**STATE MINIMUM WAGE AND MENTAL HEALTH AMONG CHILDREN AND ADOLESCENTS**

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**INTRODUCTION**

The mental health of children and adolescents in the United States has become a growing concern. Rates of mood and anxiety disorders have been rising, with reports indicating that between 2016 and 2019, 3% of children aged 3 to 17 were diagnosed with depression and 9% experienced anxiety. The COVID-19 pandemic has only intensified these issues. Poor mental health in childhood can have far-reaching consequences, affecting not only immediate well-being and school performance but also future outcomes such as educational achievement, employment prospects, and long-term health conditions.

Economic insecurity is a key contributor to poor mental health, particularly for children growing up in poverty. Financial stress can strain family dynamics, limit access to health care, and exacerbate emotional and behavioral difficulties. Policies aimed at alleviating economic hardship – such as raising the minimum wage – may have unintended yet important benefits for children’s mental well-being. Research has already linked higher minimum wages to improved physical health outcomes in children, including reductions in infant mortality, increases in birth weights, better school attendance, and lower rates of teen pregnancy. While studies have explored how minimum wage policies affect adult mental health, far less is known about their impact on children’s psychological well-being.

Children’s mental health may be particularly responsive to shifts in household income. Economic strain is linked to increased emotional and behavioral issues, while financial relief could allow caregivers to better support their children, seek appropriate mental health care, and provide access to better living conditions and education. Adolescents who work may also experience the direct effects of minimum wage changes through shifts in employment opportunities and earnings.

This study investigates the relationship between state minimum wage policies and children’s mental health using a national survey that includes almost 240,000 children and adolescents in the U.S. from 2016 to 2022. By applying spatial modeling approaches, I assess 5 mental-health related outcomes including clinical symptoms, diagnoses, and access to mental health care. Findings from this study can help contribute to the growing discussion on how economic policies can shape public health, particularly for vulnerable populations.

**METHODS**

**STUDY POPULATION**

This study was based on publicly available, deidentified data from the 2016-2022 waves of the National Survey of Children’s Health (NSCH). The NSCH, an annual probability-based survey, assesses children’s physical and emotional health through responses from parents or guardians of a randomly selected child in a sampled household.

Following standard surveillance study protocols that assess mood disorders beginning at age 3 years, children younger than 3 were excluded from the analysis. Participants missing age data or lacking responses for all outcomes of interest were also excluded. For specific outcome-based analysis, pairwise deletion was applied, meaning participants missing data for a particular outcome were excluded only from that analysis. The NSCH dataset contained complete information on age and at least one outcome, with pairwise missingness ranging from 0.3% to 0.7% (unweighted).

**OUTCOMES**

The primary exposure variable in this study was the state minimum wage, measured in U.S. dollars. Wage data was obtained from the U.S Department of Labor. To assess mental health outcomes, 5 binary indicators that collectively reflected various aspects of clinical, behavioral, and social well-being in children and adolescents. All outcomes were caregiver-reported. I examined whether a child had been diagnosed with one of four mental health conditions that were actively affecting them at the time of the survey: (1) depression, (2) anxiety, (3) attention deficit disorder and/or attention-deficit/hyperactivity disorder (ADD/ADHD), and (4) behavior problems. These conditions have been strongly associated with both poverty and financial stress. Beyond diagnosed mental health conditions, I explored whether the child did not receive needed mental health care in the past year, which is also linked to emotional distress and socioeconomic hardship and may indicate potential barriers to accessing mental health services.

**STATISTICAL METHODS**

I employed a Bayesian spatial modeling framework using integrated nested Laplace approximation (INLA) to examine the relationship between state minimum wage policies and mental health outcome among children and adolescents, while accounting for spatial dependence across states. Specifically, I addressed two key research questions: (1) does the state minimum wage influence mental health outcome among children and adolescents after accounting for spatial variation? and (2) do associations between state minimum wage and mental health outcomes differ across age and gender subgroups?

To account for spatial correlation, I used a conditional autoregressive (CAR) model with the Besag framework, which captures unobserved state-level influences on mental health outcomes while adjusting for observed covariates. Survey sampling weights were applied to ensure that estimates were representative of the national and state-level populations of children and adolescents, adjusting for the complex sampling structure and year-to-year variations in survey design. Weighted state-level prevalence estimates of mental health outcomes were mapped to visualize geographic patterns.

To estimate the association between state minimum wage and mental health while controlling for spatial autocorrelation, I specified a Bayesian hierarchical model with a Besag CAR structure:

where is the binary mental health outcome for state , quantifies the effect of state minimum wage, and account for age and gender subgroup effects, estimates the association with time (in years), estimates the effect of household income relative to the federal poverty line, represents the spatially structured random effect, and is the unstructured state-level error term. The CAR prior was informed by an adjacency matrix that defined neighboring states, ensuring that states sharing a border had correlated random effects.

To evaluate whether the association between state minimum wage and mental health outcomes varied across age and gender, I incorporated interaction terms into the model:

where captures how the effect of minimum wage varies across age groups, captures how the effect of minimum wage differs by gender, and all other terms remain as described above. Subgroup analyses were conducted with interaction models which tested for statistically significant interactions between minimum wage and age group as well as minimum wage and gender to formally assess heterogeneity in associations. Statistical significance was determined using posterior probability intervals, with a meaningful effect modification inferred if the posterior probability of an interaction term being nonzero exceeded 95%.

To visualize both observed and modeled spatial patterns of mental health outcomes, I generated weighted prevalence maps displaying state-level prevalence estimates based on survey data and modeled prevalence maps which mapped predicted mental health outcome rates from the INLA CAR model to highlight spatial trends adjusted for covariates. Comparing these maps provided insights into the degree to which state minimum wage policies aligned with geographic patterns of mental health outcomes.

The posterior distributions of (minimum wage effect), (minimum wage age group), and (minimum wage gender) provided a probabilistic assessment of whether the relationship between state minimum wage and mental health outcomes was significant overall (assessed via ), differential across age groups (assessed via ), and different by gender (assessed via ). Associations were considered meaningful if the posterior probability of a nonzero effect exceeded 95%. By incorporating spatial dependencies this study provides an evaluation of how economic policies may shape mental health outcomes among children and adolescents, both overall and across demographic subgroups.

**RESULTS**

**PREVALENCE TRENDS**

Across all models, mental health outcomes exhibited an increasing trend over time, with the highest prevalence observed in 2021-2022. Notably, behavioral issues and unmet mental health needs demonstrated distinct spikes in 2020, suggesting pandemic-related disruptions may have influenced mental health service utilization and child well-being. For age and sex differences, ADHD, behavioral issues, and unmet mental health needs were more prevalent in males, whereas depression and anxiety were more common in females. Younger children (ages 3-12) consistently exhibited lower prevalence of all examined conditions compared to adolescents (ages 13-17).

**DEPRESSION AND ANXIETY**

The overall effect of state minimum wage on depression and anxiety prevalence was negligible, with no statistically significant associations detected in the primary models. However, interaction analyses suggested that higher minimum wages were associated with a small but significant reduction in depression prevalence among younger children (β = -0.001, 95% CI: -0.002, -0.001) and a slight increase in anxiety prevalence among females (β = 0.003, 95% CI: 0.002, 0.004). These findings suggest that economic policies may have heterogeneous effects across subpopulations, potentially driven by differences in economic dependence on caregivers or access to mental health services.

**ADHD AND BEHAVIORAL ISSUES**

For ADHD, higher state minimum wages were associated with a small but statistically significant reduction in prevalence (β = -0.004, 95% CI: -0.006, -0.003), though interaction effects indicated that minimum wage increases were linked to slightly higher ADHD prevalence in younger children (β = 0.002, 95% CI: 0.001, 0.003) and females (β = 0.003, 95% CI: 0.001, 0.004). These subgroup effects may reflect improved healthcare access leading to increased diagnoses rather than true increases in ADHD incidence.

For behavioral issues, minimum wage had no significant main effect (β = -0.001, 95% CI: -0.003, 0.000). However, subgroup analyses revealed a small decrease in prevalence among younger children (β = -0.001, 95% CI: -0.002, 0.000), mirroring patterns observed for depression. In contrast, females in states with higher minimum wages exhibited slightly increased prevalence of behavioral issues (β = 0.003, 95% CI: 0.002, 0.004).

**UNMET MENTAL HEALTH NEEDS**

In contrast to the other outcomes, unmet mental health needs were positively associated with higher minimum wages, though the magnitude of this effect was small (β = 0.001, 95% CI: 0.000, 0.002). No significant differences were observed between males and females, and the small interaction effect for younger children (β = -0.001, 95% CI: -0.001, 0.000) suggested that higher minimum wages might slightly improve access to care among this age group. The overall increase in unmet mental health needs over time, particularly in 2021-2022, suggests that broader systemic barriers, such as shortages in mental health providers or increased demand, may have contributed to these trends.

**SPATIAL VARIATION IN MENTAL HEALTH OUTCOMES**

All models included a Besag ICAR random effect to account for spatial dependency at the state level, but the magnitude of spatial variation differed across outcomes. Depression, anxiety, and behavioral issues exhibited moderate spatial variation, suggesting that state-level policies and contextual factors contributed modestly to prevalence differences across geographic regions. ADHD displayed the largest degree of spatial heterogeneity, indicating that state-specific diagnostic practices, healthcare accessibility, or educational policies may shape ADHD prevalence more than other conditions. Unmet mental health needs demonstrated minimal geographic variation, implying that access to mental healthcare may be driven by national policies and healthcare infrastructure rather than state-level economic factors.

Despite these variations, the precision estimates for the spatial random effects suggested that individual-level and temporal factors played a larger role in shaping mental health outcomes than geographic clustering alone.

**DISCUSSION**

This study investigated the relationship between state minimum wage policies and several key mental health outcomes in children and adolescents, including depression, anxiety, ADHD, behavioral issues, and unmet mental health needs. Using Bayesian spatial models incorporating Besag ICAR priors to account for geographic clustering, I assessed both direct associations between minimum wages and mental health outcomes, as well as potential effect modification by age and sex. While the overall effects of minimum wage on most mental health outcomes were small or non-significant, several key subgroup-specific patterns emerged, shedding light on the nuanced ways in which economic policies may interact with child and adolescent mental health.

The primary models without interaction terms revealed no significant overall associations between state minimum wages and the prevalence of depression, anxiety, behavioral issues, or unmet mental health needs. However, for ADHD, I found a small but significant negative association, suggesting that higher minimum wages were linked to a slight decrease in ADHD prevalence. These results align with prior research indicating that economic stability can alleviate household stressors that contribute to childhood behavioral and emotional disorders but suggest that minimum wage policies alone may not be a strong determinant of overall child mental health outcomes.

When incorporating interaction terms, I observed notable subgroup effects, particularly for younger children (ages 3-12) and females. Younger children (ages 3-12) in states with higher minimum wages exhibited slightly lower prevalence of depression and behavioral issues, supporting the idea that economic security may have a protective effect on mental health during early childhood. However, younger children also showed slightly higher prevalence of ADHD in higher-wage states, which may reflect increased access to healthcare services and greater likelihood of receiving an ADHD diagnosis rather than a true increase in ADHD symptoms. Females in higher-wage states exhibited slightly higher prevalence of anxiety, ADHD, and behavioral issues, raising questions about how minimum wage policies might interact with gendered stressors, employment dynamics, or healthcare-seeking behaviors.

Notably, unmet mental health needs slightly increased in states with higher minimum wages, a pattern that persisted across all models. This finding suggests that increasing wages alone does not necessarily improve access to mental health services and that broader systemic barriers—such as provider shortages, affordability of care, and insurance coverage—may continue to limit access despite economic improvements at the household level.

Across all models, mental health outcomes exhibited an increasing trend over time, with the highest prevalence of depression, anxiety, and behavioral issues occurring in 2021-2022. These patterns align with prior reports indicating that the COVID-19 pandemic exacerbated mental health challenges among children and adolescents, likely due to school closures, social isolation, family financial strain, and disruptions in mental health service availability. The particularly sharp increase in behavioral issues in 2020 suggests that external stressors, rather than individual-level risk factors alone, played a critical role in shaping children’s mental health trajectories.

The Besag ICAR random effect models revealed varying degrees of spatial heterogeneity across mental health outcomes, underscoring the importance of state-level policies and contextual factors in shaping children’s well-being. Depression and anxiety exhibited moderate spatial variation, suggesting that state policies and socioeconomic conditions contributed modestly to differences across geographic regions. ADHD showed the highest degree of spatial heterogeneity, indicating that state-specific healthcare access, school policies, and diagnostic trends likely influence ADHD prevalence more than other conditions. Unmet mental health needs displayed minimal geographic variation, implying that barriers to accessing mental health care are relatively uniform across the country and more likely driven by national healthcare policies than state-level wage differences. The relatively modest spatial variation observed in most models suggests that while economic policies such as minimum wage adjustments may play a role in shaping child mental health outcomes, they are likely secondary to broader systemic factors, such as state Medicaid expansion, mental health workforce capacity, and school-based mental health programs.

These findings contribute to the growing literature on the relationship between economic policies and child mental health, complementing prior studies that have identified positive effects of higher minimum wages on adult mental health but limited evidence for direct effects on children. Studies have shown that minimum wage increases can reduce financial strain and improve physical health outcomes, such as birth weights and infant mortality, yet their impact on childhood mental health remains less clear. The age-specific effects observed in this study align with previous research indicating that younger children’s mental health is more sensitive to economic fluctuations, likely due to their greater dependence on parental financial stability. Similarly, the gender differences identified mirror studies suggesting that economic stress and employment changes may disproportionately affect females, potentially contributing to increased anxiety and behavioral issues in adolescent girls.

This study has several limitations that should be considered when interpreting the findings. Minimum wage policies may not capture all relevant economic conditions. While I controlled for household poverty levels, additional economic factors—such as cost of living, inflation, and state unemployment rates—may also influence child mental health. Future studies should incorporate broader economic indicators to better understand these relationships. Additionally, there are potential limitations in mental health outcome reporting. The prevalence of mental health conditions in children and adolescents is largely based on caregiver or self-report, which may vary across states due to differences in mental health awareness, access to services, and cultural attitudes toward mental health care. This study was observational in nature and does not establish causality. While these models controlled for spatial dependence and temporal trends, unmeasured confounders—such as state-level differences in healthcare policies and mental health infrastructure—may still influence these findings. Lastly, the interaction effects require further exploration. While I identified age- and sex-specific differences in mental health responses to minimum wage policies, the underlying mechanisms remain unclear. Future research should explore whether these patterns reflect true psychological effects, increased diagnosis rates, or differences in healthcare-seeking behavior.

The findings from this study suggest that state minimum wage policies alone may not be sufficient to drive meaningful changes in child and adolescent mental health outcomes. While higher wages may offer some protective effects for younger children, they appear less effective in addressing mental health disparities in older children and adolescents. Given that unmet mental health needs increased despite higher wages, policy efforts should focus not only on economic stability but also on strengthening mental health service infrastructure, particularly for underserved populations and rural areas. Expanding school-based mental health programs, increasing Medicaid reimbursement rates for mental health services, and investing in mental health workforce development could be key strategies to ensure that economic improvements translate into better mental health outcomes for children and adolescents. Future research should continue to explore the intersections of economic policies, healthcare access, and social determinants of health to better inform multi-level interventions that address both economic and healthcare barriers in improving youth mental health.

**FIGURES AND TABLES**

Table 1A. Weighted Prevalence of Mental Health Outcomes by Year

A screenshot of a computer

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Table 1B and 1C. Weighted Prevalence of Mental Health Outcomes by Sex and Age Group

A screenshot of a phone

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Tables 2A and 2B. Regression Results from Depression Models

A screenshot of a data sheet

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Tables 3A and 3B. Regression Results from Anxiety Models

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Tables 4A and 4B. Regression Results from ADD/ADHD Models

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Tables 5A and 5B. Regression Results from Behavioral Problems Models

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Tables 6A and 6B. Regression Results from Unmet Mental Needs Models

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Figure 1. Interaction Effects

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Figure 2. Average Minimum Wage by State

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Figure 3A. Weighted Prevalence of Depression by State

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Figure 3B. Weighted Prevalence of Anxiety by State

A map of the united states

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Figure 3C. Weighted Prevalence of ADD/ADHD by State

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Figure 3D. Weighted Prevalence of Behavioral Problems by State

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