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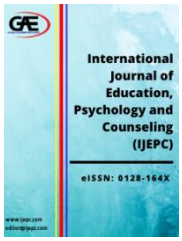

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DEPRESSION AND ANXIETY DURING COVID-19 AMONG ADULTS AT RURAL MENTAL HEALTH AGENCY

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Abstract:

This quantitative archival cross-sectional study examined depression and anxiety symptomatology among adults receiving outpatient behavioral health services in a rural region of the Midwestern United States during the COVID-19 pandemic. Archival data from the *Patient Health Questionnaire-4 (PHQ-4)* were analyzed for 322 adult clients who worked at a community mental health agency between June 2020 and June 2022. Descriptive and inferential analyses were conducted to assess symptom severity and explore gender-based differences. The average *PHQ-4* score was 5.56 (*SD* = 3.79), reflecting mild to moderate psychological distress across the sample. Females reported significantly higher scores (*M* = 5.96, *SD* = 3.81) than males (*M* = 5.01, *SD* = 3.72), with small but consistent effects observed across *t-test*, *ANOVA*, and *Mann-Whitney U* analyses. These findings align with broader evidence of heightened pandemic-related mental health burden, particularly among women, and suggest that rural adults, who often face geographic, socioeconomic, and technological barriers to care, may be at increased risk. By applying standardized screening tools within an underserved setting, this study contributes to the rural mental health literature by documenting clinically meaningful gender disparities in psychological distress. The results support the need for targeted, gender-responsive mental health interventions and underscore the importance of scalable screening practices in crisis response. Implications for service delivery, policy development, and future research are discussed in the context of improving rural behavioral health infrastructure and addressing disparities exacerbated by public health emergencies. This study uniquely contributes to the rural mental health literature by using standardized measures to document gender disparities in psychological distress during a public health crisis, emphasizing the practical value of scalable tools in underserved areas.

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COVID-19 Pandemic, Depression, Anxiety, Rural Behavioral Health, Mental Health Disparities

Introduction

The COVID-19 pandemic has had a profound global impact on mental health, with elevated rates of depression, anxiety, and psychological distress reported across nearly every population subgroup (Banerjee et al., 2021; Killgore et al., 2020; Pierce et al., 2021). While much of the early research and media attention focused on urban centers, growing evidence suggests that rural populations have faced disproportionate burdens due to systemic inequities in healthcare access, digital infrastructure, and mental health service availability (Brown & Schuman, 2021; Hung et al., 2020). The combination of geographic isolation, provider shortages, and social stigma surrounding mental illness has created persistent barriers to care in rural communities—barriers that were intensified during the pandemic.

Before COVID-19, approximately 60% of rural Americans lived in areas with a shortage of mental health professionals (Health Resources and Services Administration [HRSA], 2021). Compared to urban populations, rural residents are more likely to experience delayed treatment, reduced access to specialty care, and more incredible difficulty navigating telehealth services due to broadband limitations and digital illiteracy (Pierce et al., 2021; Resnick et al., 2020). These access issues have coincided with increased stress, economic instability, and social isolation, factors linked to greater risk for depression, anxiety, and suicidal ideation (Guan et al., 2022; Saltzman et al., 2020). However, despite these challenges, few studies have documented how these symptoms present within rural behavioral health settings during the pandemic.

In addition to geographic disparities, gender-based differences in mental health outcomes have emerged as a consistent theme in pandemic-related research. Women have reported higher levels of depression and anxiety than men across numerous studies, with contributing factors including caregiving burdens, domestic stress, and increased exposure to interpersonal violence (Aberese-Ako et al., 2022; Islam et al., 2023). However, limited data exist on how these disparities manifest within rural outpatient populations.

This study addresses these gaps by analyzing symptom data from a rural community behavioral health agency in the Midwestern United States during the COVID-19 pandemic. Using archival *Patient Health Questionnaire-4 (PHQ-4)* scores, we examined the overall prevalence of depression and anxiety symptoms and explored gender differences in symptom severity. Based on prior research and theoretical considerations, we hypothesized that females would report significantly higher levels of depression and anxiety than males. By applying standardized screening measures within an underserved setting, this study contributes to the rural mental health literature. It informs gender-sensitive strategies for improving access to care during public health crises.

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Literature Review

This study is grounded in the *Stress and Coping Theory* developed by Lazarus and Folkman (1984), which conceptualizes psychological stress as a dynamic interaction between the individual and their environment. Within this framework, distress arises when perceived demands exceed coping resources, mainly when stressors are sustained, and resources are limited. The COVID-19 pandemic introduced multiple compounding stressors, including health threats, isolation, financial instability, and increased caregiving responsibilities, that overwhelmed individuals' coping systems. Rural populations, already facing historical underinvestment in mental health infrastructure, encountered intensified challenges due to service shortages, geographic barriers, and technological inequities (Hwang et al., 2022; Saltzman et al., 2020). *Stress and Coping Theory* thus provides a helpful lens for understanding how pandemic-related distress may have been magnified in rural communities, where adaptive coping resources were structurally and socially constrained.

A substantial body of research has confirmed widespread increases in depression and anxiety during the pandemic, yet these studies have predominantly focused on urban samples or large-scale national surveys (Banerjee et al., 2021; Killgore et al., 2020). In contrast, rural communities remain underexamined despite evidence suggesting they are particularly vulnerable to psychological stress. Rural residents often report higher levels of untreated mental health conditions due to reduced provider availability, stigma around seeking help, and lower mental health literacy (Brown & Schuman, 2021; Tarlow et al., 2019). The pandemic further strained this already limited infrastructure, while proposed solutions like telehealth were not uniformly effective. Although telepsychology expanded access in many urban settings, rural residents frequently encountered barriers such as poor broadband coverage, limited digital literacy, and discomfort with virtual platforms, undermining the potential of these services (Pierce et al., 2021; Resnick et al., 2020). While these studies identify key barriers, few integrate *Stress and Coping Theory* to contextualize how such environmental constraints translate into sustained psychological distress. This study applies a theoretical framework to interpret symptom prevalence and the compounded effects of limited coping resources and rural stressors. These contrasts raise critical questions about whether pandemic-era strategies adequately served the mental health needs of rural populations.

Gender has emerged as another key dimension in pandemic-related mental health disparities. Consistently, women have reported higher levels of depression and anxiety than men during the pandemic, a trend attributed to unequal caregiving burdens, increased exposure to interpersonal violence, and more significant occupational disruption (Aberese-Ako et al., 2022; Islam et al., 2023). From a theoretical standpoint, women may experience more significant cumulative stress and fewer structural supports, increasing their psychological vulnerability during times of crisis. In rural settings, these gendered dynamics are further compounded by traditional gender role expectations and diminished access to women-focused mental health resources. However, despite growing recognition of gender disparities in urban and national data, research documenting these patterns, specifically within rural behavioral health systems, remains limited. Few studies have disaggregated mental health outcomes by gender within outpatient rural care, and even fewer have employed standardized symptom screening tools to do so.

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The *Patient Health Questionnaire-4 (PHQ-4)* offers an efficient, validated instrument for screening depression and anxiety symptoms across diverse populations (Kroenke et al., 2021). Its brevity and psychometric soundness make it especially valuable in high-demand or resource-limited settings like rural outpatient clinics. During the pandemic, the *PHQ-4* has been increasingly used to assess psychological distress. However, few studies have reported its application in rural clinical contexts or analyzed gender-based patterns in its results. This study addresses these intersecting gaps by applying the *Stress and Coping Theory* to interpret symptom data from rural adults receiving care during the pandemic. It contributes to the literature by documenting the prevalence and gender distribution of psychological symptoms in an underserved population using a standardized, scalable measure. The findings are intended to inform future research and policy and intervention strategies that address the unique stressors facing rural communities, particularly during public health crises.

This study contributes to the existing COVID-19 mental health literature body by addressing notable gaps in rural outpatient data. Unlike national surveys or urban centered analyses, this study draws on clinical records from a rural mental health agency. It employs a validated screening tool *(PHQ-4)* to examine gender-specific distress patterns. It expands empirical knowledge on how geographic and gender-based disparities intersect within under-resourced settings during a crisis.

Methodology

Population and Setting

The target population for this study included adults aged 18 years and older who received outpatient behavioral health services from a rural community mental health agency located in the Midwestern United States during the COVID-19 pandemic. Rural populations often face heightened mental health risks due to geographic isolation, limited provider access, and socioeconomic instability, conditions exacerbated by the public health crisis.

Sampling and Sample Size Justification

This study used a purposive sampling approach, drawing on existing client data from the agency's electronic health records. The final sample consisted of 322 adults who completed the PHQ-4 screening tool during active treatment between June 1, 2020, and June 30, 2022. Although the sampling frame was predetermined due to the archival nature of the dataset, an a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2009). Assuming a small effect size ($d = 0.30$), an alpha level of .05, and a power of .80 for two-tailed tests, the minimum required sample size was estimated to be 74 participants. The final sample exceeded this threshold, enhancing the findings' statistical power and generalizability within the rural clinical context.

Data Sources and Procedures

Archival data were obtained from electronic health records maintained by the rural behavioral health agency. After securing formal approval from the agency's leadership, de-identified client data were transmitted for analysis. No personally identifiable information was shared, and an Institutional Review Board (IRB) exemption was granted due to the use of de-identified secondary data. Data fields included client age, gender, race/ethnicity, and *PHQ-4* scores.

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Instrumentation

The *Patient Health Questionnaire-4 (PHQ-4)* was used to assess symptoms of depression and anxiety. The PHQ-4 is a validated brief screening tool composed of two depression items (*PHQ-4*) and two anxiety items (*GAD-2*), each scored on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), with total scores ranging from 0 to 12 (Kroenke et al., 2021). Established clinical cutoffs were used to categorize overall psychological distress:

- 0–2 = Normal
- 3–5 = Mild
- 6–8 = Moderate
- 9–12 = Severe

These categories were used in the descriptive analysis and subgroup comparisons to explore prevalence patterns and severity distribution across the sample.

Data Analysis

Descriptive statistics were used to summarize sample demographics and symptom severity. Independent sample *t*-tests, Mann-Whitney *U* tests, and one-way ANOVA were conducted to evaluate group differences, particularly by gender. Statistical significance was set at $\alpha = .05$. Assumption testing (Shapiro-Wilk for normality and Levene's test for homogeneity of variance) informed the choice between parametric and nonparametric analyses. Effect sizes (Cohen's *d* and η^2) were calculated to assess the practical significance of group differences and to complement p-values, providing a clearer picture of the magnitude and clinical relevance of observed effects.

Results

The researchers analyzed data using IBM SPSS Statistics (Version 27). Descriptive statistics were computed to summarize demographic characteristics and *PHQ-4* symptom scores. Inferential analyses included independent samples *t*-tests, one-way analysis of variance (*ANOVA*), and the Mann-Whitney *U* test, with statistical significance set at $\alpha = .05$. Effect sizes were calculated using Cohen's *d* and η^2 to quantify the magnitude of group differences.

Assumption Testing

Prior to conducting parametric analyses, statistical assumptions were assessed. The Shapiro-Wilk test indicated a violation of the normality assumption for *PHQ-4* scores across gender groups ($p < .05$), and Levene's test showed unequal variances, suggesting heterogeneity. Consequently, nonparametric tests were used to confirm parametric findings, ensuring the robustness of results despite these violations.

Descriptive Statistics

The final sample consisted of 322 adult clients (138 males [42.86%], 184 females [57.14%]) who received outpatient services at a rural community behavioral health agency between June 1, 2020, and June 30, 2022. Participants ranged in age from 19 to 83 years ($M = 44.87$, $SD = 14.35$), with the majority (91.61%) under age 65. Racial/ethnic representation was diverse, with participants identifying as White (47.20%), Hispanic (23.60%), Mexican/Mexican American (19.25%), Black/African American (4.04%), American Indian (4.66%), or other (1.24%) (Table 1 and Table 2).

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Table 1
Frequencies and Percentages for Gender

Gender	*n*	*%*
Male	138	42.86
Female	184	57.14

Table 2
Summary Statistics for Age

n	*Min*	*Max*	*M*	*SD*
322	19.0	83.0	44.87	14.35

PHQ-4 Severity Scores

The mean PHQ-4 score for the entire sample was 5.56 (*SD* = 3.79), indicating mild to moderate psychological distress (Table 3). PHQ-4 scores were categorized using established cutoffs (Kroenke et al., 2021):

- Normal (0–2)
- Mild (3–5)
- Moderate (6–8)
- Severe (9–12)

Distribution across these categories showed that 27.64% of participants reported normal symptom levels, 23.91% reported mild symptoms, 22.67% moderate, and 25.78% severe (Table 4). These findings suggest that a notable proportion of clients presented with clinically significant symptoms during the pandemic.

Table 3
Summary Statistics for PHQ-4 Scores

n	*Min*	*Max*	*M*	*SD*
322	0.0	12.0	5.56	3.79

Table 4
Frequencies and Percentages for PHQ-4 Categories

PHQ-4 Category	*n*	*%*
Normal	89	27.64
Mild	77	23.91
Moderate	73	22.67
Severe	83	25.78

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Gender Differences in Psychological Distress

To examine whether symptom severity differed by gender, an independent samples *t*-test was conducted. Results indicated that females (M = 5.96, SD = 3.81) reported significantly higher PHQ-4 scores than males (M = 5.01, SD = 3.72), *t-test* = -2.23, p = .026. The effect size (Cohen's d = 0.25) indicated a small, yet meaningful, difference in symptom burden by gender.

Given the violation of the normality assumption, a Mann-Whitney *U* test was performed to confirm the robustness of this difference. Results were consistent with the *t*-test, showing a significant gender difference in *PHQ-4* scores, Z = -2.22, p = .027, with females having a higher mean rank (171.42) than males (148.27).

To further validate these findings, a one-way *ANOVA* was conducted, revealing a significant main effect of gender on *PHQ-4* scores, $F(1, 320) = 4.98$, p = .026. The effect size for this comparison ($\eta^2 = 0.015$) corresponded to a small to moderate effect, reinforcing the consistency and relevance of gender-based differences in psychological distress during the pandemic.

Discussion

The findings of this study align with a growing body of evidence demonstrating elevated psychological distress during the COVID-19 pandemic, particularly among women. Rather than reiterating symptom scores, these results warrant interpretive attention to the sociocultural and structural dynamics that may have contributed to gender disparities in rural mental health outcomes.

Women in rural communities likely experienced compounded stress due to the intersection of traditional gender roles and the unique challenges of the pandemic. Increased caregiving responsibilities, disruptions in employment, and reduced access to childcare placed additional burdens on many women, exacerbating existing mental health vulnerabilities. Furthermore, rural areas often lack gender-responsive services and have limited local resources to buffer such stress. Social isolation, reduced access to formal support, and the informal expectation that women manage household emotional well-being may have further intensified distress.

Applying *Stress and Coping Theory* (Lazarus & Folkman, 1984) offers a conceptual lens through which these findings can be understood. The theory emphasizes that psychological symptoms emerge when perceived environmental demands exceed available coping resources. In this context, rural women may have faced disproportionate exposure to pandemic-related stressors with few structural supports, leading to sustained emotional strain. It is also possible that women's greater likelihood of emotional expressiveness and help-seeking contributed to higher self-reported symptom levels, a pattern previously noted in gender research (Schachter et al., 2022).

Strengths of the Study

This study contributes meaningfully to the literature on rural mental health during crisis contexts by using a validated, scalable instrument (*PHQ-4*) to assess psychological distress in an underrepresented population. Its application within a real-world clinical setting strengthens ecological validity, and including gender comparisons provides important insights for equity-oriented mental health planning.

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Limitations

Despite its contributions, several limitations should be acknowledged. First, using archival data limits control over how and when assessments are administered, reducing temporal precision. Second, data were collected from a single rural behavioral health agency, limiting the generalizability of results to other regions or healthcare settings. Third, the cross-sectional design precludes conclusions about causality or symptom changes over time. Longitudinal studies are needed to assess symptom trajectories and determine whether distress fluctuated with different phases of the pandemic. Fourth, while gender differences were analyzed, intersectional variables, such as race/ethnicity, age, and socioeconomic status, were not examined in combination. These interactions may reveal more profound structural inequalities that influence mental health outcomes and warrant further exploration in future studies.

Additionally, the reliance on self-report data may introduce reporting bias, and the absence of socioeconomic data precludes deeper analysis of how financial instability may have intersected with mental health outcomes.

Future Directions and Implications

Future research should incorporate longitudinal, mixed-methods design to explore symptom prevalence and how individuals in rural areas interpret and respond to sustained crisis-related stress. Integrating qualitative interviews would deepen our understanding of lived experiences and coping mechanisms, especially in populations with pervasive structural barriers.

Comparative studies between rural and urban outpatient populations or between those with and without telehealth access could clarify context-specific intervention needs. Investigating how digital access and literacy affect engagement with virtual care is especially urgent as telepsychology becomes a permanent fixture in mental health service delivery.

Clinically, these findings underscore the need for culturally and contextually responsive services in rural areas, particularly for women. Community-based, trauma-informed approaches expanded access to virtual care, and targeted outreach to reduce stigma are critical. Policymakers must prioritize funding to strengthen rural mental health infrastructure, including broadband expansion, provider recruitment, and integrated care delivery models.

Recommendations and Conclusion

The findings of this study underscore the urgent need for proactive, equity-driven responses to mental health disparities in rural communities, particularly among women, during and beyond public health crises. While structural inequities in access to care have long challenged rural systems, the COVID-19 pandemic magnified these gaps, revealing where targeted policy, clinical innovation, and outreach are most needed.

Based on this study's results and contextual factors, the following actionable strategies are recommended to improve rural mental health infrastructure:

- Develop gender-responsive mental health interventions that address caregiving burdens, economic instability, and social isolation, everyday stressors disproportionately affecting rural women.
- Expand telehealth access and literacy in rural areas, particularly those with limited broadband connectivity or digital fluency.

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- Invest in scalable screening tools like the *PHQ-4* for efficient symptom detection across outpatient settings.
- Enhance provider recruitment and retention in rural behavioral health systems through incentives and integrated care models.
- Support community-based mental health education and stigma-reduction campaigns through partnerships with schools, clinics, and local organizations.
- Encourage mixed-methods and longitudinal research to capture the evolving nature of psychological distress and service engagement in rural contexts.

By integrating these recommendations into local and national planning efforts, stakeholders can ensure more resilient, inclusive care systems capable of responding to future crises.

In conclusion, this study provides timely evidence of the disproportionate psychological toll borne by rural populations during the COVID-19 pandemic. The gender-based differences in symptom severity further emphasize the need for tailored strategies that reflect the unique vulnerabilities of rural women. As public health systems evolve post-pandemic, targeted, gender-informed interventions are critical in rural mental health systems to promote equitable recovery and long-term well-being.

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