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Depressive Symptoms, Adverse Childhood Experiences, and Sleep Quality: Black Americans in the Rural South

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Abstract

Purpose: Adverse childhood experiences (ACEs), distrust of the healthcare system and stigma reduce mental health service use and worsen outcomes, particularly for rural adults. Evidence

mounts that ACEs and mental health conditions are linked to poor sleep, yet ACEs remain understudied in rural Southern communities where Black Americans face disproportionate racial and socioeconomic disparities. This study examined whether ACEs and depressive symptoms predict sleep quality in rural Black Americans, identified the types and frequency of ACEs reported among those with depressive symptoms, and explored correlations between sleep quality and ACEs overall and by specific type.

Method: Participants (N = 75) Black/African adults, completed a series of questionnaires including a demographic survey, Patient Health Questionnaire (PHQ-9), modified ACEs, and answered two questions assessing components of sleep quality, including sleep duration and satisfaction.

Findings: Of the 75 participants, 56% (n = 42) reported depressive symptoms. Among those with depressive symptoms, 40.5% (n = 17) reported having parents that had separated or divorced and 23.8% (n = 10) reported not feeling loved by anyone in the family and that family did not look out for each other. Sleep duration was shorter for participants who reported living with someone experiencing substance use or mental illness, $p < .05$. Adverse childhood experiences and depressive symptoms were not associated with sleep quality, all $p > .05$.

Conclusion: Community-focused interventions, specifically trauma-informed care models, are needed to address the potential impact of specific ACEs on mental health outcomes within rural Black Americans.
Keywords: rural, adverse childhood experiences, mental health, sleep quality, depression

Depressive Symptoms, Adverse Childhood Experiences, and Sleep Quality: Black Americans in the Rural South

Geographical differences in mental health care burdens exist due to several barriers and challenges in ensuring availability and access to mental health services for rural populations (e.g., lack of competent health care providers, poor health literacy, and lack of transportation to clinic sites; Mongelli et al., 2020; Lee & Boykins, 2022). According to the U.S. Census Bureau (2022), approximately 20% of the U.S. population lives in rural areas. Yet, there has been little focus on depressive symptoms within rural populations. Evidence suggests that adverse childhood experiences (ACEs), traumatic events or maltreatment during the first 18 years of life (Felitti et al., 1998), contribute to mood disorders such as depression in adulthood (Satinsky et al., 2021). Neglect, abuse, and family/household dysfunction are a few examples of ACEs (Felitti et al., 1998).

Data from the National Survey of Children's Health (NSCH, 2020) identified ACEs (e.g., living with someone with a mental illness and living with someone with alcohol or substance use disorder) that were more frequent among children in rural communities compared to those in urban areas. Adverse Childhood Events are understudied within rural communities, especially in the

South, where Black Americans are disproportionately impacted by poverty, unemployment, systemic racism, and discrimination which can lead to chronic stress and adverse health outcomes (Institute for Research on Poverty, 2020). Data from the Behavioral Risk Factor Surveillance System (BRFSS) revealed that rural survey respondents aged 18 and older who experienced at least one ACE had increased odds of reporting poor general health, activity limitations, heart disease, and mental health. (Chanlongbutra et al., 2018). Unfortunately, treatment and prevention options for ACEs are scarce in some rural communities, which can result in untreated or undertreated mental health problems that continue through adulthood.

Previous research found that greater depressive symptoms have been associated with poor sleep quality (e.g., short duration < 7 hours; Adesogan et al., 2024; Du et al., 2024). In addition, short sleep duration in later life has been linked to ACEs (Sullivan et al., 2019; Vadukapuram et al., 2022). Sullivan and colleagues (2019) found that exposure to ACEs was associated with higher odds of experiencing short sleep duration. Similarly, in a recent study of 3,873 rural adults in China, Zhang and colleagues (2024) found that anxiety mediated the relationship between ACEs and sleep quality. These findings suggest that sleep problems in adults may be linked to underlying childhood trauma. The relationship between depressive symptoms, ACEs, and sleep quality has not been explored simultaneously among adults in the rural South. Therefore, this study has three aims:

1. Examine whether ACEs and depressive symptoms (presence versus absence) predict sleep quality (hours of sleep and sleep satisfaction) in rural adults.
2. Explore type and frequency of ACEs reported among individuals with depressive symptoms living in the rural South.
3. Explore whether sleep quality correlates with ACEs overall and by specific type reported in rural adults.

By investigating these aims, our primary purpose is to contribute to the growing body of literature related to the association between depressive symptoms, ACEs, and sleep quality. We hypothesize that greater depressive symptoms will be associated with increased ACEs, and greater depressive symptoms will be associated with poor sleep quality. We hypothesize that increased ACEs will be associated with poor sleep quality. This is the first study of its kind to explore the type and frequency of ACEs reported among individuals with depressive symptoms living in the rural South.

Methods

Research Design and Sample

The study was approved by the University's Institutional Review Board. Participants were recruited from two rural counties in the Southeast via flyers placed in common areas (e.g., grocery stores). Participants interested in the study attended a one-day community health fair in August 2023. After the study procedures and risks were discussed, participants signed the informed consent. After signing the informed consent, participants were asked to complete a series of questionnaires to gather information on demographics, depressive symptoms, ACEs, and sleep

quality. Participants were compensated with a $20.00 Visa Gift Card for completing all questionnaires.

Eligibility Criteria & Analytic Sample

Inclusion criteria included being age ≥19 years old and currently living in a southern rural county.

Instruments

Demographic Survey

This is an investigator-generated survey to gather demographic data such as race, age (*in years*), gender (*female, male, transgender, other*), relationship status, highest level of education, employment status, and household income.

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 has 9-items related to depressive symptoms. Participants are asked how often they have been bothered by symptoms (e.g., little interest or pleasure in doing things) over the past two weeks. Responses range from 0 = *not at all* to 3 = *nearly every day*. Scores for each item are summed for a total score ranging from 0 to 27, with higher scores indicating worse depressive symptoms. The PHQ-9 is a reliable and valid measure of depression severity. A PHQ-9 score ≥10 had a sensitivity of 88% and a specificity of 88% for major depression (Kroenke et al., 2001). We operationalized depressive symptoms as *any* (PHQ-9 ≥ 1) versus *none* (PHQ-9 = 0) to indicate the presence or absence of depressive symptoms.

Adverse Childhood Experiences (ACEs) Questionnaire

The ACEs Questionnaire is a modified 10-item instrument used to measure childhood trauma. The questionnaire assesses types of childhood trauma (before the age of 18) such as physical abuse, verbal abuse, sexual abuse, physical neglect, emotional neglect, and household dysfunction (e.g., parental separation/divorce). Participants are asked to respond *yes* or *no* to each item. The total score is calculated by summing the number of yes responses, with scores ranging from 0 - 10 and higher scores indicating greater severity of childhood trauma. Global and U.S. studies using various data sources demonstrate that ACEs are linked to poorer social, economic, behavioral, and physical health outcomes in adulthood (Felitti et al., 1998; Finkelhor et al., 2013). The ACEs Questionnaire had good internal consistency for this sample ($\alpha = .7445$).

Sleep Quality

Participants were asked to answer two questions related to sleep quality. To assess sleep duration, participants are asked "Do you sleep 6-8 hours per day?" To assess sleep satisfaction, participants are asked "Are you satisfied with your sleep?" Participants responded 0 = *Rarely/Never*, 1 = *Sometimes*, 2 = *Always*.

Data Analysis

Descriptive statistics were used to summarize demographic, mental health, and other characteristics of the cohort using means and standard deviations for continuous variables and counts and frequencies for categorical variables. Participant characteristics were stratified by depressive symptoms using one-way ANOVA for continuous variables and chi-square and Fisher's exact tests for categorical variables. We used logistic regression to examine the association between depressive symptoms, ACEs, and sleep quality as the outcome, adjusting for age and gender. In final models, sleep quality was operationalized as rarely/never vs. sometimes or always. Correlation analyses were used to assess the relationship between sleep quality and type and frequency of ACEs. The software JMP Pro 19 (n.d.) was used for all analyses, with p values $\leq .05$ considered meaningful.

Results

Cohort Summary

The average age of participants was 56.7 years. Of the 75 participants, all (100%) were Black/African Americans, 60 (80.0%) were female, 34 (45.3%) had completed up to grade 12 of high school, and 52 (69.3%) reported an income of at most $30,000. The mean ACE score was 1.3 (SD = 1.8). The mean depression score was 3.8 (SD = 5.4), with 56% (n = 42) reporting depressive symptoms. Seventy-six percent of participants reported sleeping six to eight hours per day sometimes or always, and 88% reported being satisfied with sleep sometimes or always. Characteristics were similar by depressive symptom status, except ACEs were significantly higher on average for participants with depressive symptoms compared to those without depressive symptoms (1.7 vs 0.7, $p = .012$; see Table 1).

Table 1

Summary Statistics of Study Cohort

Characteristic	Overall N = 75	Depressive Symptoms: Any N = 42	Depressive Symptoms: None N = 33	p-value
Age, Mean (SD)	56.7 (13.0)	55.1 (13.4)	58.8 (12.4)	.221[1]
Gender, n (%)				.416[2]
Female	60 (80.0)	35 (83.3)	25 (75.8)	
Male	15 (20.0)	7 (16.7)	8 (24.2)	
Education level, n (%)				.223[2]
Grade 12 or below	34 (45.3)	17 (40.5)	17 (51.5)	
Some college/vocational school	16 (21.3)	12 (28.6)	4 (12.1)	
College degree	25 (33.3)	13 (31.0)	12 (36.4)	
Household income, n (%)				.952[2]
≤ $30,000	52 (69.3)	29 (69.0)	23 (69.7)	
≥$30,001	23 (30.7)	13 (31.0)	10 (30.3)	
Sleep Quality, Mean (SD)	6.7 (2.6)	6.3 (1.7)	7.2 (3.4)	.159[1]
ACEs, Mean (SD)	1.3 (1.8)	1.7 (2.0)	0.7 (1.3)	**.012[1]**

[1]Welch two sample t-test, [2]Pearson's chi-square test, [3]Fisher's exact test, Bold *p*-value = statistically significant at the 5% level.

Type and Frequency of Reported ACEs among Participants with Depressive Symptoms

Among those with depressive symptoms, 40.5% (n = 17) reported having parents that had separated or divorced, 23.8% (n = 10) reported not feeling loved by anyone in the family and that family did not look out for each other (see Table 2).

Table 2

ACEs Among Participants with Depressive Symptoms

ACE Item	**Overall**, N = 42[1]
1. Did you often or very often feel that no one in your family loved you or your family did not look out for each other?	10 (23.8%)
2. Did a parent or other adult in the household often or very often: Swear at you, insult you, put you down, or act in a way that makes you feel threatened?	6 (14.3%)
3. Did a parent or adult in the household often or very often push, grab, shove, or slap you?	2 (4.8%)
4. Was there frequent arguing or shouting between your parents, parents and you, and/or parents and your siblings?	7 (16.7%)
5. Would you say you were left on your own to fend for yourself growing up?	7 (16.7%)
6. Were your parents ever separated or divorced?	17 (40.5%)
7. Would you say that a parent or other adult in your household behaved violently towards a family member or visitor?	4 (9.5%)
8. In your childhood, did you live with anyone who was a problem drinker or alcoholic or who used street drugs?	7 (16.7%)
9. Did anyone living with suffer from depression, mental illness, or attempt suicide?	7 (16.7%)
10. Did anyone in your household go to prison?	4 (9.5%)

[1] N (%). ACEs = Adverse Childhood Experiences

Sleep Quality, ACEs, and Depressive Symptoms

Neither ACEs or depressive symptoms were significantly associated with sleep duration, $p = .8507$, or with sleep quality, $p = .7040$, see Table 3.

Table 3

Adjusted odds ratios for ACEs and depressive symptoms, N = 75

	Sleep Duration			**Sleep Satisfaction**		
Characteristic	**OR[1]**	**95% CI[1]**	***p*-value**	**OR[1]**	**95% CI[1]**	***p*-value**
Depressive symptoms (*ref = none*)	1.15	0.36, 3.64	.8080	.84	0.18, 3.7	.8142
ACEs	.85	0.63, 1.16	.3054	1.4	0.86, 2.92	.2083

[1]OR = Odds Ratio, CI = Confidence Interval. Models adjusted for age and gender, all $p > .05$.

ACEs and Sleep Quality

Neither sleep duration nor sleep satisfaction was significantly associated with the total ACE score, p = .1093 and .9142, respectively. Sleep satisfaction was not associated with any ACE item, all $p > .05$. Sleep duration was associated with ACE items eight and nine, both $p < .05$. Sleep

duration decreased for participants who reported living with someone who was a problem drinker or alcoholic or who used street drugs in their childhood, and for those who reported living with someone who suffered from depression, mental illness, or attempted suicide, Table 4.

Table 4

Correlation (r value) between ACEs and Sleep Quality

ACE Item	Sleep duration N = 75[1]	Sleep satisfaction N = 75[1]
1. Did you often or very often feel that no one in your family loved you or your family did not look out for each other?	-0.06	-0.03
2. Did a parent or other adult in the household often or very often: Swear at you, insult you, put you down, or act in a way that makes you feel threatened?	-0.03	0.03
3. Did a parent or adult in the household often or very often push, grab, shove, or slap you?	0.06	0.03
4. Was there frequent arguing or shouting between your parents, parents and you, and/or parents and your siblings?	-0.10	-0.01
5. Would you say you were left on your own to fend for yourself growing up?	0.03	-0.10
6. Were your parents ever separated or divorced?	-0.14	-0.01
7. Would you say that a parent or other adult in your household behaved violently towards a family member or visitor?	-0.09	0.20
8. In your childhood, did you live with anyone who was a problem drinker or alcoholic or who used street drugs?	**-0.25**	0.04
9. Did anyone living with suffer from depression, mental illness, or attempt suicide?	**-0.30**	-0.03
10. Did anyone in your household go to prison?	-0.02	-0.01

[1] Correlation coefficient. Bold correlation = statistically significant at the 5% level. *p*-value (ACE item 8 = .0297, ACE item 9 = .0092) ACEs = Adverse Childhood Experiences.

Discussion

The present study examined whether the presence of depressive symptoms and ACEs predicted self-reported sleep duration and satisfaction among adults living in the rural South. Our findings did not support the hypothesis that the presence of depressive symptoms and ACEs predict poor sleep quality within Black Americans in the rural South. Our results oppose those of other studies that suggest an association between ACEs, depressive symptoms, and sleep disturbances in adulthood (Fang et al., 2019; Yasugaki et al., 2023). Given rural Black Americans often experience heightened racial and socioeconomic disparities including limited healthcare access (Harrell et al., 2025; Williams et al., 2019), these factors may attenuate or exacerbate the relationship between early-life adversity and sleep quality in this population. The historical

associations found between depressive symptoms, ACEs, and sleep quality reinforce the need for larger studies to investigate the cumulative burden of early-life adversity in shaping health outcomes, especially among rural Black Americans living in impoverished communities.

Prior studies have established a direct association between ACEs and sleep dysregulation (Beilharz et al., 2020; Chapman et al., 2013; Haj-Yahia et al., 2019; Xiao et al., 2020). Findings from this study address important gaps in the literature by examining the association between sleep duration and specific types of ACEs (i.e., living with someone who was an alcoholic or who used street drugs and living with someone who suffered from depression, mental illness, or suicide) reported by Black Americans in the rural South. Such experiences can lead to hyperactivation of the hypothalamic-pituitary-adrenal (HPA) axis, a biological mechanism often linked to depressive disorders and sleep disturbances (Iob et al., 2020; Mikulska et al., 2021). These findings underscore the need for interventions that address childhood adversity, promote adaptive coping strategies, and improve access to mental health services (Ellis et al., 2022; Joo & Liu, 2021). Future research should explore potential mediators and moderators of these relationships, such as social support and economic stressors, to better understand their role in mental health. A follow up qualitative study may also be beneficial for understanding social and structural factors related to specific ACEs reported and sleep duration.

Study findings emphasize the critical role of early-life instability in shaping adult sleep outcomes, particularly within rural Black Americans, who often face additional systemic barriers, such as limited access to mental health services, systemic racism, neighborhood crime, violence, economic hardship, and sociocultural stigma surrounding healthcare services (Alang, 2019). The high prevalence of these ACEs suggests the need for tailored interventions to prevent or minimize childhood trauma and address both the long-term psychological impact of childhood adversity and the structural challenges unique to rural Black Americans. While underexplored, trauma-informed therapies (e.g., narrative therapy and family-based trauma therapy) can address systemic inequities and psychological effects, including intergenerational trauma, experienced by rural Black families (Chin et al., 2023). In addition, trauma-informed care models in primary care clinics may improve uptake in childhood trauma screening, tailored treatments, and mental health outcomes for Black Americans living in rural communities with limited mental health care access (Bernard et al., 2021; Roberts et al., 2019). Culturally responsive trauma-informed trainings can help healthcare providers and trusted rural community leaders (e.g., pastors) recognize and respond to various trauma experienced by Black Americans, while minimizing the risk of re-traumatization.

Strengths and Limitations

While there are several strengths of this study including the use of validated measures adults Americans with depressive symptoms, this study is not devoid of limitations. First, our cross-sectional study design did not allow for an examination of changes in variables over time. Therefore, we were not able to capture mental health trends. Second, there is potential for recall and non-response biases since participants may not be able to recollect past traumatic experiences. Furthermore, participants may not feel comfortable reminiscing about past events. Finally, our

study employed self-report instruments. These subjective measures can lead to reporting bias whereby participants under or over-report sleep problems. The inclusion of objective metrics will enhance the overall quality of research findings by reducing bias. Finally, the modified ACE questionnaire did not assess racism as an adverse childhood exposure risk factor, which is important for rural Black Americans in the southern Black Belt, a region deeply rooted and shaped by systemic inequities.

Implications for Research in Mental Health and Policy

Our study further highlights the unique vulnerability of rural Black Americans, who disproportionately experience socioeconomic barriers and psychological stressors such as racial discrimination, which can lead to higher prevalence of chronic diseases (Littleton et al., 2025). These barriers can exacerbate the long-term mental health consequences of childhood trauma (Pumariega et al., 2022; Williams, 2018). The observed association between short sleep duration and specific ACEs reported suggest that sleep problems in rural Black Americans may be due to specific traumatic childhood experiences related to household members using alcohol, street drugs, and/or suffering with mental illness. Adesogan et al. (2024) and Du et al. (2024) reported that short sleep duration is linked to increased depressive symptoms in adults, which can also lead to poor sleep. Our study emphasizes this knowledge by focusing on rural Black Americans in the South, emphasizing the need for trauma-informed strategies and sleep interventions as part of comprehensive mental health care.

The findings of this study underscore the urgent need for tailored mental health interventions that prevent or minimize the impact of ACEs on depression and sleep quality in rural Black Americans. Given the limited access to mental health care in rural areas, policies should prioritize expanding community-based services, integrating trauma-informed care in primary health settings, and increasing telehealth accessibility to bridge the care gap. Routine ACE screening should be implemented in primary care and mental health services to identify at-risk individuals early. Additionally, culturally responsive interventions, such as faith-based counseling, peer mentoring, and Afrocentric wellness models, should be explored to improve mental health outcomes in historically underserved communities. More studies are needed to examine the biopsychosocial mechanisms linking ACEs, depressive symptoms, and sleep disturbances, particularly within rural minorities. Future research should also evaluate the effectiveness of telehealth and digital mental health interventions in addressing depression and sleep disparities within rural Back Americans.

Conclusion

Within this sample of rural Black Americans, more than half of the participants had depressive symptoms further suggesting geographical disparities in mental health. Study findings supported our hypothesis that higher depressive symptoms were associated with worse sleep quality and greater childhood trauma. Opposed to our hypothesis, study findings revealed that ACEs were not associated with poor sleep quality this population in the rural South. Specific ACEs correlated with sleep duration, thus highlighting the need to address childhood trauma as a

potential underlying cause of poor sleep quality within rural Black Americans. Longitudinal studies examining socio-structural mechanisms linking depressive symptoms, childhood trauma, and sleep quality are warranted.

Conflict of Interest

The authors declared no conflict of interest, financial or otherwise.

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