Center for Advanced Studies in Child Welfare

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RESEARCH BRIEF

Effects of School-based Mental Health Services on Youth Outcomes in Hennepin County

Purpose of the Study

Placing mental health clinicians in K-12 schools is a promising policy approach to improve mental health services for youth and to improve youth outcomes. We aimed to understand how the introduction of school-based mental health services in Hennepin County, Minnesota between 2001-2019 affected a range of student outcomes.

Background & Purpose

While the consequences of mental health problems in childhood and adolescence on health, human capital, and economic-related outcomes are well-established, less is known about how mental health services interventions affect these outcomes.

The prevalence and implications of mental health problems among children and adolescents are well-established. Compared to youth without mental health challenges, youth who struggle with mental health issues are more likely to have poorer academic outcomes, greater use of public assistance in early adulthood (Currie et al., 2010), and increased criminal behavior in early adulthood (Anderson et al., 2015; Cornaglia et al., 2015). Childhood psychological problems are also associated with long-term consequences, including poor labor market and marital outcomes into middle-aged adulthood (Goodman et al., 2011).

While the consequences of mental health problems in childhood and adolescence on health, human capital, and economic-related outcomes are well-established, less is known about how mental health services interventions affect these outcomes. Policies and interventions that facilitate diagnosis and improve treatment of mental health disorders might improve a range of youth outcomes, but, as noted by Currie (2020), there is a paucity of economic research on what intervention strategies are most helpful and cost-effective for addressing mental health problems among adolescents.

In this study, we examine a specific intervention, school-based mental health (SBMH) services, that places mental health clinicians in school settings to improve the diagnosis and treatment of mental health problems among school-age children. Our research questions are:

1. ***What are the effects of schools introducing school-based mental health services on: (a) student outcomes related to mental health service use; (b) academic outcomes such as attendance, test scores, and disciplinary actions; and (c) juvenile justice involvement?***
2. ***Do these effects vary by a range of student characteristics, including by an estimated risk of mental health problems?***

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Methods

Through Minn-LInK, we linked information on the adoption of school-based mental health services (SBMH) in Hennepin County schools from 2001-2019 with administrative data on Medicaid mental health services use, academic outcomes, juvenile justice involvement, and child welfare involvement. We then assessed changes in outcomes after schools adopted school-based mental health services.

We collected novel, detailed information about which K-12 public schools in Hennepin County implemented school-based mental health services, and when they implemented those services between 2001 and 2019. Through Minn-LInK, these policy data were merged with detailed administrative data for individual students in Hennepin County between 2001 and 2018 alongside student survey data (available every three years). The administrative data included information on student demographics, school attendance, disciplinary actions, test scores, juvenile justice involvement, Medicaid enrollment and service use, and child welfare involvement.

We used difference-in-differences statistical models to estimate how implementation of school-based mental health services affected outcomes, along with how effects varied by student characteristics. Difference-in-differences models are an econometric method for estimating causal effects with non-experimental data, under the assumption that treated and untreated units would have had parallel trends in the outcomes in absence of the intervention (Borusyak, et al. 2021). We estimated versions of the models with and without student-level sociodemographic covariates. We also estimated stratified models along dimensions, including predicted risk of mental health problems built off machine learning-models of mental health problem risk using the nationally-representative National Health Interview Survey.

Findings

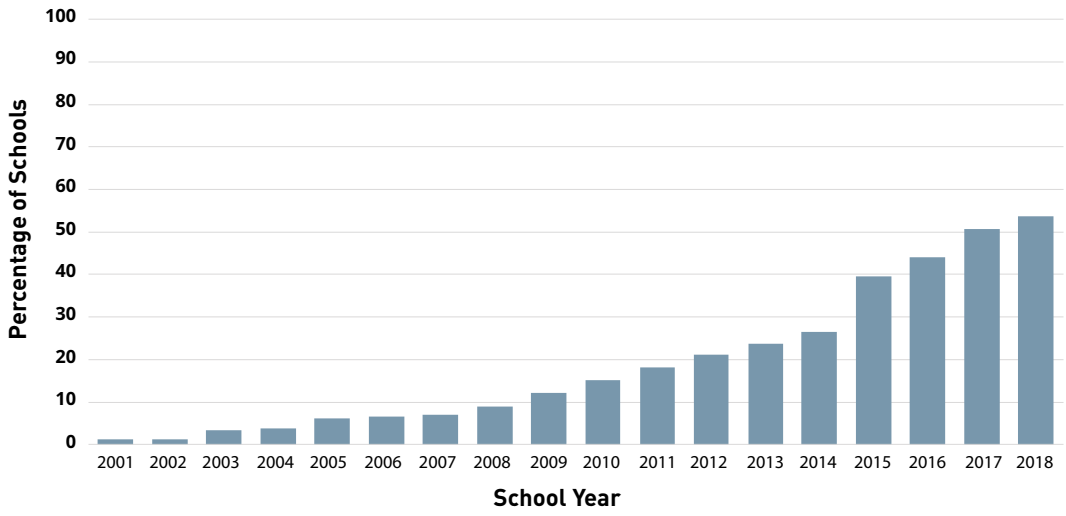
After schools implemented school-based mental health services, mental health services utilization significantly increased, and in-school disciplinary actions decreased. There were no statistically significant improvements in juvenile justice involvement or test scores overall. Stronger and more-uniformly positive outcomes were found for students predicted to be "high risk" for mental health problems.

The first SBMH programs started in five Minneapolis schools in the 2005-06 academic year, with funding from Minneapolis Public Schools. Since then, SBMH expanded more rapidly as the State of Minnesota offered grant funding to support SBMH in 2008. Of the 263 schools in our data, 123 adopted SBMH by the end of the study period. The expansion of SBMH across schools in Hennepin County is described in Figure 1.

"Positive Behavior" Outcomes

Among the overall population of students, offering SBMH services does not appear to affect school attendance rates or achievement on standardized tests (Table 1). Students average 94.2% of school days attended. When conditioning on individual student covariates, we did not find an effect of SBMH on attendance rate. The average treatment effect on the treated (ATT) estimate for standardized test scores with student covariates is not statistically significant, though the effects become more negative with elapsed time.

Figure 1. Trend in SBMH Adoption Across Hennepin County Schools



"Negative Behavior" Outcomes

SBMH seems to reduce suspensions in the overall sample, as measured by the share of students having any out-of-school suspensions in an academic year (Table 1). Only 3.8% of all students are suspended from school annually. SBMH is estimated to significantly reduce the probability of any student being suspended in an academic year after conditioning on student covariates (p = .038). This model estimates a 0.5 percentage point reduction in suspension probability, corresponding to a 14% relative decline. We do not find an effect on the probability of students being involved in a juvenile justice case initiated in a given year. On average, only 0.5% of students have a case annually. Conditioning on covariates, the estimated effect is a non-significant -0.04 percentage points. This reduction is 9% of the mean, so substantial in relative terms but small in absolute terms.

Table 1. Average Treatment-on-Treated Effects of School-based Mental Health Services on School and Delinquency Outcomes

	Average Daily Attendance	Standardized Test z-score *(subjects pooled)*	Any Out-of-School Suspension	Any Juvenile Justice Case Initiated
ATT	0.0004	-0.0140	-0.0053	-0.0004
Standard Error	(0.0018)	(0.0160)	(0.0026)	(0.0005)
P-value	0.842	0.384	0.038	0.403
Individual Covariates	X	X	X	X
Sample Mean	0.942	-0.026	0.0383	0.0047
N	2,528,624	1,754,574	997,579	853,319

Note. *Average Treatment-on-Treated (ATT) effects estimated with the Borusyak et al. (2021) estimator. Individual covariates include fixed effects for age, racial/ethnic group, sex, and free/reduced lunch status.*

Mental Health Services Use

We examined patterns of psychotropic drug use and outpatient mental health therapy use, including services that were delivered both within and outside of school settings.

Table 2. Average Treatment-on-Treated Effects of School-based Mental Health Services on Mental Health Services

	Any MH Medication	Psychotherapy Services	Psycho-social Services	Outpatient MH Services at School	Outpatient MH Services or Psychotropic Drug
ATT	0.0053	0.0157	0.0025	0.0037	0.0156
Standard Error	(0.0036)	(0.0039)	(0.0019)	(0.0012)	(0.0047)
P-value	0.143	0.000	0.182	0.002	0.001
Individual Covariates	X	X	X	X	X
Sample Mean	0.1108	0.1223	0.0301	0.0077	0.1807
N	401,387	401,387	401,387	401,387	401,387

Note. *Average Treatment-on-Treated (ATT) effects estimated with the Borusyak et al. (2021) estimator. Individual covariates include fixed effects for age, racial/ethnic group, sex, and free/reduced lunch status. Sample restricted to students enrolled in Medicaid.*

To the extent that SBMH increases the identification of mental health problems, we would expect to see increased service use even outside of school settings. We did not find any statistically significant change in the use of overall psychotropic drugs in a school year after schools adopted SBMH (Table 2). Within specific drug classes, we find statistically significant effects on antidepressants, anxiolytics, antipsychotics, and mood stabilizers, in models with and without student covariates. Each of these average treatment on treated effect estimates correspond to at least 10% relative increases compared to the sample means for those four drug classes. In contrast, we do not find any evidence that SBMH adoption affected the use of stimulant drugs, which is the most common drug class.

There were few consistent patterns of results after stratifying models by grade level, gender, race/ethnicity, household economic status, Medicaid enrollment, and child welfare system involvement. However, we did find consistently more positive effects of SBMH for the subgroup of students who were identified as "high risk" of mental health problems.

Turning to non-medication outpatient mental health services, we see a statistically-significant increase in the use of outpatient mental health services with a place-of-service code for school of 0.0037, corresponding to a 48% relative increase. We also find that outpatient mental health service use in all settings increases after schools implement SBMH. The ATT effect of SBMH on any psychotherapy services is a statistically-significant 0.016 increase with student covariates, corresponding to a 16% relative increase compared to the sample mean. Combining any use of psychotropic drugs, psychotherapy, or psychosocial services into an indicator of any outpatient mental health services use inside or outside of schools, SBMH adoption led to a statistically significant increase of 1.6 percentage points in the model with student-level covariates, corresponding to a 9% relative increase in the use of any outpatient mental health services.

Stratified Models Results

There were few consistent patterns of results after stratifying models by grade level, gender, race/ethnicity, household economic status, Medicaid enrollment, and child welfare system involvement. However, we did find consistently more positive effects of SBMH for the subgroup of students who were identified as "high risk" of mental health problems. For that group, we found significant increases in attendance, significant reductions in suspensions, no effects on test scores, no effects on juvenile justice involvement, and relatively larger effects on mental health services use.

Conclusion

This research aimed to evaluate the effects of a promising and increasingly popular approach to improve identification and treatment of child and adolescent mental health problems, school-based mental health services. We examined the case of Hennepin County, where many K-12 schools adopted the SBMH model between 2001-2019. As such, this is an opportunity to learn both about how expanding mental health services affects human capital-related outcomes along with evaluating this specific model.

Limitations

A major limitation of this research is that we were unable to directly identify which students used school-based mental health services or how many services were received; we can only observe whether services were offered in a school-year that was attended by each student. Additionally, the study is limited to a single county, and health services use data are limited only to students enrolled in Medicaid.

When considering the full population in our data of K-12 public school students in Hennepin County, Minnesota, we find little evidence that academic and juvenile justice outcomes improved after implementation of SBMH. We see some evidence of decreases in suspensions after schools adopted SBMH. We estimate the SBMH led to modest increases in the use of outpatient mental health services for children on Medicaid, which appear similar in magnitude to other research on mental health treatment interventions and human capital outcomes. In related research with data from the Minnesota Student Surveys, we also find some evidence that SBMH lead to decreases in suicidality among students (Golberstein et al., 2022). All of the outcomes that we studied were short-term outcomes relative to the adoption of SBMH, and it is possible that there are longer-term benefits of exposure to SBMH that we were not able to measure.

As policymakers grapple with how to best address the crisis of child and adolescent mental health, information on the costs and benefits of different interventions is critical. Our results imply some important potential benefits to the school-based mental health model, which may be concentrated in a subset of higher-risk children. Other potential benefits, such as reduced time and hassle, and costs of obtaining services, for both children and parents, were not quantified here. As schools continue to be an important place for identifying and treating mental health problems, additional research to further quantify costs, benefits, and optimal size of school-based services will be valuable.

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Please Note: The results described in this brief represent research that is still in-progress, and which is currently undergoing peer review.