disorder. The age group that had the highest prevalence of SUDs were adults aged 26 - 64, 37 million (16.6%) of these citizens battled with a SUD in the past year.

Comorbid Substance Use Disorder and Depression

Comorbid substance use and depression disorders have a rare complex and bidirectional relationship. Kessler et al., (2005) found that individuals with either a SUD or depressive disorder were at an increased risk for the other disorder. This creates a complex pair of disorders to understand and treat. Additionally, the specific risk factors for the development of a comorbid disorder are difficult to pinpoint and vary across racial groups. Some aspects of comorbid disorders are unknown, but as of now we know that approximately 7.3% of U.S. citizens have one. When looking across race, 8.2% of White people, 5.4% of Black people, 5.8% of Hispanic

people, and 2.1% of Asian people met the criteria for a comorbid disorder at some point in their life (Mericle et al., 2012). In a study of Rochester Youth, Jones et al. (2024) explored the development of comorbid substance use and depression across racial groups in the youth population. They found that the predictive factor for the development was different between racial groups. In Black and Hispanic youth, substance use was the predictive factor for the development of a comorbid disorder with depression. This shows that using substances at an early age significantly increased the chance of developing comorbid depressive symptoms. In contrast, depression served as the primary risk factor for the onset of substance use disorders in White youth. This suggests a different pattern of comorbidity progression. The difference of comorbid development between racial groups emphasizes the importance of considering racial and cultural factors when examining the relationship between substance use and depression.

These findings support the importance of culturally tailored interventions to appropriately address the existing systemic inequities and the complexity of co-occurring and bidirectionally related disorders. The next crucial step in addressing comorbid disorders and the different risk factors in each race is to understand the best treatment approach. Because the disorders are co-occurring it is necessary to address their symptoms simultaneously through interventions like cognitive behavioral therapy, mindfulness-based relapse prevention, and behavioral activation therapy (Glasner & Eastlick, 2024). Understanding the crucial components of comorbid substance use and depression helps researchers and mental health professionals understand how to address the disorders even when faced with cultural differences.

Treatments for Mental Illness

Effective treatment for mental health disorders like SUDs and depression directly relies on understanding the severity of each condition (*Overview - Depression in Adults*, 2021). The treatment approach can vary depending on the level of severity. It is also crucial to consider whether or not an individual has a comorbid condition The severity of depression and SUD dictates the intensity and duration of care, but more importantly, the treatment type. For example, individuals with mild depression may benefit from psychotherapy or brief interventions like attention bias modification (ABM) (Beevers et al., 2015). ABM is an intervention based in cognition functioning that trains participants to work against their negative information bias which causes them to focus on negative stimuli. Those with severe depression may require a medical intervention combined with inpatient care and cognitive behavioral therapy (Guidi et al., 2015). It is equally important to consider the severity when making treatment decisions on people with a SUD. Patients with mild substance use can be treated with outpatient therapy, whereas patients with may require intensive residential treatment or medical detoxification (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024).

Understanding the severity of comorbid SUD and depression is especially important when tailoring treatment plans due to their complex relationship. Identifying the severity also helps us understand what populations might be experiencing excessively severe illnesses and allows us to provide them with the appropriate help. Research indicates that individuals with comorbid depression and SUD often experience more severe symptoms when compared to those with a single disorder (Kessler et al., 2005). These patients often require integrated treatment approaches, which address both conditions simultaneously (Lydecker et al., 2010). This comprehensive approach is crucial in improving long-term outcomes, reducing the risk of relapse, and helping individuals manage the complexities of living with both a mood disorder

and substance use problem (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024).

Depression Treatment

Depression is one of the most prevalent mental health disorders in the United States, and its severity plays a major role in the treatment approach. For individuals with mild to moderate depression, cognitive-behavioral therapy (CBT) or other forms of psychotherapy, such as interpersonal therapy (IPT), are often effective. CBT utilizes behavioral activation strategies in conjunction with belief change and cognitive restructuring to prevent relapse in patients (Sudak, 2012). CBT is substantially researched throughout the field, especially its efficacy while treating depression. However, researchers are unsure of what specific mechanism in CBT creates so much change, for example, Hundt, et al., (2012) states that the impact of the quality or frequency of CBT skill use on patients' symptoms are unknown. For individuals with severe depression, pharmacotherapy is often recommended in combination with psychotherapy (Guidi et al., 2015). Antidepressant medications are often used to manage the symptoms of moderate to severe depression (Cipriani et al., 2018)

Substance Use Disorder Treatment

The severity of an SUD dictates the type of treatment an individual needs. Research shows a personalized model of treatment can be effective across all severity levels (Volkow, 2020). When planning treatments, healthcare providers should keep in mind the goal of the patient: abstinence or harm reduction. Abstinence would be the complete cessation of substance use, whereas harm reduction would be a decrease in substance use to improve quality of life to the patient's ideal level of functioning. For mild substance use, cognitive behavioral therapy has

proven helpful (McHugh et al., 2010). Additionally, residential treatment programs may be required for individuals with severe addiction, providing a structured and supportive environment to help patients recover. Severe cases of SUD are more often than not tightly connected to another mental illness creating a bidirectional relationship leading to a comorbid disorder.

Comorbid Substance Use Disorder and Depression Treatment

The simultaneous presence of depression and a SUD creates a complicated comorbid relationship that makes it significantly more difficult for patients to adhere to treatment plans while managing the overlapping and exacerbated symptoms of both disorders (Teesson et al., 2005). The complex relationship between these disorders requires an integrated treatment approach. Watkins, et al., (2023) studied the impacts of integrated treatment on veterans who helped save lives during 9/11 and explored the efficacy of a 2-week intensive outpatient program on their posttraumatic stress disorder (PTSD), substance use, and depression symptoms. The outpatient program employed empirically supported therapies like CBT and prolonged exposure therapy. Watkins' team found significant reductions in all self-reported symptoms and participants reported increased satisfaction when participating in their social roles. In another study on veterans by Lydecker, et al., (2010), researchers evaluated the effectiveness of two separate integrated treatments for 206 veterans with co-occurring depression and SUDs. Participants were randomly assigned between two treatment conditions: Integrated Cognitive Behavioral Therapy with Pharmacotherapy (ICBT+P) or Twelve-Step Facilitation with Pharmacotherapy (TSF+P). Lydecker’s team found that both treatment conditions had a significant decrease in depression and substance use. However, the ICBT+P group was more successful in maintaining improvements in substance use habits over time, whereas the TSF+P

group experienced a rapid increase in substance use after the treatment. The TSF+P group also saw a more significant decrease in depression symptoms in the 6-month post-treatment period.

It is clear that the presence of comorbid depression and SUD complicates the treatment of both disorders, however the integrated treatment practices have shown promising results. Individuals suffering from both disorders are able to benefit from integrated treatments that only use psychotherapy and treatments that combine psychotherapy with pharmacotherapy. The dual-focused approach helps individuals build the coping skills needed to manage both their depressive symptoms and their substance use.

Substance Abuse and Mental Health Services Administration

The Substance Abuse and Mental Health Services Administration (SAMHSA) was founded in 1992 by Congress. This agency works towards increasing behavioral health across the nation by providing a variety of services and resources to help the U.S. SAMHSA is focused on achieving five main goals: prevent overdoses, enhance access to suicide precention and crisis care, promote resilience and mental health for all citizens, integrate physical and behavioral health care, and enhance the behavioral health workforce (Substance Abuse and Mental Health Services Administration, 2024). As a part of this goal, SAMHSA has created the National Survey on Drug Use and Health (NSDUH) used to assess demographics, substance use, mental health, mental health service utilization, and recently, the impact of COVID-19 on U.S. citizens. This survey helps researchers and healthcare providers understand the behavioral health habits of U.S. citizens and helps them understand how change can be made.

The NSDUH's Substance Use Disorder section is used to identify participants, regardless of age, that meet the criteria for a SUD. This section has a mixture of "yes or no", numerical

scale, and severity scale questions. This section utilizes the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5-TR) to diagnose participants with a type of SUD by combining. One example of a question is “In the past 12 months, did you often wish that you could cut down or stop drinking alcohol?” In the DSM-5-TR 11 criteria have been shown to lead to a SUD, to receive a SUD diagnosis a participant needs to meet at least two criteria, see Appendix A.

The NSDUH’s Adult Depression section helps identify which participants, over the age of 18, meet the criteria for Major Depressive Episode (MDE). This section is intended to assess the existence and potential severity of a participant's MDE(s). This section has a mixture of “yes or no”, numerical scale, and severity scale questions. One example of a question used in this section is “Have you ever had a period of time lasting several days or longer when most of the day you felt sad, empty, or depressed?” At the end of the section the participants' responses are combined and matched with the MDE criteria listed in the DSM-5-TR to diagnose a disorder, see Appendix C.

Conclusion

The United States leads the world in healthcare expenditure, yet, their health outcomes are lower than poorer countries, specifically in racial minorities (Rahn et al., 2018). Despite the excess in healthcare funding, these groups consistently experience unhelpful, biased, and even harmful health services clearly indicating the existence of mental health disparities. Additionally, the stigma and systemic barriers surrounding mental health in minority communities discourages and prevents individuals from seeking treatment (Asonye et al., 2020). Research demonstrates that systemic inequities like redlining, unjust prison systems, and voter suppression likely impact

races differently, further contributing to disparities in mental health care (Braveman et al., 2022). Mental health providers often fail to consider how cultural identity and historical factors change individuals' health due to the large gap of literature and data on the intersection of culture and healthcare (Butler et al., 2016). Researchers have a sufficient understanding of the prevalence of depression, SUD, and comorbid SUD and depression across the country (Substance Abuse and Mental Health Services Administration, 2024). They also understand what treatments are effective and ineffective when treating the individual disorders and as a comorbid pair (Watkins, et al., 2023). However, the field has not yet explored how the severity of comorbid substance use and depression varies across racial groups. This study seeks to identify the impact of race on the severity of comorbid SUDs and depression. This study will analyze data from the SAMHSA's 2023 NSDUH to explore these relationships and understand the impact of race on the severity of comorbid SUD and depression. A follow-up analysis will explore if the severity of the comorbid disorders predicts the use of mental health service utilization. It is hypothesized that Black People, as a result of systemic inequities, will experience greater severity in their comorbid disorder compared to the other racial groups.

Methods

Study Design Overview

This study investigated the impact of race on the severity of existing comorbid SUD and depression. Participants, aged 18 and older, who meet DSM-5-TR criteria for both SUD and depression, will be grouped by race. Racial identity will serve as the independent variable, while severity of depression, severity of SUD, and severity of the comorbidity of the two disorders will be the dependent variables. It was hypothesized that the severity of depression, SUD, and the comorbid pair will vary with race and be greatest among Black people due to historical systemic racial disparities.

Participants

Participants who were identified to have one or more types of substance use disorders (n = 9,933), depression n = (4,990), and comorbid substance use and depression (n = 1,982). Participants under the age of 18, did not have depression or at least one SUD, were non- United States citizens, and were institutionalized at the time of the survey were excluded. Participants were grouped by self-reported racial identity. Other recorded demographics included sex, sexual attraction, age, and English proficiency. Participants received monetary compensation across all methods of data collection (i.e., online or in-person at eligible locations). Responses were collected throughout 2023. However, as a result of the multi-modal data collection there was attrition across some measures.

Materials and Measures

Substance Use Disorder

SUD's were diagnosed using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5-TR) (American Psychiatric Association, 2013). This diagnosis used up to eleven different diagnostic criteria for example: using a substance in a larger amount or for a longer time than intended (see Appendix A). To be diagnosed with an SUD a participant must have at least two of the eleven criteria. In the 2023 NSDUH, each diagnostic criteria is associated with a specific question (see Appendix B), for example: "During the past 12 months, were there many times when you ended up drinking alcohol in larger amounts or for a longer time than you meant to?" However, the NSDUH included multiple items for some of the SUD criteria. To address this the criterion was scored as "Yes" (1) if any of the items were endorsed for the past 12 months. If none of the items were endorsed for the criterion then it was scored as "No" (0). To obtain a score on the scale of 0-11 a sum of scores were compiled across all 11 criteria. The DSM-5-TR has pre-validated levels of severity which range from mild (2-3 diagnostic criteria) to moderate (4-5 diagnostic criteria) to severe (6+ diagnostic criteria). The categories were used to characterize the severity of the comorbidity, but in the analysis the specific scores were used.

Depression

The Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001) is used to diagnose depression in adults using nine different diagnostic criteria. One example question of this is "Over the last 2 weeks, how often have you been bothered by any of the following problems? Little interest or pleasure in doing things" (see Appendix C). These questions are answered on a 4-point likert scale (0= Not at all, 1 = Several days, 2 = More than half the days, 3 = Nearly every day). In the NSDUH, SAMHSA used a shortened version of this survey, the PHQ-8. Additionally, the questions no longer used a 4-point likert scale and instead

were made into dichotomous questions (1 = Yes, 2 = No). An example of one of these adapted questions is “During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy” (see Appendix D). These questions were scored on a scale of 0-8 where a “Yes” was coded as 1 and a “No” was coded as a 0. In the original survey, there were five severity categories based on the scores: 0-4 minimal or no depressive symptoms, 5-9 mild depressive symptoms, 10-14 moderate depressive symptoms, 15-19 moderately severe depressive symptoms, 20-24 severe depressive symptoms. Since SAMHSA adapted the PHQ-8 to dichotomous answers the new severity categories were: 0-1 minimal or no depressive symptoms, 2-3 mild depressive symptoms, 4 moderate depressive symptoms, 5-6 moderately severe depressive symptoms, 7-8 severe depressive symptoms. The categories were used to characterize the severity of the comorbidity, but in the analysis the specific scores were used.

Comorbidity of Depression and SUD

No standardized index has been established to quantify comorbidity severity. To address this gap, a rescaled measure was constructed through summing the scores of established depression and SUD severity scales. To ensure the comorbid severity measure was weighted evenly, depression severity (0-8) and SUD severity (0-11) were rescaled to each be 0-1. To calculate the score for depression and SUD the participants' score was divided by the maximum score for each scale, 8 for depression and 11 for SUD. For example, a depression score of 4 becomes 4/8 = 0.5. The comorbid severity score was a sum of both scores and ranges from 0 (no severity) to 2 (maximum severity). The severity categories of: 0 - .26 minimal, .26-.58 mild, .58 -

.89 moderate, .89 - 1.53 moderately severe, 1.53 - 2 severe. The categories were used to characterize the severity of the comorbidity, but in the analysis the specific scores were used.

Statistical Analysis

Statistical analyses were performed in *R* to analyze and visualize the data. A multivariate linear regression was used to assess the relationship between the independent variable of race on the dependent variables of SUD severity, depression severity, and comorbid severity of the two disorders. By using a linear regression, the results were controlled with the covariates of age, sex, sexual attraction, and English proficiency.

Results

Descriptive Statistics

This sample consisted of 1,982 adults who met the criteria for having both a substance use disorder (SUD) and depression. The average age group was 35-49 (21.9%) and 62.9% of the sample was female. Racial distribution was as follows: 62.1% non-Hispanic White, 17.3% Hispanic, 9.6% non-Hispanic Black/African American, 7.4% non-Hispanic Multiracial, 2% non-Hispanic Asian, 1.4% Non-Hispanic Native American/Alaskan, and .3% non-Hispanic Native Hawaiian/Pacific Islander.

In terms of sexual attraction, 49.2% of participants reported being only attracted to the opposite sex, followed by 21.7% of participants being mostly attracted to only the opposite sex, 17.7% of participants were equally attracted to both sexes, 4.2% of participants were most attracted to their same sex, and 3.9% of participants were only attracted to their same sex.

English proficiency was common with 93.6% of participants reporting they speak English "very well," 5.7% of participants spoke English "well," .3% of participants reported that they spoke English "not well," and lastly, .1% of participants reported that they spoke English "not at all."

Descriptive statistics for comorbid severity of depression and SUD by race are shown in Table 1. The highest average comorbidity score was observed among non-Hispanic Native American/Alaska Native participants (M = 1.45, SD = 0.28), and the lowest was among non-Hispanic Asian participants (M = 1.29, SD = 0.29).

Relationship Between Racial Group and Comorbid Severity

A linear regression was conducted to examine whether race and the covariates of age, sex, sexual attraction, and English proficiency, impacted the severity of comorbid SUD and depression. Results of the full model are shown in Table 2. The overall model was statistically significant, $F(22, 1946) = 2.41$, $p = .00025$, with a small effect size ($R^2 = .02$). However, using Black participants as the reference group, no racial group significantly differed from them on comorbid severity. Native American/Alaska Native participants showed a nonsignificant trend toward higher comorbid severity ($\beta = 0.089$, $p = .13$), whereas Asian participants showed a nonsignificant trend toward lower severity ($\beta = -0.078$, $p = .12$). Severity scores for non-Hispanic White ($\beta = 0.008$, $p = .97$), Native Hawaiian/Other Pacific Islander ($\beta = 0.154$, $p = .28$), multiracial ($\beta = -0.026$, $p = .29$), and Hispanic participants ($\beta = -0.022$, $p = .21$) did not significantly differ from Black participants.

Relationship Between Racial Group and Depression Severity

A linear regression assessed whether race predicted depression severity after controlling for age group, sex, sexual attraction, and English proficiency. The overall model was significant, $F(20, 4{,}596) = 4.30$, $p < .001$, with a small effect size ($R^2 = .019$).

Using Black participants as the reference category, results indicated that most racial groups did not significantly differ from Black people in depression severity. The only significant difference emerged for Native American/Alaskan participants, who reported higher depression severity than Black participants ($\beta = 0.46$, $SE = 0.15$, $t = 3.04$, $p = .002$). No significant differences were observed for non-Hispanic White ($\beta = 0.04$, $p = .47$), Asian ($\beta = -0.11$, $p = .32$), Native Hawaiian/Other Pacific Islander ($\beta = 0.19$, $p = .61$), multiracial participants ($\beta = 0.08$, $p = .27$), or Hispanic participants ($\beta = 0.04$, $p = .21$).

Relationship Between Racial Group and SUD Severity

A third linear regression examined whether race predicted SUD severity. The model was significant, $F(20, 8{,}237) = 7.66$, $p < .001$, with a small effect size ($R^2 = .018$). Compared to Black participants, Native American/Alaskan participants reported significantly higher SUD severity ($\beta = 0.55$, $SE = 0.19$, $t = 2.89$, $p = .004$), and Asian participants reported significantly lower SUD severity ($\beta = -0.54$, $SE = 0.19$, $t = -2.94$, $p = .003$). No significant differences were found for non-Hispanic White ($\beta = -0.10$, $p = .21$), Native Hawaiian/Other Pacific Islander ($\beta = 0.29$, $p = .44$), multiracial participants ($\beta = -0.07$, $p = .57$), or Hispanic participants ($\beta = -0.13$, $p = .20$).

Table 1

Demographic Characteristics of Participants

Characteristic	n	Percent (%)
Sex at Birth		
Female	1246	62.9
Male	220	37.1
Age Group (years)		
18–20	285	14.4
21–23	437	22.0
24–25	244	12.3
26–29	219	11.0
30-34	254	12.8
35-49	435	21.9
50-64	90	4.5
65+	18	0.9
Race/Ethnicity		
Non-Hispanic White	1231	62.1
Black or African American	190	9.6
Native American /Alaskan Native	27	1.4
Native Hawaiian /Pacific Islander	6	0.3
Asian	40	2.0
Multiracial	146	7.4
Hispanic	342	17.3
Sexual Attraction		
Only Opposite Sex	975	49.2
Mostly Opposite Sex	430	21.7
Equally Both Sexes	351	17.7
Characteristic	**n**	**Percent (%)**
Mostly Same Sex	84	4.2

Only Same Sex	78	3.9
Not Sure	52	2.6
NA	12	0.6
English Proficiency		
Very Well	1855	93.6
Well	113	5.7
Not Well	6	0.3
Not at All	1	0.1
NA	7	0.4

Note. N = 1,982. This table included participants from the comorbid depression and SUD group. NA's represent questions that participants skipped on the NSDUH.

Table 2

Linear Regression Model Examining the Impact of Race on Comorbid SUD and Depression Severity

Factors	Estimate	SE	T	P
Race/Ethnicity				
Intercept	1.38	.029	48.4	<.001
non-Hispanic White	.0008	.022	.035	.971
Native American /Alaskan Native	.090	.059	1.53	.126
Native Hawaiian/Pacific Islander	.160	.143	1.08	.281
Asian	.080	.050	-1.60	.121
Multiracial	.030	.031	-.826	.410
Hispanic	.022	.030	-.827	.410

Note. SE = standard error; T = t-value; P = p-value; N = 1,982. This table included participants from the comorbid depression and SUD group and all results are accounting for all covariates. This table does not report covariates since the main focus is the impact of race and the covariates are used to ensure the model is robust.

Discussion

The present study aimed to explore whether race impacts the severity of comorbid substance use and depression. Using data from the Substance Abuse and Mental Health Services Administration's (SAMHSA's) 2023 National Survey on Drug Use and Health (NSDUH), these findings revealed important insights into the relationship between race and severity of depression, SUD, and comorbid depression and SUD.

The results from this study did not support the original hypothesis that Black people would experience the greatest comorbid SUD and depression severity. However, when examining the impact of race on SUD and depression independently it was found that Native Americans/Alaskan Natives have a significantly higher severity of both. In contrast, Asians were found to have a significantly lower level of SUD severity. These patterns align with prior research on elevated rates of prevalence in both depression and SUDs among Native American communities and comparatively lower rates of SUD among Asian Americans (Mericle et al., 2012; SAMHSA, 2021).

The lack of racial differences in comorbid severity is important to interpret in the context of existing literature on systemic inequities. Historical and ongoing practices such as redlining, discriminatory incarceration policies, and educational inequities have clearly shaped mental health risk and access to care for racial minorities (Braveman et al., 2022; Cuellar & Markowitz, 2015; Roberts & Rizzo, 2020). The present findings do not contradict that work; rather, they highlight that disparities do not always appear as differences in symptom counts or severity scores alone. It may be that once an individual develops both depression and a SUD the clinical burden is high across the board, regardless of race. It is possible that the disparities around

severity scores may be seen in how early the disorders are diagnosed, what happens after a diagnosis, and whether or not treatment ever occurs. It's likely that in populations like the Native American/Alaskan Native group, that they are often diagnosed with these disorders since their prevalence rates are so high, but then they do not receive treatment which could be a result of a lack of access or a barrier of stigma surrounding mental health treatment.

This study is the first to explore how severity of depression and severity of SUD vary across racial groups. It is also the first to specifically explore how race impacts the severity of the comorbidity between the two disorders. This study also contributes to the small but growing body of research that uses large, nationally representative samples to examine comorbid depression and SUD. Much of the previous work on comorbidity has focused solely on prevalence or on treatment outcomes in specific clinical populations (Lydecker et al., 2010; Watkins et al., 2023). By instead focusing on severity in a general representative population sample, this study offers an additional lens: the magnitude of symptomology for those living with both disorders, and whether that intensity is distributed differently across racial groups. The finding that comorbid severity differs across races, but is not significantly different when compared between black people and other races, suggests that severity alone may not be the best single indicator for understanding racial disparities in mental health. Rather, severity is likely impacted by other environmental factors such as geographic location, income, education, and other health characteristics, which can greatly shape the outcomes of an individual's mental health.

Several limitations should be considered when interpreting these findings. First, the lack of information about the timeline of disorder onset,how long each lasted, and the temporal order of depression versus SUD cannot be established. Prior work shows that the direction of comorbidity can differ by race (Jones et al., 2024), in some racial groups substance use can be the disorder that predicts the onset of depression and in other groups it can be the opposite. This research shows the importance of understanding the origin of an individual's disorders to better understand what came first to ensure an informed treatment process. Second, the measures of depression and SUD severity used here are based on NSDUH's adaptations of DSM-5 and PHQ items, which were condensed into dichotomous indicators. While this approach is useful for large-scale surveillance, it could potentially oversimplify the range of symptom experiences and may obscure important nuances. .

Additionally, the comorbid severity score, while conceptually grounded, is a self-made measure that combines rescaled depression and SUD scores. This method assumes that both disorders contribute equally and additively to a shared severity construct, which may not accurately reflect the complexity of comorbid presentations. Next, all variables were self-reported, which can introduce bias and underreporting. Lastly, some racial groups, such as Native Hawaiian/Other Pacific Islander and Native American/Alaskan participants, had relatively small sample sizes (though are relatively comparative to their population in the U.S.) compared to White or Black participants, which may have limited power to detect group differences even when effect sizes were meaningful.

Despite these limitations, the present study has several strengths. It draws on a large, nationally representative dataset, incorporates both depression and SUD diagnoses grounded in DSM-5 and PHQ-8 criteria, and focuses specifically on severity rather than continuing to only study prevalence of a disorder. It also positions the statistical findings within a broader understanding of systemic inequity, acknowledging that numbers alone cannot capture the full weight of historical and structural forces shaping mental health in the United States.

Future research should build on these findings in several ways. One important direction is to examine geographic factors, such as region, urban versus rural status, and neighborhood-level deprivation, to understand how place-based inequities intersect with race to influence comorbid severity and treatment access. This research can help inform whether there are certain geographical locations where certain racial groups are more or less prone to high severity which increase the national average. Another direction is to explore other comorbid pairs, such as depression with anxiety, post traumatic stress disorder with SUD, or bipolar disorder with SUD, to see whether similar patterns emerge or whether certain combinations show stronger racial differences in severity. It will also be crucial to identify culturally specific risk pathways—for example, chronic exposure to discrimination, differential access to coping resources, or community-level resilience factors—that may shape how comorbid disorders develop and persist in different racial groups.

Ultimately, this line of work can inform community-partnered, culturally tailored interventions aimed at reducing barriers to care. Interventions that are brief, accessible, and grounded in the lived realities of specific communities may be especially valuable for individuals

with comorbid depression and SUD who are not currently connected to formal treatment systems.

In summary, this study found that race significantly impacts the severity of depression, SUD, and comorbid depression and SUD. These findings highlight the need to look beyond severity to the broader social and structural forces that shape mental health outcomes. Understanding how systemic inequities intersect with comorbid mental illness remains a critical task for researchers, clinicians, and policymakers committed to promoting equitable, effective care for all communities.

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Appendix A: DSM-5 Substance Use Disorder Criteria

1. Using more of a substance than intended or using it for longer than you're meant to.
2. Trying to cut down or stop using the substance but being unable to.
3. Experiencing intense cravings or urges to use the substance.
4. Needing more of the substance to get the desired effect — also called tolerance.
5. Developing withdrawal symptoms when not using the substance.
6. Spending more time getting and using drugs and recovering from substance use.
7. Neglecting responsibilities at home, work or school because of substance use.
8. Continuing to use even when it causes relationship problems.
9. Giving up important or desirable social and recreational activities due to substance use.
10. Using substances in risky settings that put you in danger.
11. Continuing to use despite the substance causing problems to your physical and mental health.

Appendix B: DSM-5 2023 NSDUH Substance Use Severity Questions

Note: For the questions that have multiple variables, there are also multiple questions listed.

Criteria Number?	Question	Answer choices	NSDUH Variable
Criteria 1	During the past 12 months, were there many times when you ended up drinking alcohol in larger amounts or for a longer time than you meant to?	1 = Yes 2 = No	UDALLRGAMTS
Criteria 2	Some people who drink alcohol try to cut down or stop but find they can't. Was there more than one time in the past 12 months when you tried but were unable to cut down or stop drinking alcohol? Or In the past 12 months, did you often wish that you could cut down or stop drinking alcohol?	1 = Yes 2 = No	UDALNOTSTOP Or UDALWSHSTOP
Criteria 3	During the past 12 months, did you spend a great deal of your time getting or trying to get alcohol? Or During the past 12 months, did you spend a great deal of your time drinking alcohol, feeling its effects, or getting over the effects of drinking?	1 = Yes 2 = No	UDALTIMEGET Or UDALTIMEUSE
Criteria 4	During the past 12 months, were there times when you wanted to drink alcohol so badly that you couldn't think of anything else? Or During the past 12 months, were there times when you had a strong urge to drink alcohol?	1 = Yes 2 = No	UDALWANTBAD Or UDALSTRURGE
Criteria 5	Sometimes people who drink alcohol have serious problems at work, school, or home—such as: • missing a lot of work or school • getting demoted, having your hours cut, or losing a job • not being able to get a job or keep a job • getting suspended, expelled, or dropping out of school • failing to take care of family During the past 12 months, did you have any serious problems like these at work, school, or home because of your alcohol use?	1 = Yes 2 = No	UDALWORKPRB
Criteria 6	During the past 12 months, did you often have arguments or other problems with family or friends that were caused or made worse by your alcohol use?	1 = Yes 2 = No	UDALFMLYPRB

Criteria 7	This question is about important activities such as: • Spending time with friends and family • Attending special events at work or school • Participating in hobbies and sports • Attending religious services and events During the past 12 months, did you give up or spend a lot less time doing any of these types of important activities because of your alcohol use?	1 = Yes 2 = No	UDALSTOPACT
Criteria 8	During the past 12 months, did you repeatedly get into situations where drinking alcohol increased your chances of getting physically hurt?	1 = Yes 2 = No	UDALGETHURT
Criteria 9	Did you continue to drink alcohol even though it was causing long-lasting or repeated problems with your emotions or mental health or making your emotions or mental health worse? Did you continue to drink alcohol even though it was causing long-lasting or repeated physical health problems or making your physical health problems worse? A blackout is lack of memory. That is, you were awake, but you have no recall of the things you did or that were done to you. During the past 12 months, did you repeatedly have blackouts while drinking or after drinking alcohol?	1 = Yes 2 = No	UDALMNTlCTD Or UDALHLTHCTD Or UDALBLCKCTD
Criteria 10	Do you need to drink a lot more alcohol than you used to in order to get the feeling you want? Does drinking the same amount of alcohol have much less effect on you than it used to?	1 = Yes 2 = No	UDALNEEDMOR Or UDALESSEFF
Criteria 11	People may experience withdrawal symptoms when they drink less or stop drinking alcohol. Withdrawal symptoms are stronger and last longer than a hangover. During the past 12 months, did you have the following withdrawal symptoms after you drank less or stopped drinking alcohol for a while: Sweating or feeling that your heart was beating fast Having your hands tremble Having trouble sleeping Vomiting or having an upset stomach Seeing, hearing, or feeling things that weren't really there Feeling like you couldn't sit still Feeling anxious Which of the following did you use to get over or avoid having alcohol withdrawal symptoms during the past 12 months?	1 = Yes 2 = No	UDALWDSWEAT Or UDALWDTRMBL Or UDALWDSLEEP Or UDALWDVOMIT Or UDALWDHALUC Or UDALWDSITST Or UDALWDFLANX Or UDALABWALCO Or UDALAVWSTVTR

	Alcohol Prescriptions sedatives, tranquilizers, sleeping pills, or downers		

Appendix C: PHQ-8 Depression Criteria

Over the last 2 weeks, how often have you been bothered by any of the following problems? Answer choices: 0 = Not at all, 1 = Several days, 2 = More than half the days, 3 = Nearly every day

1. Little interest or pleasure in doing things
2. Feeling down, depressed, irritable, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as school work, reading or watching television
8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual.

Appendix D: PHQ-8 2023 NSDUH Depression Severity Question

Criteria Number?	Question	Answer choices	NSDUH Variable
Criteria 1	During that time, did you feel sad, empty, or depressed most of the day nearly every day?	1 = Yes 2 = No	AD_MDEA1
Criteria 2	During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?	1 = Yes 2 = No	AD_MDEA2
Criteria 3	Did you have a much smaller appetite than usual nearly every day during that time?	1 = Yes 2 = No	AD_MDEA3
Criteria 4	Did you have a lot more trouble than usual falling asleep, staying asleep, or waking too early nearly every night during that period of time?	1 = Yes 2 = No	AD_MDEA4
Criteria 5	Did anyone else notice that you were talking or moving slowly?	1 = Yes 2 = No	AD_MDEA5
Criteria 6	During that period of time, did you feel tired or low in energy nearly every day, even when you had not been working very hard?	1 = Yes 2 = No	AD_MDEA6
Criteria 7	Did you feel totally worthless nearly every day?	1 = Yes 2 = No	AD_MDEA7
Criteria 8	Did you have a lot more trouble concentrating than usual nearly every day?	1 = Yes 2 = No	AD_MDEA8