**The Minimum Wage and Children’s Mental Health**

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**Structured abstract**

**Introduction**

Children and adolescents in the U.S. are facing a mental health crisis.1–6 Mood and anxiety disorders are on the rise in this population, with 3% of children aged 3–17 having depression and 9% having anxiety in 2016–2019.7 The COVID-19 pandemic has only accelerated the crisis.8 Poor mental health has pervasive impacts on a child’s quality of life and academic performance.9 It even has consequences lasting into adulthood, as adolescent depression has been associated with lower long-run educational attainment, higher rates of unemployment, and earlier parenthood.10

Structural changes, such as raising the minimum wage, have the potential to improve children’s mental health.11 Children living in poverty are especially burdened by poor mental health, with higher rates of depression, anxiety, and behavioral disorders than children in higher-income households.12 Raising the minimum wage has been associated with improvements in children’s physical health, including birth weights,13 infant mortality,13,14 school absenteeism,15 and indexes of overall health,15 with heterogeneous results by demographic group.16,17 However, no studies have examined the effect of raising the minimum wage on children’s mental health.

Children’s mental health may be especially responsive to changes in a family’s income. For example, children’s emotional and behavioral problems tend to worsen with household economic stress.12,18 And when families’ incomes rise, they disproportionately dedicate those resources to their children.19 Consequently, raising the minimum wage could meaningfully improve their mental health, whether by reducing household financial stress,18,20 meeting a child’s need for mental health care,12,21 or granting access to other resources that could improve their mental health, such as higher-quality housing, time for exercise and leisure, or better education.22,23

In this study, we use two nationally representative samples of over 1.4 million children and adolescents, aged 3 to 18, in the U.S. from 2001 to 2020 to estimate the effect of raising the minimum wage on children’s mental health. We examine several outcomes, including diagnoses, symptoms, health care utilization, and impacts on school and social life. This study has important implications for the design of economic policy to improve the mental health of children, as well as the use of structural interventions to benefit vulnerable populations more generally.

**Materials and Methods**

***Study Populations***

We use two nationally representative surveys of children in the U.S.: the National Survey of Children’s Health (NSCH) and the Youth Risk Behavior Surveillance System (YRBSS). Each captures a different time, population, and outcomes of interest. Together, they allow us to broadly characterize the relationship between the minimum wage and children’s mental health.

We used the 2016 to 2020 waves of the NSCH, a yearly, national study of children’s physical and emotional well-being in the U.S. It samples households known to have a child based on Census data and those projected to have one based on demographic characteristics. Then, parents and guardians report on one of their children. All analyses using the NSCH are weighted to be representative of all children in all state-years. Consistent with surveillance studies that estimate the prevalence of mood disorders starting at age 3,7 we include all children aged 3–17 whose parent or guardian provided information on at least one of our outcomes, for a sample of 141,427.

Next, we used the 2001 to 2019 waves of the state-level YRBSS, a set of biennial, state-level surveys of mental health and risk behaviors in adolescents. As a school-based study, it samples classrooms within randomly selected schools. Then, adolescents directly respond to the surveys. All analyses using the YRBSS are weighted to be representative of all students in grades 9–12 in each state-year, although not all states participate in all years. We include all adolescents who provided information on at least one of our outcomes, for a sample of 1,246,623. The demographic characteristics of respondents to each survey are provided in **Tables 1** and **2**.

***Exposure and Outcome Measures***

Our primary exposure is a state’s effective minimum wage per year in U.S. dollars. Based on wage data from the Bureau of Labor Statistics, we use the higher of a state’s minimum wage or the federal minimum wage. Descriptive statistics for the wages are provided in **Figure 1**. As outcomes, we examine 15 measures of mental health for children and adolescents, spanning self-reported diagnoses, symptoms, health care utilization, and impacts on school and social life. Together, they capture the clinical, behavioral, and social facets of a child’s mental well-being.

For the NSCH, we evaluate whether a child (1) has depression as diagnosed by a doctor or other health care provider; (2) has diagnosed anxiety; (3) has diagnosed ADD or ADHD; (4) has behavioral problems as identified by a health care provider or educator; (5) has had chronic difficulty digesting food (e.g. stomach or intestinal problems, constipation, or diarrhea) in the past calendar year, a common manifestation of anxiety in children; (6) has not received necessary health care of any kind in the past year; (7) has not received necessary mental health services in the past year; (8) has missed 7 or more days of school in the past year, which may result if a child has debilitating mental health problems; and (9) has participated in any formal or informal paid employment in the past year. All outcomes in the NSCH are reported by parents or guardians.

For the YRBSS, we evaluate whether an adolescent (1) has felt incapacitating sadness or hopelessness for two weeks or longer in the past calendar year, which is a diagnostic criterion for depression; (2) has considered suicide in the past year; (3) has attempted suicide in the past year; (4) has used alcohol in the past month; (5) has used marijuana in the past month; and (6) has been in a physical fight in the past year. All outcomes in the YRBSS are directly reported by adolescents. The exact wording and coding of all survey questions are provided in the appendix.

***Statistical Analyses***

We test the impact of rising state minimum wages on children’s mental health using two approaches: two-way fixed effects (TWFE) and difference-in-differences models. TWFE models capture the descriptive association between a state’s minimum wage and children’s mental health, while the difference-in-differences estimate the causal effect of the former on the latter.

First, our TWFE models estimate the association between a $1 increase in the minimum wage and the percentage-point change in the prevalence of each outcome. They are akin to a difference-in-differences model when the treatment variable is continuous, and they allow us to use all states-years of available data. As such, they are the most generalizable approach to understanding how the minimum wage shapes children’s mental health. The TWFE models include state fixed effects to account for time-invariant statewide social and policy characteristics, as well as year fixed effects to account for time-variant national economic trends. The YRBSS models also include age-by-year fixed effects to account for generational differences over the two decades.

We also adjust for competing time-variant state policies that might affect low-income families: (1) the state’s Medicaid income eligibility limits for children aged 1–5 and (2) 6–18; (3) whether the state has an earned income tax credit (EITC); (4) the state’s EITC as a percent of the federal EITC, (5) whether the state’s EITC is refundable; and (6) the state’s maximum Temporary Assistance for Needy Families benefits for a family of three. On the respondent level, the NSCH models are adjusted for each child’s age, sex, race/ethnicity, family structure, the highest level of educational attainment by any adult in the household, and nativity. The YRBSS models have fewer available covariates and are adjusted for age, sex, race/ethnicity, and grade in school.

Of note, our main models include children of all income levels. This design is analogous to intention-to-treat, as a change in the minimum wage may affect any or all households in a state. Households earning near the minimum wage are mostly likely to see their take-home pay rise, but those earning above the minimum wage may experience spillover wage growth.24 Even so, we also estimate the associations for several vulnerable sub-populations of children who are more likely to benefit: in the NSCH, (1) households earning less than 200% of the federal poverty level; (2) households whose adults have a high school education or less; (3) Black and Hispanic/Latino children; (4) first- or second-generation children; and (5) adolescents (aged 13–17), many of whom work minimum wage jobs; and in the YRBSS, Black and Hispanic/Latino adolescents. To do so, we used interacted TWFE models, which interact the minimum wage variable with a dummy variable for the demographic group of interest. These analyses are all provided in the appendix.

We also examine the sensitivity of our results using models with (1) inflation-adjusted minimum wages (in 2020 dollars); (2) wages lagged by 1 year, in case gains in children’s mental health take time to manifest; (3) estimations by logistic regression, which provide the odds ratio for each outcome given a $1 increase in the minimum wage; and (4) the average minimum wage to which a child is exposed throughout their entire life. All are provided in the appendix.

Second, we use difference-in-differences models to estimate the causal effect of raising the minimum wage on adolescents’ mental health. For these models, we use the period from 2011–2019 and code 10 states that raised their minimum wage above the federal minimum as the treatment group, and 21 states that remained at the federal minimum as the control group. Then, we test how raising the minimum wage affects the YRBSS outcomes. Given the limited states and study period, the difference-in-differences are less generalizable than the TWFE models. However, since TWFE models can be biased when policies are implemented at different times, difference-in-differences allow us to identify an unbiased, causal effect.25–27 See appendix for full details.

All analyses use the NSCH or YRBSS weights to produce state-representative estimates, and all standard errors are clustered by state since the treatment is assigned at that level. Estimates using the survey’s nested clustered errors are provided in the appendix. We use the “lfe” package (v. 2.8) in R to estimate OLS models. This study did not require institutional review board approval as it used public, de-identified data. All replication materials are available at XXXXXXX.

**Results**

***National Survey of Children’s Health (NSCH)***

From 2016–2020, the NSCH collected parent- and guardian-reported surveys on 141,427 children aged 3–17 that we included in our analyses (**Table 1**). In cross-sectional analyses, a weighted 3% had depression, 8% had anxiety, 9% had ADD/ADHD, 7% had behavioral problems, and 8% had chronic digestive issues. In the past year, 4% had not received necessary medical care of any kind, while 1% had not received necessary mental health services. Meanwhile, 10% had missed 7 or more days of school, and 22% had a job or some form of employment.

There were deep inequities in children’s mental well-being by household income. For example, children living in poverty had a rate of depression that was 3 percentage points (pp) higher than that of children living above 400% FPL, after adjusting for age, sex, race/ethnicity, family structure, the highest education of any adult in the household, nativity, state, and year (see appendix). The inequities were similarly stark for all outcomes. Meanwhile, children in poverty had less access to economic opportunities, being less likely to have jobs than wealthier children.

Despite these economic inequities, there was little evidence that rising minimum wages from 2016­–2020 were associated with improvements in children’s mental health. During this period, the effective minimum wages ranged from $7.25 to $14 across states and Washington, D.C., with many states aggressively raising their wages (**Figure 1**). Even so, for all outcomes except absenteeism, TWFE models ruled out an improvement of 1 pp or less per $1 increase in the minimum wage. For absenteeism, we could rule out an improvement greater than 1.4 pp.

Similarly, there was minimal evidence of an association when we examined several vulnerable sub-populations, including children living in households under 200% FPL, households whose adults have a high school education or less; Black and Hispanic/Latino children; first- or second-generation children; and adolescents aged 13–17 (see appendix). Nor was there evidence of an association using several alternative specifications (also provided in the appendix).

***Youth Risk Behavior Surveillance System (YRBSS)***

Given that the NSCH is limited to parent- or guardian-reported outcomes over 5 years, we also analyzed the YRBSS, which has directly surveyed adolescents over decades. From 2001–2019, 1,246,623 adolescents were surveyed by the YRBSS and included in our analyses (**Table 2**). In cross-sectional analyses, a weighted 29% of adolescents reported being sad or hopeless for 2+ weeks, 16% considered suicide, 9% attempted suicide, and 27% had been in a physical fight in the past year. In the past month, 35% had used alcohol and 20% had used marijuana.

From 2001–2019, the effective minimum wage ranged from $5.15 to $14 across states and Washington, D.C., and the federal minimum wage rose from $5.15 to $7.25 between 2008 and 2010. Even so, there was little evidence that rising minimum wages during this period were associated with improvements in adolescents’ mental health (**Figure 3**). For all 6 outcomes, TWFE models ruled out an improvement of 1 pp or less per $1 increase in the minimum wage. Similarly, there was minimal evidence of improving mental health for Black and Hispanic/Latino children, specifically, nor in models that tested several alternative specifications (see appendix).

Lastly, we used difference-in-differences models to evaluate the causal effect of raising the minimum wage on adolescents’ mental health since the last raise in the federal minimum wage, i.e. 2011 to 2019. For all 6 outcomes, we saw little evidence of a causal improvement, even when we evaluated the effects up to 5 years later, and when treated children were exposed to a mean wage increase of $3.63 over control children. These models are described in the appendix.

**Discussion**

In this national study, we find little to no evidence that minimum wage increases over the past two decades have improved the mental health of children and adolescents in the U.S. We rule out meaningfully large effects using two national surveys, 15 outcomes capturing multiple facets of mental well-being, and both descriptive and causal approaches. We also fail to find evidence of benefit for several vulnerable populations, including lower-income and minoritized children.

Existing work on the minimum wage and mental health has shown mixed results but focused exclusively on adults.28 A longitudinal study on minimum wages in the United Kingdom from 1994–2001 found substantial improvements in the mental health of lower-wage workers, relative to higher-wage ones.29 However, a subsequent study suggested that any improvements were short-lived.30 In the U.S., a repeated cross-sectional study on the minimum wage from 1993–2014 identified improvements in the mental health of less-educated women but not men.31 Another study in the U.S. identified null effects for less-educated adults.32 Despite mixed evidence that rising minimum wages improve the mental health of vulnerable adults, our study suggests that similar benefits have not accrued to children and adolescents in the U.S. in recent decades.

Our findings also contrast with the mixed but generally positive studies on rising minimum wages and children’s physical health. Increases in the minimum wage have been associated with improvements in birth weights,13 infant mortality,13,14 school absenteeism,15 and indexes of children’s overall health.15 Mixed results have been identified for the self-reported general health of working teens, with some demographic groups seeing improvements,17 and null results with various outcomes for the children of immigrants.16 However, all these studies use TWFE models yet predate econometric advances that have identified biases in these models.25–27 As such, it may be necessary to update existing work on the minimum wage and children’s physical health using newer causal approaches. Our study includes one such approach to identify its null results.

One concern might be that countervailing forces produced our observed nulls. That is, rising wages might enable families to seek medical care for their children and get overdue diagnoses, resulting in higher reported rates of disorders even as their mental well-being improves. However, we find no evidence of improvements in any domain that we examine, including self-reported diagnoses, symptoms, health care utilization, or impacts on school and work. If there were truly countervailing forces, we should expect to see movement in at least one domain. Instead, it is more likely that raising the minimum wage — at least in the range of wages and contexts that we consider in our analyses — was insufficient to meaningfully improve children’s mental health.

Our study has several limitations. First, it is based on survey data, which is vulnerable to sampling, response, and weighting biases. That said, we use two surveys with different sampling schemes and both parent- or guardian- and adolescent-reported outcomes, all of which mitigate the risk of bias. Second, our study does not evaluate causal effects for all outcomes. It may be that raising the minimum wage causally improves those outcomes that we only test with TWFE models, which may be biased. Third, while many of our nulls are precisely estimated, we cannot rule out the possibility of more modest but still positive effects on children’s mental health. Lastly, we do not have geographic identifiers at a more local level than the state of respondents. It is possible that local minimum wages, inflation rates, or other economic dynamics result in meaningful improvements in children’s mental health that we fail to capture at the state level.

Even so, our findings suggest that raising the minimum wage — at least in the range of wages that we consider — is unlikely to substantively improve children’s mental health. We cannot rule out the possibility of very modest effects, nor can we comment on the potential consequences of more ambitious raises in the minimum wage. However, while there are many social, economic, and political reasons that policymakers might raise the minimum wage, those looking to improve the mental health of children might consider an alternative set of structural interventions.

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**Table 1. Characteristics of children in the NSCH (2016–2020).**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Unweighted**  N=141,427 | | **Wt.** |
| **Child’s age\***  Mean (SD)  Range | 11.7 (4.4)  3–17 |  | 11.1 (4.3)  3–17 |
| **Child’s sex**  Male  Female | 72,965  68,462 | 52%  48% | 51%  49% |
| **Child’s race/ethnicity**  White, non-Hispanic/Latino  Black, non-Hispanic/Latino  Hispanic/Latino  American Indian or Alaska Native  Asian, Native Hawaiian, or Pacific Islander  Other or mixed race | 98,521  8,233  16,601  754  7,823  9,495 | 70%  6%  12%  1%  6%  7% | 52%  12%  25%  <1%  5%  5% |
| **Family structure**  Two parents, married  Two parents, not married  Single parent  Another family structure | 104,553  8,888  27,664  322 | 74%  6%  20%  <1% | 69%  8%  23%  <1% |
| **Highest education of any adult in household**  Less than high school  High school (including vocational or similar)  Some college or associate degree  College degree or higher | 3,144  17,225  32,379  88,679 | 2%  12%  23%  63% | 9%  19%  22%  51% |
| **Household nativity**  First-generation household  Second-generation household  Third-generation household or higher | 2,742  22,770  115,915 | 2%  16%  82% | 3%  25%  72% |
| **Federal poverty level of household**  Less than 100%  100% to 199%  200% to 299%  300% to 399%  400% or greater | 12,976  22,763  25,217  23,606  56,865 | 9%  16%  18%  17%  40% | 17%  22%  18%  14%  30% |
|  |  |  |  |

**Notes:** Estimates with and without the NSCH survey weights are provided. \*Age is shown as continuous but treated as categorical in all TWFE and difference-in-differences models.

**Table 2. Characteristics of adolescents in the YRBSS (2001–2019).**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Unweighted**  N=1,246,623 | | **Wt.** |
| **Adolescent’s age**  12 years old or younger  13 years old  14 years old  15 years old  16 years old  17 years old  18 years old or older | 3,068  3,746  168,397  331,359  330,158  280,056  129,839 | <1%  <1%  14%  27%  26%  22%  10% | <1%  <1%  11%  26%  26%  23%  14% |
| **Adolescent’s sex**  Male  Female | 609,783  636,840 | 49%  51% | 51%  49% |
| **Adolescent’s race/ethnicity**  White, non-Hispanic/Latino  Black, non-Hispanic/Latino  Hispanic/Latino  American Indian or Alaska Native  Asian, Native Hawaiian, or Pacific Islander  Other or mixed race | 709,581  167,313  212,717  28,604  69,540  58,868 | 57%  13%  17%  2%  6%  5% | 56%  17%  29%  1%  4%  2% |
| **Adolescent’s grade**  9th grade  10th grade  11th grade  12th grade | 355,005  337,188  304,791  249,639 | 28%  27%  24%  20% | 28%  26%  24%  22% |
|  |  |  |  |

**Notes:** Estimates with and without the YRBSS survey weights are provided.



**Figure 1. Effective minimum wages for each state from 2001 to 2020.**

**Notes:** We use the higher of a state’s minimum wage or the federal minimum wage, not adjusted for inflation, based on data from the Bureau of Labor Statistics. The range is $5.15 to $14.

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**Figure 2. Association between state minimum wages and the mental health outcomes of children, aged 3–17, in the NSCH from 2016–2020.**

**Notes:** The coefficients provide the percentage-point response in children’s mental health outcomes as a state’s effective minimum wage rises by $1. Based on OLS TWFE models using children aged 3–17 in the NSCH from 2016 to 2020. All models are adjusted for state and year fixed effects. Fully adjusted models also control for each child’s demographic characteristics as well as state policy controls, as described in the Methods. Standard errors are clustered at the state level. 95% confidence intervals are provided. N = 114,163 to 141,094. Sx. = symptoms.



**Figure 3. Association between state minimum wages and the mental health outcomes of adolescents, aged 12–18, in the YRBSS from 2001–2019.**

**Notes:** The coefficients provide the percentage-point response in adolescents’ mental health outcomes as a state’s effective minimum wage rises by $1. Based on OLS TWFE models using children aged 12–18 in the YRBSS from 2001 to 2019. All models are adjusted for state and age-by-year fixed effects. Fully adjusted models also control for each adolescent’s demographic characteristics as well as state policy controls, as described in the Methods. Standard errors are clustered at the state level. 95% confidence intervals are provided. N = 922,636 to 1,218,309.