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Pathways Linking Poverty and Mental Health: Causal Mediation Analysis in Southern Appalachia

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Poverty is a known risk factor for poor mental health in rural areas, where limited resources exacerbate challenges like food insecurity, housing instability, discrimination, and inadequate mental health care, though the specific mechanisms remain underexplored. This study aims to examine the mediating role of social determinants of health, including food insecurity, housing instability, mental health care access, stress, social support, and discrimination, in the relationship between poverty and poor mental health in Southern Appalachia. Repeated cross-sectional data from two waves of the Community Health Needs Assessment panel survey in 2021 and 2024 were analyzed. Mediators included food insecurity, housing instability, mental health care access, stress, social support, and discrimination. A counterfactual four-way decomposition mediation model assessed the direct and indirect effects of poverty on mental health for each mediator and relevant covariates. Stress emerged as a key mediator, with a controlled direct effect (CDE) risk ratio (RR) of 1.11, potentially eliminating 48.6% of poverty–mental health disparities. Food insecurity ($CDE_{RR} = 1.13$) could mitigate 37.3% of disparities, while housing insecurity ($CDE_{RR} = 1.12$) could reduce 42.6%. Mental health care access ($CDE_{RR} = 1.14$) could lower disparities by 33.4%. Discrimination ($CDE_{RR} = 1.13$) and a lack of social support ($CDE_{RR} = 1.15$) also significantly mediated the poverty–mental health link, with potential disparity reductions of 27.1% and 32.1%, respectively. Targeting food security, housing stability, and mental health care access through community and health care infrastructure represents a critical pathway for reducing poverty-related mental health disparities in Southern rural Appalachia, offering actionable strategies for policymakers and clinical practice.

Public Health Significance Statement

This study highlights how poverty contributes to poor mental health in Southern Appalachia, with stress, food and housing insecurity, health care access, social support, and discrimination acting as key mediators. Addressing these social determinants through community-driven solutions can reduce disparities and improve mental well-being in underserved rural communities, offering mental health providers, community organizers, and policymakers insights into asset-based strategies for more effective and sustainable interventions.

Keywords: poverty, mental health, social determinants of health, mediational analysis, rural communities

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The present study is approved by the Human Subjects Research Institutional Review Board at North Carolina State University. As this was a secondary data analysis, informed consent was not required.

The authors declare that they have no conflicts of interest.

continued

Mental health disparities in rural Southern Appalachia are shaped by the region's unique social, cultural, and community assets. Although Southern Appalachian communities demonstrate resilience through strong social networks, collective support systems, and cultural identity, persistent poverty and limited access to health care, education, and economic opportunities heighten the risk of poor mental health outcomes (Behringer & Friedell, 2006; Marshall et al., 2017). Prior research highlights elevated rates of anxiety, depression, and substance use disorder in rural areas, particularly among low-income populations (Burns, 2015; Ridley et al., 2020).

Existing literature has established that food insecurity and housing instability exacerbate mental health challenges (Garnham et al., 2022; Martin et al., 2016), while access to social support and mental health care mitigate these effects (Kawachi & Berkman, 2001; Morales et al., 2020; Thoits, 2011). Furthermore, discrimination, a critical social determinant of health (SDoH), remains understudied in this population, despite its role in compounding mental health challenges and fostering mistrust in health care systems (Burns, 2009; Schmitt et al., 2014). In the present study, these factors were selected as key mediators based on both their theoretical relevance within established social determinants of mental health frameworks and their empirical salience within the study region. Specifically, food insecurity, housing instability, social support, discrimination, stress, and access to mental health care were consistently identified as leading concerns by residents and public health leaders through the 18-county regional Community Health Needs Assessment in Western North Carolina, a region located within Southern Appalachia. However, few studies have investigated these factors simultaneously as mediators in the poverty–mental health relationship, particularly in the sociocultural context of rural Southern Appalachia.

This study aims to conduct a causal mediation analysis to examine how poverty influences poor mental health outcomes in rural Southern Appalachia through six key mediators: food insecurity, housing instability, stress, discrimination, social support, and mental health care access. By addressing these pathways, the study seeks to inform targeted interventions that mitigate mental health disparities while leveraging the strengths and assets of rural Appalachian communities. This research will fill critical knowledge gaps by highlighting the interconnected roles of social determinants and identifying actionable local and community-based strategies to reduce mental health inequities. The findings aim to advance understanding of how structural inequities intersect with community resilience to shape mental health outcomes, contributing to context-specific interventions for rural populations.

Method

Data were obtained from an ongoing, repeated cross-sectional regional Community Health Needs Assessment conducted every 3 years across 18 Western North Carolina counties in Southern Appalachia, spanning five waves from 2012 to 2024. For this analysis, only 2021 and 2024 data were used based on available mediators. Stratified random sampling ensured diverse demographic representation, with results generalized to the region (margin of error: ±1.3%, 95% CI). Regional-level data excluded records missing key health outcomes or social determinants. Poststratification weighting adjusted for selection biases, nonresponse, and demographic disparities (Gary, 2007).

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Exposure Measure: Poverty

In this study, poverty was defined as the exposure variable, with total household income quartiles used to categorize residents into different income groups. These quartiles allow for an examination of income disparities to explore the direct and indirect effects of poverty on mental health outcomes. The quartiles for total household income were as follows: *Q1—lowest income* (2021: ≤$30,199; 2024: ≤$25,599); *Q2—low-income* (2021: $30,200–$51,899; 2024: $29,600–$60,399); *Q3—middle-income* (2021: $51,900–$86,899; 2024: $60,400–$101,099); and *Q4—high-income* (2021: ≥$86,900; 2024: ≥$101,100). The lowest income group, representing individuals most at risk of experiencing poverty, served as the key area of focus for understanding how poverty impacts mental health, particularly through mediating factors such as food insecurity, housing instability, and limited access to mental health services.

Outcome Measure: Poor Mental Health

Poor mental health was measured using a self-reported survey item adapted from the Behavioral Risk Factor Surveillance System, which asks respondents to report the number of poor mental health days in the past 30 days. This measure is widely used in population-based surveillance and has demonstrated good reliability and validity across diverse populations (Moriarty et al., 2003, 2009). Based on exploratory distributional analyses (Procedure Univariate) of the study population, a cut point of seven or more days falling between the median and upper quartile was used to identify respondents experiencing persistent psychological distress. A secondary threshold of 14 or more days, often used to define frequent mental distress, was also analyzed based on the literature (Pickens et al., 2018).

Covariates

Several factors influencing the poverty–mental health relationship were included as covariates in the mediation model, such as insurance coverage (yes [referent]/no), sex (male [referent]/female), age group (18–34 years [referent], 35–54 years, 55–64 years, 65+ years), educational attainment (some high school, high school degree, some college, college degree [referent], postgraduate degree), urbanity (urban [referent], suburban, rural), number of children in the household (no children [referent], 1–2 children, 3+ children), and race/ethnicity (non-Hispanic White [referent], non-Hispanic Black/African American, Hispanic, American Indian/Alaska Native, other). Rural–Urban Commuting Area (RUCA) codes at the county scale were used to define urbanity using the following coding schema: urban (RUCA Codes 1–3), suburban (RUCA Codes 4–6), and rural (RUCA Codes 7–9; U.S. Department of Agriculture, Economic Research Service, 2013). Additional variables on health status included self-reported health status (excellent, very good, good vs. fair, poor), obesity (obese/not obese), chronic condition (including diabetes, prediabetes, high blood pressure, cholesterol, lung disease, stroke, asthma), smoking cigarettes (every day, some days, not at all), and binge drinking (5+ drinks for men, 4+ for women; yes/no). These variables, predefined in the regional health survey, are known contributors to both poverty and mental health outcomes.

Including these covariates provides a more comprehensive understanding of how these factors, alongside the mediators, influence the poverty–mental health relationship. These variables were hypothesized as confounders in the pathway between poverty and mental health (X→Y), poverty and mediators (X→M), and mediators and poor mental health (M→Y). Controlling for these covariates isolates the mediators' effects on the poverty–mental health relationship, enabling more accurate estimates of indirect pathways.

Mediators

The analysis examined six mediators to investigate mechanisms linking poverty to poor mental health. Stress was categorized as "stressed" for respondents who reported their days as "extremely" or "very" stressful and "not stressed" for those reporting less stress. Food insecurity was measured as a binary variable indicating insufficient food access (yes/no). Housing instability identified individuals "always" or "usually" worried about affording housing versus those "seldom" or "never" worried. Access to mental health care was assessed by whether respondents needed mental health support in the past year but were unable to access it. Social support was categorized as "yes" for individuals who "always" or "usually" received needed social and emotional support versus "no" for those who "never" or "seldom" did. Discrimination,

assessed during the 2024 survey wave, measured experiences of harassment, institutional discrimination in health care or education, or physical symptoms attributed to discrimination.

These mediators were chosen for their theoretical relevance to the SDoH framework and to illuminate indirect pathways between poverty and mental health. Each mediator was analyzed individually to isolate its unique contribution, avoiding the confounding effects of intercorrelations in a single multiple mediation model (MacKinnon et al., 2007). This approach enables clear identification of specific intervention opportunities, addressing gaps in research on independent mediators' effects among the rural poor.

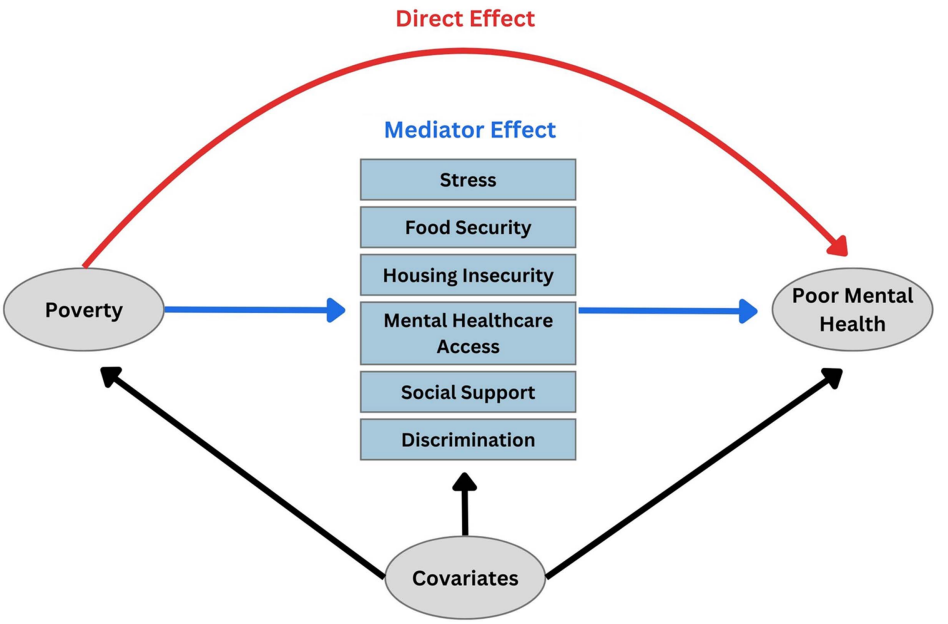
Statistical Analyses

Descriptive statistics were conducted to summarize survey data and examine differences across groups. Mean values were calculated for continuous variables, and group comparisons for categorical variables were assessed using chi-square goodness-of-fit tests. The analyses were performed using the Procedure for Survey Frequency Analysis in the Statistical Analysis Systems, incorporating survey weights to account for the complex survey design and ensure population-representative estimates.

Mediation analyses were conducted using the Procedure for Casual Mediation Analysis in Statistical Analysis Systems to examine the relationship between poverty (exposure) and poor mental health (outcome). Our conceptual framework for the analysis is shown in Figure 1. This approach allowed for the decomposition of the total effect into direct and indirect effects, mediated through several pathways: stress, food insecurity, housing instability, social support, access to mental health care, and discrimination. Separate models were used for each mediator to assess their unique contributions.

Analyses adjusted for insurance status, age, urbanity, number of children, and race/ethnicity to address confounding. Survey weights accounted for the complex survey design, ensuring

Figure 1
Conceptual Framework for Causal Mediation Analysis



Note. The figure shows the conceptual framework for the causal mediation analysis model examining the mediation effect of select social determinants of health—discrimination, food insecurity, housing insecurity, social support, stress, and access to mental health services—on the relationship between poverty (exposure of interests) and poor mental health (outcome of interests). See the online article for the color version of this figure.

representative results. We employed a counterfactual mediation analysis approach. This method offers several advantages over traditional linear structural equation modeling: It allows for causal mediation effects to be defined independently of a specific statistical model, decomposes the total effect even when exposure–mediator interactions exist, and extends to nonlinear models (VanderWeele, 2016). Additionally, it enables sensitivity analyses to assess the robustness of the results against potential violations of key assumptions (Imai et al., 2010).

This approach decomposes the total effects of poverty on poor mental health into natural direct and indirect effects and quantifies the proportion of the relationship mediated by each SDoH, estimated using maximum likelihood estimation and the δ method. A four-way decomposition approach further evaluates exposure–mediator interactions (VanderWeele, 2016). Sensitivity analyses explored sex-based differences, alternative definitions of poor mental health, and subgroup analyses for low-income versus high-income groups. All analyses were performed in Statistical Analysis Systems (SAS Institute Inc., 2013).

Ethical approval for this study was granted by the North Carolina State University Institutional Review Board (Protocol Number 27048). This research was conducted under the project titled *Integrating Climate Impacts Into a Community Health Assessment for Rural Communities.* All procedures adhered to ethical guidelines for human subjects research.

Results

Table 1 presents the characteristics of Western North Carolina in a sample of 11,150 respondents. Overall, a higher proportion of individuals who self-reported poor mental health were aged 18–34, female, White, and uninsured compared to the total sample. Figure 2 shows the spatial distribution of poor mental health throughout the region.

Table 2 presents the four-way decomposition results of mediated effects for each SDoH. Each mediator significantly contributed to the association between poverty and poor mental health in rural Southern Appalachia. We focused on the controlled direct effect (CDE) and percentage eliminated (PE) to highlight policy and intervention relevance. A CDE greater than one indicates poverty independently increases the risk of poor mental health, even after accounting for an individual mediator.

Stress emerged as a key mediator, with a CDE revealing a risk ratio (RR) of 1.11 (95% CI [1.08, 1.14]) and an estimated 48.6% of the mental health disparities eliminated by addressing stress-related factors. Food insecurity also played an important role, suggesting that individuals in the lowest income group had a 13% higher risk of poor mental health compared to those in the highest income group (RR = 1.13, 95% CI [1.10, 1.17]), even if stress levels were held constant across groups, and 37.3% of the income-related mental health disparities potentially mitigated by ensuring food security. Housing insecurity exhibited a CDE of 1.12 (95% CI [1.08, 1.16]), with 42.6% of the disparity eliminated, emphasizing the importance of stable housing in addressing poor mental health in the region. Mental health care access, with a CDE of 1.14 (95% CI [1.11, 1.17]) and a PE effect of 33.4%, highlights the critical role of service availability in reducing poverty-driven mental health burdens. Social support, a significant mediator, was associated with a 15% increased risk of poor mental health in the lowest compared to the highest income group (RR = 1.15, 95% CI [1.11, 1.18]) and, if eliminated, would reduce the poverty–mental health disparity by 32.1%. Finally, discrimination was also identified as a significant mediator, with a CDE of 1.13 (RR = 1.13, 95% CI [1.09, 1.17]) and a PE of 27.1%, highlighting the need to address structural barriers.

Sensitivity analyses showed similar results across genders, with slightly higher PE for women regarding mental health care and discrimination. Defining poor mental health as 14+ days of poor mental health in a month attenuated CDEs but retained similar PEs. Controlling for health status also attenuated CDEs. For low-income groups, most results aligned with the lowest income group, except mental health care access, which eliminated 43% of disparities in the low-income group versus 34% in the lowest income group. Full results are in Supplemental Tables 1–4.

Discussion

In this study, we found that poverty independently contributes to poor mental health in Southern Appalachia communities, with several key mediators amplifying this relationship. Our results demonstrated the mental health disparities associated with poverty could be reduced through

Table 1

Characteristics of Survey Participants by Poor Mental Health Status, Based on the Combined 2021 and 2024 Community Health Needs Assessment Survey Samples

Sample characteristic	Total weighted % (*n*)[a]	Without poor mental health weighted % (*n*)	With poor mental health weighted % (*n*)
Age (years)			
18–34 years	20.02 (1,383)	16.91 (916)	32.01 (451)
35–54 years	32.47 (3,324)	31.08 (2,484)	39.06 (803)
55–65 years	20.42 (2,391)	21.56 (1,974)	16.39 (375)
65+ years	27.09 (4,052)	30.43 (3,554)	12.52 (354)
Sex			
Male	48.12 (3,601)	51.42 (3,088)	33.84 (415)
Female	51.88 (7,558)	48.58 (5,857)	66.16 (1,559)
Race/ethnicity			
Non-Hispanic White	87.78 (9,530)	87.85 (7,361)	87.59 (1,708)
Non-Hispanic Black/African American	4.32 (478)	4.56 (392)	3.64 (78)
Hispanic	4.50 (562)	4.42 (463)	4.46 (88)
American Indian/Alaska Native	1.62 (287)	1.53 (220)	1.94 (61)
Other	1.78 (200)	1.62 (150)	2.37 (41)
Insurance status			
Insured	87.40 (9,988)	88.50 (8,076)	82.99 (1,692)
Uninsured	12.60 (1,171)	11.50 (868)	16.97 (288)
Educational attainment			
Some high school	4.76 (556)	4.24 (421)	5.35 (94)
High school degree	17.44 (1,927)	17.13 (1,484)	18.66 (389)
Some college	32.17 (3,616)	30.30 (2,783)	37.51 (749)
College degree	25.52 (2,827)	26.40 (2,331)	24.02 (467)
Postgraduate degree	20.11 (2,245)	21.93 (1,935)	14.46 (284)
Number of children in the household			
No children	70.27 (8,254)	71.23 (6,733)	66.27 (1,320)
1–2 children	23.81 (2,378)	22.74 (1,786)	28.52 (563)
3 + children	5.92 (535)	6.03 (427)	5.21 (101)
Urbanity			
Urban	61.02 (4,755)	60.59 (3,756)	62.51 (906)
Suburban	19.63 (2,268)	19.52 (1,790)	20.14 (427)
Rural	19.35 (4,168)	19.89 (3,418)	17.33 (652)

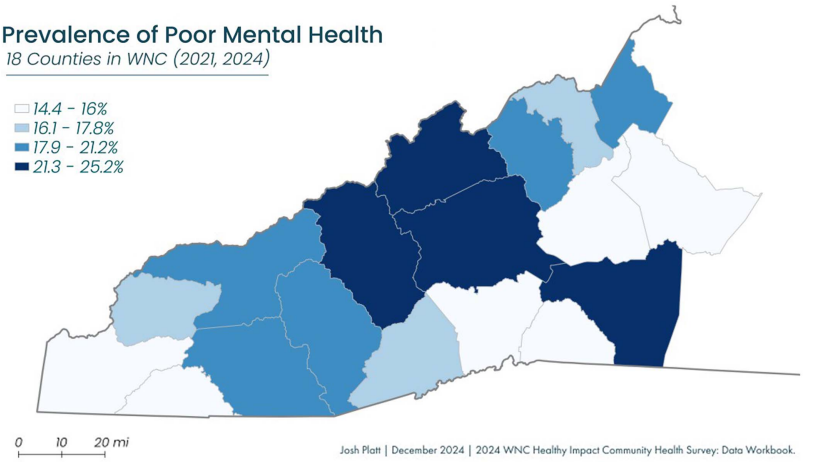
[a] The number of participants (*n*) in each was calculated based on the unweighted sample ($n = x$).

community-based and local policy interventions that directly target the identified mediating pathways, including strengthening food and housing stability programs, expanding access to mental health care through integrated and telehealth models, enhancing community-based social support networks, and implementing trauma-informed, culturally responsive practices to reduce stress and discriminatory experiences.

Our findings highlight the potential to harness community resilience by addressing stress, which emerged as an important mediator. Poverty's multidimensional nature, encompassing job instability, income volatility, and social isolation, exacerbates mental health issues through chronic stress and uncertainty. While mental health services remain underfunded compared to physical health care, addressing mental disorders can significantly improve employment and economic outcomes (Ridley et al., 2020). Evidence suggests that multifaceted antipoverty programs yield greater long-term benefits when mental health services are integrated into existing economic and social support systems, such as embedding mental health screening and referral within workforce, housing, and nutrition assistance programs and coordinating services across health and human service agencies, thereby reducing stress-related barriers to participation and helping to disrupt the cycle of poverty and poor mental health in rural communities (Ridley et al., 2020).

Food insecurity emerged as a significant mediator linking poverty and poor mental health. Research indicates that food insecurity is associated with cognitive impairments and mood disorders,

Figure 2
Prevalence Map of Poor Mental Health



Note. The figure shows the map of the prevalence of poor mental health defined as seven or more days over the past month, based on data from the WNC Community Health Needs Assessment 2021 and 2024 county surveys. WNC = Western North Carolina. See the online article for the color version of this figure.

with severity correlating with increased mental health risks, including suicidal ideation, regardless of socioeconomic status (Cai & Bidulescu, 2023). It is often accompanied by higher stress levels and social isolation and particularly affects women. Two perspectives explain this connection: one from nutrition science, suggesting that micronutrient deficiencies lead to biochemical imbalances affecting brain function and stress hormones, and another from social science, emphasizing the psychosocial impacts of food insecurity on social relationships and identity by way of cultural norms (Weaver et al., 2021). As a modifiable factor, targeting food insecurity offers a strategic opportunity for poverty alleviation and mental health improvement, particularly benefiting vulnerable groups such as low-income women and single mothers and their children, making it a critical intervention point for enhancing mental health outcomes within financially constrained populations (Coleman-Jensen et al., 2017).

Housing insecurity, defined as the "loss of, threat to, or uncertainty of a safe, stable, and affordable home" (DeLuca & Rosen, 2022, p. 344), prevalent among the rural poor, is a significant economic hardship that often accompanies food insecurity and exacerbates mental health issues (Coleman-Jensen & Steffen, 2017). Housing is a strong determinant of health (Antin et al., 2024). In rural areas, housing insecurity operates as a cascading risk factor, disrupting access to health care, destabilizing employment, increasing the risk of job loss, worsening physical and mental health, and elevating the risk of substance misuse, including alcohol and drug dependence (Braveman, 2023). This insecurity stems from low incomes and a limited supply of affordable housing options, much of which are aging or often poorly maintained due to long-standing underinvestment in rural communities. Most U.S. households allocate the largest portion of their budget to shelter, leaving financially strained households "shelter poor," with insufficient funds for other essential needs and little ability to buffer against financial crises (Coleman-Jensen & Steffen, 2017). Unlike in urban areas, rural housing insecurity often remains hidden, with individuals doubling up with others, living in vehicles, or camping, which exacerbates their social marginalization due to stigma and hypervisibility in communities lacking adequate social services (Coleman-Jensen & Steffen, 2017). Addressing the unique challenges of rural housing insecurity through tailored, place-based solutions is critical for improving the mental health and well-being of rural residents.

Similar to our results, discrimination has been identified as an explicit mediator between poverty and adverse health outcomes, explaining part of the association between socioeconomic disadvantage and self-rated health over time (Fuller-Rowell

Table 2
Decomposition of Total, Direct, and Indirect Effects by Mediator

Effect component	RR[a] [95% CI]	*p*	Percent mediated (%) [95% CI]	Percent eliminated (%) [95% CI]	Percent due to interaction (%) [95% CI]
Mediator: Stress					
Total effect	1.23 [1.19, 1.27]	<.0001	63.59 [52.73, 74.44]	48.58 [40.20, 56.96]	15.01 [11.08, 18.93]
CDE	1.11 [1.08, 1.14]	<.0001			
NDE	1.08 [1.05, 1.11]	<.0001			
NIE	1.14 [1.11, 1.17]	<.0001			
Mediator: Food security					
Total effect	1.22 [1.01, 1.19]	<.0001	51.54 [41.91, 61.17]	37.30 [27.12, 47.47]	14.25 [5.75, 22.74]
CDE	1.13 [1.10, 1.17]	<.0001			
NDE	1.10 [1.07, 1.14]	<.0001			
NIE	1.11 [1.09, 1.13]	<.0001			
Mediator: Housing security					
Total effect	1.22 [1.18, 1.26]	<.0001	59.32 [46.90, 71.75]	42.64 [29.14, 56.14]	16.68 [4.11, 29.25]
CDE	1.12 [1.08, 1.16]	<.0001			
NDE	1.08 [1.05, 1.12]	<.0001			
NIE	1.12 [1.11, 1.14]	<.0001			
Mediator: Mental health care access					
Total effect	1.21 [1.18, 1.25]	<.0001	37.63 [30.62, 44.63]	33.37 [27.22, 39.53]	4.25 [2.06, 6.44]
CDE	1.14 [1.11, 1.17]	<.0001			
NDE	1.13 [1.10, 1.16]	<.0001			
NIE	1.08 [1.06, 1.09]	<.0001			
Mediator: Social support					
Total effect	1.22 [1.19, 1.26]	<.0001	41.21 [33.63, 48.79]	32.12 [25.64, 38.60]	9.09 [4.88, 13.30]
CDE	1.15 [1.11, 1.18]	<.0001			
NDE	1.13 [1.09, 1.16]	<.0001			
NIE	1.09 [1.07, 1.10]	<.0001			
Mediator: Discrimination					
Total effect	1.18 [1.14, 1.22]	<.0001	31.61 [21.90, 41.32]	27.06 [18.81, 35.30]	4.55 [0.60, 8.50]
CDE	1.13 [1.09, 1.17]	<.0001			
NDE	1.12 [1.08, 1.16]	<.0001			
NIE	1.05 [1.04, 1.07]	<.0001			

Note. The table shows the mediation roles of access to mental health support, discrimination, food insecurity, housing insecurity, social support, and stress between poverty and poor mental health: four-way decomposition mediation analysis, 2021 and 2024 Community Health Needs Assessment survey. Poverty exposure was characterized as lowest income versus highest income. RR = risk ratio; CI = confidence interval; CDE = controlled direct effect; NDE = natural direct effect; NIE = natural indirect effect.

[a] All estimates were adjusted for the following covariates: age, sex, race/ethnicity, number of children currently in the household, educational attainment, insurance coverage, and urbanity.

et al., 2012). The psychological impact of discriminatory experiences contributes to the "weathering" effect, creating a cumulative health burden that exacerbates both mental and physical health challenges for underrepresented groups (Forde et al., 2019). Discrimination is a significant chronic stressor linked to poor mental health outcomes, including anxiety, depression, and other stress-related disorders (Vargas et al., 2020). These inequities are further compounded in geographically isolated areas, where institutional barriers and limited resources leave individuals with fewer opportunities to seek help, access treatment, or advocate for equitable care (Mack et al., 2022). In rural communities, such as those across Southern Appalachia, such challenges are magnified by systemic biases, limited health care access, and inadequate support systems, leaving financially constrained populations disproportionately affected by discriminatory experiences (Mack et al., 2022). However, efforts to reduce discrimination and improve cultural competency within health care and other social service systems, alongside initiatives that aim to empower underrepresented groups, offer a critical pathway for lowering mental health disparities by removing barriers to care and creating inclusive environments that support resilience in Southern rural Appalachia.

Consistent with prior research on the role of perceived social support in moderating the impact of poverty on mental health (McCulloch, 1995), our findings emphasize its importance as a key mediator. Social support has long been recognized as an effective buffer against the negative mental health consequences of economic hardship, particularly in the context of chronic stress and adverse life events. Social support has also been linked to better health and well-being in a variety of rural populations, like children and parents and perinatal populations residing in the Southern United States (Mollard et al., 2016; Robinson et al., 2017). In rural communities, individuals experiencing mental illness challenges often face compounded barriers, such as limited access to health care, a scarcity of community-based resources, and cultural norms that discourage help-seeking. Enhancing social support represents a powerful, locally relevant strategy for addressing these barriers by reducing isolation, enhancing coping capacity, and facilitating pathways to care. Community-driven approaches, such as community health workers or peer support group networks, can build on existing social cohesion and local knowledge to reinforce social connections, normalize mental health help-seeking, and build resilience in the face of intersecting economic and mental health stressors (N. E. Cheesmond et al., 2019; N. Cheesmond et al., 2020).

Building Resilience Through Community-Driven Solutions

Community-based programs can build resilience by strengthening support networks that reduce stress and by providing concrete resources such as food assistance (e.g., food pantries), housing stability and utilities support, and benefits navigation through local social service agencies or federally qualified health centers. These programs can also foster inclusive, stigma-reducing environments by offering mental health screening, referral, and counseling through community health centers, faith-based organizations, and peer support models, increasing access to care in rural settings. Local policymaking should prioritize policies that reduce the structural inequities contributing to these mediators, such as affordable housing initiatives, nutrition programs, and anti-discrimination laws, while ensuring accessible and culturally tailored mental health services. Clinical interventions should adopt a more holistic model, recognizing the interconnectedness of these social factors, and offer tailored care that addresses not only the clinical symptoms but also the social determinants of health. By combining community-level interventions with policy reforms and clinical care, we can create a supportive ecosystem that addresses the root causes of poverty-related mental health disparities, ultimately ensuring the sustained well-being of rural communities.

Strengths and Limitations

One key strength of this study was the use of a regionally representative sample from the Community Health Needs Assessment. To our knowledge, this is the first study to investigate the mediating role of food insecurity, stress, housing insecurity, access to mental health services, social support, and discrimination in a predominantly rural sample of U.S. adults. The use of a four-way decomposition mediation analysis provided a more nuanced understanding of how poverty, mental health, and social determinants of health are interconnected. The causal mediation analysis, grounded in a counterfactual approach, allowed us to test for sequential ignorability, while also decomposing the total effect, providing a clearer picture of the indirect effects of mediators (Imai et al., 2010). Furthermore, our methodological approach enhances the precision of identifying causal pathways. The findings offer valuable insights for policymakers, particularly regarding the allocation of food benefits and health resources, which could inform more targeted interventions. Additionally, these results have implications for clinical practice, potentially guiding the prevention and improvement of mental health in at-risk populations, thus contributing to both public health and clinical advancements.

A limitation of this study is the reliance on self-reported data for mental health, income, and key mediators, which may introduce bias. While the adjustment of sociodemographic factors may have addressed possible confounding, the mediation effect should be interpreted with caution in the context of adjustment for covariates. Additionally, while our analysis used two cross-sectional waves of survey data, the potential for reverse causation remains a concern (Lemmer & Gollwitzer, 2017). Finally, although we examined several mediators, there are other possible pathways explaining the

relationship between poverty and poor mental health that were not examined in this study.

Conclusions

In summary, this study demonstrates that poverty shapes mental health in rural Southern Appalachia through modifiable social determinants, including food and housing security, access to mental health care, stress, discrimination, and social support. Importantly, these pathways also represent community assets that, when reinforced, can mitigate the mental health consequences of economic hardship. By building on existing community assets, such as the close-knit social networks and innovative locally driven solutions, future policies and programs can move beyond deficit-based approaches to reduce mental health disparities, strengthen community resilience, and advance equity in rural Southern Appalachian communities.

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