Impact of a School-Based Mental Health Program on Academic Outcomes

David J. Cipriano, PhD; Samuel A. Maurice, PhD

ABSTRACT

Background: Academic achievement is an important indicator of a child's functioning and is inextricably linked with mental health. Prevalence rates of mental illness among children are alarmingly high, while relatively few receive treatment. Increasing accessibility to appropriate care is a major objective of school-based mental health programs. Providing mental health care in the schools should result in improved accessibility to care, decreased distress, and improved academic outcomes.

Methods: We followed 465 children in a large, urban school district who had been referred for school-based mental health services across 1 academic year. Outcomes including attendance, office disciplinary referrals, suspensions, and academic achievement were collected.

Results: Participation in school-based mental health was associated with lower rates of suspensions and higher math achievement scores. Dose-dependent relationships were found for attendance and suspensions.

Conclusions: School-based mental health care may improve access to treatment, thereby addressing health care inequities, and was associated with improvement in academic achievement and school-related behaviors.

BACKGROUND

Prevalence rates for mental health problems among US children range from 9.4% for anxiety in children and adolescents to 20.9% for major depression among adolescents.[1] These numbers have risen since the COVID-19 pandemic.[2] Yet, the number of children who receive mental health care is well below these prevalence estimates.[1] Socioeconomic disparities in mental health outcomes exist in the US indicating that these numbers are likely worse in impoverished communities.[3] Barriers to access to mental health care include stigma and lack of information for many families. Restricted access in impoverished communities is driven primarily by maldistribution of behavioral health providers.[4] Lack of transportation, scheduling difficulties, lack of health insurance and unresponsive providers further contribute to restricted access to care.[5] School-based mental health services are at the forefront of recommended actions to address access to care and treatment delays.[6]

School-based mental health care is believed to increase access to services.[7] Access is improved through less parental time off work, reduced childcare, decreased transportation needs, nonstigmatizing environment, and time and cost savings.[7,8] Students and their families may be more comfortable with mental health treatment as they see the provider as part of the school environment interacting with staff and other students. School-based health centers naturally improve access given that approximately 95% of youth ages 7 to 17 attend school every day.[9] In fact, some have acknowledged that our nation's schools are already the de facto provider of mental health services to our youth.[10]

Children living in impoverished or marginalized communities face barriers to academic achievement as well. Inequities by race, ethnicity, and income in educational achievement are well documented.[7] The significant opportunity gaps that exist between middle- and low-income children at school entry widen over time and contribute to differences in educational attainment and employment potential in the long term.[11] Placing mental health professionals in schools is thought to reduce these disparities.[7,10]

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Children's psychological health is essential for their academic success.[12] However, academic outcomes are not always measured in studies of school-based mental health services, with some exceptions.[13-16] For example, Kase and colleagues were able to find only 36 articles from the previous 17 years that reported on the impact of school-based mental health on academic outcomes.[15] Academic outcomes include indices of classroom behavior in addition to achievement markers. Such behavioral outcomes include disciplinary actions and attendance. These are considered barriers to learning[14] and may be affected by psychosocial intervention.[17] The impact of school-based mental health on academic outcomes generally has been found positive though modest.[15]

Two research questions guided this study: (1) To what extent did students who participated in school-based mental health treatment evidence more adaptive levels of the behavior-based outcomes of attendance, office disciplinary referrals, and suspensions when compared to students who did not receive treatment (but who also were identified as having behavioral or emotional needs worthy of treatment)? and (2) To what extent did students who participated in school-based mental health treatment evidence higher levels of change over time on academic outcomes compared to students who did not receive treatment (but who also were identified as having behavioral or emotional needs worthy of treatment)?

Table 1. Sample Demographics Stratified by Intervention Condition

	Total	Treatment	Comparison	χ^2	*P* value
Gender %					
Female	32.7	32.5	33.9	0.071	.789
Male	67.3	67.5	66.1		
Ethnicity %					
American Indian	0.7	0.8	0.0		
Asian American	1.4	1.6	0.0		
Black	81.9	81.6	82.3	1.090	.297
Latin(x)	12.2	11.6	16.1		
White	2.7	3.1	1.6		
Multiracial	1.1	1.3	0.0		
Free and reduced lunch %					
Yes	94.4	93.7	96.8	1.537	.215
No	5.6	6.3	3.2		
English language learner %					
Yes	7.1	6.1	12.9	5.649	.017
No	92.8	93.7	87.1		
Unknown	0.1	0.1	0.0		
Special education %					
Yes	32.5	35.7	29.0	1.844	.175
No	67.5	64.3	71.0		

Note: Percentages are based off a total sample size 465 students, with 341 students in the treatment group and 124 students in the control group. Chi-square test for ethnicity and control/treatment group was only conducted for Black and Hispanic students due to low sample sizes.

METHODS

Participants

Students in Milwaukee Public Schools (MPS) who were referred to a school-based mental health program were the study participants. The MPS system has over 68 000 students: 14% are English-language learners and approximately 91% are students of color. The study participants are largely representative of these demographics. Typical criteria for identification included behavior problems exhibited in the school, student or parent complaint of psychological problems, and academic underachievement not otherwise explained by learning difficulties. Students were considered for services regardless of insurance coverage. The only exclusion criteria were parental refusal to consent for treatment or referral by the team to a more appropriate level of care not offered within the school. There were 22 schools participating in the program at the time of this study. Four of these were private "voucher" schools chartered by MPS and served the same constituency as MPS. However, these private schools did not provide data on school-related behavior or administer the STAR Reading and Math exams. Therefore, they were excluded from the final analyses.

There were 499 students referred for treatment; 34 declined the referral. A total of 341 students and their parent or guardian agreed with the referral, signed the consent form, and entered treatment. The remaining group of 124 children comprised the comparison group. This comparison group consisted of students who were referred for school-based mental health services, completed the consent process, but did not go on to start services. The reasons for this are varied and ultimately rested with the child and their parent or guardian (ie, they decided not to go through with treatment after initially consenting to do so). There is no anecdotal data that this group was more likely to be referred to a higher level of mental health care, which would obviously bias the results in favor of the treatment group. The two groups were similar on demographic characteristics such as gender, ethnicity, and economic status. We followed these 465 children who were referred during academic year 2016-2017.

Instrumentation

The STAR evaluation is a group-administered, school-wide measure of academic achievement (Renaissance Learning, Inc). It has widely accepted psychometric properties and is commonly used across the United States. This assessment tool is administered 3 times during the school year. For the purposes of our study, we analyzed the differences in the reading and math subject areas between the fall and spring administrations of the academic year. Scaled scores were used for the calculation of change, and a positive difference indicated growth in this area.

Indices of classroom behavior included office referrals for disciplinary actions (eg, for disruptive behavior or other relatively minor rule infractions), suspensions, and school absences. Such measures have high potential for bias when applied to children

Table 2. Estimates From Two-level Hierarchical Linear Models Predicting School Attendance

	Model 1	Model 2
Fixed effects		
Intercept	0.8643[a]	0.8685[a]
2014-2015 school attendance		0.4651[a]
Treatment		0.0126
Error variance		
Level 1	0.00974[a]	0.0088[a]
Level 2	0.00112	0.0005
Model fit		
Akaike Information Criterion (AIC)	-447.10	-385.90
Bayesian Information Criterion (BIC)	-444.40	-381.40

[a]Statistically significant, $P < .05$

Values based on SAS PROC MIXED. Lower AIC and BIC values represent stronger models.

Table 3. Estimates From Two-level Hierarchical Linear Models Predicting Office Disciplinary Referrals

	Model 1	Model 2
Fixed effects		
Intercept	4.4999[a]	5.2740[a]
2014-2015 office disciplinary referrals		0.7199[a]
Treatment		1.8358
Error variance		
Level 1	49.9002[a]	47.087[a]
Level 2	4.0649	1.1997
Model fit		
Akaike Information Criterion (AIC)	1787.40	1540.0
Bayesian Information Criterion (BIC)	1790.10	1543.5

[a]Statistically significant, $P < .05$

Values based on SAS PROC MIXED. Lower AIC and BIC values represent stronger models.

Table 4. Estimates From Two-level Hierarchical Linear Models Predicting School Suspensions

	Model 1	Model 2
Fixed effects		
Intercept	2.608[a]	2.197[a]
2014-2015 suspensions		0.663[a]
Treatment		-1.086
Error variance		
Level 1	14.7646[a]	15.144[a]
Level 2	2.1718	0.017
Model fit		
Akaike Information Criterion (AIC)	1474.50	1169.90
Bayesian Information Criterion (BIC)	1477.20	1173.50

[a]Statistically significant, $P < .05$

Values based on SAS PROC MIXED. Lower AIC and BIC values represent stronger models.

Table 5. Estimates from Two-level Hierarchical Linear Models Predicting Spring 2017 STAR Math Scores

	Model 1	Model 2
Fixed effects		
Intercept	541.14[a]	579.37[a]
Fall 2014 STAR math score		0.6275[a]
Treatment		30.12
Error variance		
Level 1	17829.0[a]	8265.57[a]
Level 2	5425.76	308.36
Model fit		
Akaike Information Criterion (AIC)	2733.20	1591.20
Bayesian Information Criterion (BIC)	2735.90	1595.10

[a]Statistically significant, $P < .05$

Values based on SAS PROC MIXED. Lower AIC and BIC values represent stronger models.

from minoritized and marginalized groups. The treatment and comparison groups do not differ significantly on ethnicity and poverty indicators, thus such bias is unlikely to affect the results of this study. These data were pulled by MPS Department of Research, Assessment and Data for each student in the treatment and comparison groups.

Procedure

School Community Partners for Mental Health (SCPMH), a public-private partnership in Milwaukee, Wisconsin, was developed to bring mental health services into the schools. At the time of this study, 4 community-based clinics were providing psychotherapy and consultation to MPS.

Students in need of mental health services – namely psychotherapy – were identified by an MPS student support staff member (eg, school social worker, school psychologist) in conjunction with teachers, administrators, and the community mental health provider (collectively known as the school-based team or "team"). All cases that were referred for mental health treatment by school personnel were tracked for successful entry into treatment.

Once the consent for treatment form was signed by the parent or guardian, psychotherapy sessions were conducted weekly, except in cases where scheduling did not allow or acuity did not necessitate. The majority of sessions were approximately 50 minutes long, and nearly all sessions were individual. The therapists regularly invited parents to sessions in the school and were otherwise reached out to by phone. Other services provided by SCPMH include teacher consultation, team planning meetings, and participation in school-based family activities.

The psychotherapists who saw children in this study used a cognitive-behavioral approach. Providers met monthly for didactics, case discussions, and peer review. The 18 therapists providing services were mostly masters level, licensed psychotherapists (either licensed clinical social worker or licensed professional counselor), though there were 2 doctoral level licensed psycholo-

gists. Approximately one third of these individuals were people of color.

Data Analysis

Hierarchical linear modeling (HLM) was used to answer the research questions. This choice was made to account for the hierarchical data clustering, which was judged to have the potential to impact the results – namely the individual characteristics of the child and the school the participant attended. Two levels of nesting were accounted for in the analyses: individual (student) and school. Analyses controlled for the previous year's functioning on the dependent variables (attendance, office disciplinary referrals, suspensions, and STAR exams). The predictor variable was treatment (involving 2 levels: yes, enrolled in school-based mental health treatment vs no, not enrolled for treatment, though identified as being a candidate for treatment). The intercepts were allowed to vary, but the slopes were fixed due to the fact that no group level predictors were used in building the models. All assumptions of HLM were checked and found to have been fulfilled. All analyses used the maximum likelihood method. Missing data were handled using list-wise deletion. Dose effect analyses were conducted on the behavioral measures. Chi square analyses were conducted for other group comparisons; this was chosen to help manage the large standard deviations seen in the data.

RESULTS

The subjects were 66% male; 82% were Black, 12% were Latin(x) and 3% were White. Most (94%) were living at or below the poverty level. Ninety-five percent were in the elementary grades (kindergarten through 8th grade), and the other 5% were in grades 9 through 12. See Table 1 for demographic data.

The treatment and comparison groups are quite comparable across gender, race/ethnicity, grade, and eligibility for Food Service (an indicator of low socioeconomic status). The comparison group did have significantly more English as a Second Language (ESL) students compared to the treatment group (Table 1). This raises the question of language being a prohibitive factor in this subgroup's decision to not enter treatment despite having been referred and having signed the consent form. SCPMH does have the consent form and the SDQ in Spanish language versions. It also has at its disposal a translation service. The mean number of sessions was 13.14 (SD = 9.81) with a range from 1 to 41 sessions. The median number of sessions attended was 11.00.

Over the course of the 2016-2017 school year, 499 children were referred by school personnel to mental health treatment; 341 entered treatment through the school-based mental health program. This number, representing 68% of those referred, is considerably higher than national estimates of 50% or less.[1,18] Incidentally, before the formation of SCPMH, MPS personnel calculated that approximately 5% of students referred to services started treatment. These findings demonstrate the utility of school-based mental health in increasing access to mental health care for children, perhaps especially those from marginalized or underserved communities who were the subject of this study.

Research Question 1

Do students receiving treatment have significantly better behavior-based outcomes, including attendance, office disciplinary referrals, and suspensions relative to students who do not receive treatment?

Attendance

Participants in the treatment group did not have significantly higher attendance rates in the 2016-2017 school year than those in the comparison group, $F(1, 193) = 0.73$, $P = .39$ (Table 2). Dose effect analyses were conducted. The number of therapy sessions did significantly predict attendance rate after controlling for the corresponding pre-outcome (ie, pretreatment) attendance. The full model predicting attendance percentage was significant, $F(2, 268) = 37.30$, $P < .0001$. The number of therapy sessions ($\beta = 0.0012$) was indeed a significant predictor of 2016-2017 attendance, $t(1) = 2.23$, $P < .05$, after controlling for the previous year's attendance, $t(1) = 8.25$, $P < .0001$. For each additional therapy session, student attendance percentage during the 2016-2017 school year was predicted to increase by approximately 0.1% percentage points after controlling for pretreatment attendance percentage. Practically speaking, this means that a student who attends 10 therapy sessions will be predicted to attend almost 2 more days of school each academic year (based on a 180-day academic calendar). The fact that children who have better attendance are more available for therapy sessions is a potential confounding variable in these analyses.

Office Disciplinary Referrals

Participants in the treatment group did not have significantly fewer office disciplinary referrals in the 2016-2017 school year than those in the comparison group, $F(1, 209) = 3.65$, $P = .0575$. There was no dose effect found for office disciplinary referrals (Table 3).

Suspensions

Participants in the treatment group had significantly fewer suspensions in the 2016-2017 school year than those in the comparison group, $F(1, 209) = 4.54$, $P = .034$ (Table 4). In addition, a dose effect was found for suspension rate. In terms of predicting 2016-2017 school suspensions, the full model was again significant, $F(2, 268) = 34.16$, $P < .0001$. The number of therapy sessions ($\beta = -0.067$) was a significant predictor of school suspensions, $t(1) = 3.01$, $P < .01$, after controlling for the previous year's school suspensions, $t(1) = 7.96$, $P < .0001$. For each additional therapy session, the number of school suspensions a student is predicted to accrue during the 2016-2017 school year was expected to decrease by approximately 0.067 after controlling for pretreatment school suspensions. In real terms, the model predicts that if a student attends 15 therapy sessions, they will be expected to have 1 fewer

day of school suspension even after controlling for pretreatment functioning.

Research Question 2

Do students in the treatment group have significantly greater academic outcomes than those in the comparison group? As would be hoped, all students (in both the treatment and comparison groups) showed improvement in these academic markers over the course of the study. In terms of the effect of treatment on academic outcomes, STAR Math and STAR Reading were analyzed.

STAR Math

Students (level 1) in the sample are nested within 18 schools (level 2), with an average of 11.89 students per school. The intraclass correlation was found to be 0.23, indicating that approximately 23% of the variability in STAR math scores can be accounted for by level 2 (school) group membership. After controlling for the previous fall STAR Math test, students in the treatment group did not have significantly higher scores on the spring 2017 STAR Math test than those in the comparison group, $F(1, 115) = 2.62$, $P = .11$. While students who received treatment ($M_{math} = 606.49$) scored higher than those in the comparison group ($M_{math} = 576.37$) this increase was modest relative to the large standard deviation seen in spring 2017 STAR Math scores ($SD = 151.23$). See Table 5.

The large standard deviations for STAR Math scores in both groups ($SD_{treatment} = 111.02$ and $SD_{comparison} = 101.56$) warranted a further look. After exploratory analysis, it was revealed that there were significant outliers in the treatment group in terms of STAR Math scores. Findings like these are not unusual in such a data set.[13] To account for this, students were categorized into 2 conditions for each academic year: growth or no growth. Students who demonstrated growth on STAR Math over the course of the study were put into the growth category; students who did not demonstrate growth (or who regressed) were put into the no growth category. Growth represented any nonzero positive change. The mean range of change was 135.91 for the treatment group and 92.38 for the comparison group.

A chi-square test of independence was performed to examine the relation between STAR Math growth and treatment. The relation between these variables was significant, $\chi^2([2]\ N = 171) = 14.22$, $P < .001$. Students who received therapy were more likely to show at least some growth on the STAR Math test (95%) than those who did not receive therapy (76%) over the course of the study.

STAR Reading

Students (level 1) in the sample are nested within 18 schools (level 2), with an average of 9.94 students per school. The intraclass correlation was found to be .134, indicating that approximately 13% of the variability in STAR Reading scores can be accounted for by level 2 (school) group membership. After controlling for the previous fall STAR Reading scores, students in the treatment group did not have significantly higher scores on the spring 2017 STAR Reading test than those in the comparison group, $F(1, 100) = 0.15$, $P = .70$. Large standard deviations were found again for both groups. However, analyses controlling for outliers—similar to those performed for the STAR Math tests—were performed without significant results.

DISCUSSION

Offering mental health services in schools to children from disadvantaged communities may improve access to care. Approximately 68% of students who were identified as having a mental health need ultimately were seen by a professional through this school-based mental health initiative. This is higher than rates found in previous studies.[5,18] Given that the present study involved a traditionally hard to reach and underserved population, our results contribute to the belief that school-based mental health has the potential to advance health equity.[7]

A major aim of this study was to show that the provision of mental health services at schools would benefit classroom performance. Students receiving psychotherapy through SCPMH had significantly lower numbers of suspensions than those in the comparison group. For those students receiving mental health care, there was a dose effect found for absence from school and suspensions: more therapy sessions predicted lower rates of these school-related behaviors. These behavioral variables have been conceptualized as potential barriers to academic achievement, and our findings suggest that mental health treatment may have a positive impact on them.[14,17] After statistically controlling for the wide variability in our sample (which is actually developmentally appropriate), we found school-based mental health treatment to be associated with more growth on a standardized math test over the course of the school year. This is in line with previous research and reinforces the notion that children's mental health is linked to their academic performance.[12,15]

Limitations

This study was hampered by the lack of a true control group and random assignment. We sought further statistical control by holding the previous year's functioning constant in the analyses. The large standard deviations in the academic data rendered standard analysis of variance approaches somewhat limited. We decided to use chi-square analysis, which manages such scatter. Nonetheless, we acknowledge that this weakens any conclusions to be made from the relationship between treatment and math achievement scores. We also did not control for multiple comparisons on variables that may have some degree of shared variance. It was our judgement at the time that the shared variance of the nesting variables (school building and the individual student) were more likely to have an impact on the results, hence the choice to use hierarchical linear modelling. Finally, we also did not have data on educational interventions or ancillary services that our subjects also

may have had at their disposal, raising the question of potential confounding variables at play.

Future Directions

Future research should address other mechanisms through which school-based mental health impacts children's functioning. For example, do the other roles that mental health professionals play in schools also affect change, such as consultation with teachers and administrators? Does this hoped-for partnership between educators and mental health professionals serve to decrease stigma surrounding mental health, which would facilitate the continuum of mental health promotion that Weist and colleagues spoke about?[19] Beyond mental health and academic outcomes, we should be studying systemic variables that may be related to children's functioning, such as connectedness to school.

CONCLUSIONS

School-based mental health care may improve access to treatment, thereby addressing health care inequities, and was associated with improvement in academic achievement and school-related behaviors in our study population.

For more information about school-based mental health in Wisconsin, visit the website for the Coalition for Expanding School-Based Mental Health at https://www.schoolmentalhealthwisconsin.org/ or the Wisconsin Association of Family and Children's Agencies at https://www.wafca.org/.

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