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RESEARCH ARTICLE

Chronic Childhood Trauma, Mental Health, Academic Achievement, and School-Based Health Center Mental Health Services

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ABSTRACT

BACKGROUND: Children and adolescents exposed to chronic trauma have a greater risk for mental health disorders and school failure. Children and adolescents of minority racial/ethnic groups and those living in poverty are at greater risk of exposure to trauma and less likely to have access to mental health services. School-based health centers (SBHCs) may be one strategy to decrease health disparities.

METHODS: Empirical studies between 2003 and 2013 of US pediatric populations and of US SBHCs were included if research was related to childhood trauma's effects, mental health care disparities, SBHC mental health services, or SBHC impact on academic achievement.

RESULTS: Eight studies show a significant risk of mental health disorders and poor academic achievement when exposed to childhood trauma. Seven studies found significant disparities in pediatric mental health care in the US. Nine studies reviewed SBHC mental health service access, utilization, quality, funding, and impact on school achievement.

CONCLUSION: Exposure to chronic childhood trauma negatively impacts school achievement when mediated by mental health disorders. Disparities are common in pediatric mental health care in the United States. SBHC mental health services have some showed evidence of their ability to reduce, though not eradicate, mental health care disparities.

Keywords: school-based health centers; chronic trauma; child mental health; academic achievement; pediatric health care.

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Chronic childhood trauma is a major social and public health problem in the United States. Approximately 80% of US children and adolescents have experienced childhood trauma in the form of victimization.[1] Exposure to childhood trauma is associated with academic problems, emotional and behavioral difficulties, sexually risky behavior, and substance use.[2] Current estimates indicate that 1 in 5 children and adolescents have a diagnosable mental health disorder that can cause severe lifetime impairment.[3] Yet, up to 70% of children and adolescents with mental health disorders do not receive mental health services, with minorities and lower socioeconomic youths disproportionately not receiving treatment.[3,4] Mental health disorders negatively impact social and academic functioning with related decreased opportunities for educational, employment, and social mobility advancement.[5-9] Untreated mental

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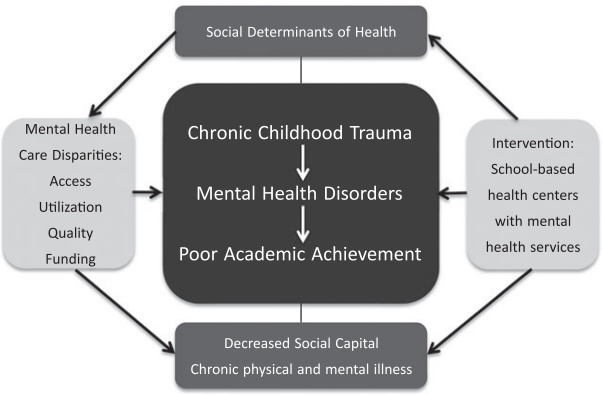
health disorders can lead to severe disability and even death from suicide.[3,10,11]

Schools are an important point of contact for prevention, identification, and treatment of mental health issues and disorders.[12] Schools have increasingly become the focus for health interventions and services because of their availability and accessibility to students.[13] There is some evidence that school-based health centers (SBHCs) have demonstrated the ability to increase access to and utilization of quality cost-effective health and mental health services for children and adolescents, especially in underserved populations.[14-20] Expanding this model of care has the potential to increase health equity in underserved at-risk youths. The purpose of this paper is to review the literature exploring chronic childhood trauma's impact on academic achievement as mediated by mental health disorders, disparities in child and adolescent mental health care, and the impacts of SBHCs that incorporate mental health services on children and adolescents. This paper contributes to the SBHC literature by reviewing the need for pediatric access, utilization, quality, and funding of mental health care services in the context of chronic childhood trauma.

Conceptual Framework

This paper is guided by a conceptual model created by the authors that combined Link and Phelan's 1995 social determinants of health, Braveman's 2006 measurements of health disparities, and Felitti et al's 1998 study of exposure to childhood adverse events and negative adult health outcomes.[21-23] The model also includes the intervention of a SBHC. As depicted in Figure 1, the social determinants of health, such as education, health care, employment opportunities, work and living conditions, and accessibility of food, are distributed unequally due to social policies and economic opportunities that have been unevenly applied for generations, thereby resulting in health disparities beginning at birth.[24] Children and adolescents living in low socioeconomic households, who represent racial-ethnic minorities, whose parents have achieved low education levels, and/or those living with single parents or step-parents have disproportionately higher rates of exposure to trauma.[1] Chronic childhood trauma includes victimization such as all forms of abuse and neglect, witnessing family violence, discrimination based on race/sex/sexual orientation/religion, or having a close friend/family member murdered.[1,25] Other adverse events include poverty, food insecurity, parental substance abuse, parental unemployment, episodes of homelessness, marital discord, parental mental illness, and parental incarceration.[1,25] The model shows that children and adolescents exposed to chronic childhood trauma are at increased risk for developing mental health disorders.[26-37] Mental

Figure 1. **Conceptual Framework**



health disorders have been linked to a greater risk for poor academic achievement.[5,6,38,39] Poor academic achievement leads to lower levels of social capital and decreased ability to escape exposure from adverse events, chiefly poverty, and thus, the cycle of exposure to chronic trauma is transmitted from generation to generation.[40]

Figure 1 shows, the SBHC that incorporates mental health services is one strategy to intervene in the chronic health trauma cycle. The SBHC is a model of pediatric primary care delivery that offers comprehensive services provided by a multidisciplinary team on school grounds.[18] Studies have shown SBHCs increase access to health and mental health care, especially for the ''hard to reach'' and high-risk adolescent population, as well as minority and lower socioeconomic pediatric populations.[14-20] Multiple studies have documented how SBHCs overcome typical barriers to care: (1) lack of insurance coverage; (2) inability to access care because of lack of transportation, limited clinic hours, or language barriers; (3) national shortage of mental health providers; (4) lack of coordination of care with providers, families, and schools; (5) lack of culturally sensitive or age-appropriate services; (6) lack of screening by health care providers or schools; (7) lack of confidentiality for adolescents; and (8) stigmatization of persons requiring mental health services.[14-18] SBHCs have demonstrated the ability to increase school attendance, improve academic scores, decrease school dropout, and provide cost-efficient high-quality care, and adolescents have favorable attitudes toward their use.[16,39,41-46] The expansion of the SBHC with mental health services is a structural intervention that may have the potential to reduce the inequalities currently documented in pediatric mental health that continue to exacerbate disparities in school achievement that in turn perpetuate income inequality disparities and increased exposure to chronic trauma in the United States.

METHODS

A search of the PsycINFO and PubMed databases was conducted. Empirical studies and literature reviews conducted in the past 10 years of US child and adolescent populations and of US SBHCs between 2003 and 2013 were included. Table 1 lists the search terms used to review the 4 major topics of this paper: childhood trauma's effects, mental health care disparities, and health equity and academic achievement as they pertain to SBHC mental health services.

This search of literature on childhood trauma's effect on academic achievement as mediated by mental health disorders yielded 43 articles (Table 1). Nine of these specifically reviewed the relationship between exposure to childhood trauma and the development of mental health disorders and school success in children and adolescents.

The search for publications on pediatric mental health care disparities in the context of access, utilization, quality, and financing yielded 129 studies (Table 1). Articles that reviewed special subgroup pediatric populations of children and adolescents in juvenile detention, psychiatric inpatient facilities, or youth with intellectual disabilities were excluded. Of the remaining articles, 9 were selected that reviewed disparities in access, utilization, quality, and/or financing of pediatric mental health care.

The search of studies reviewing SBHC mental health service access, utilization, quality, and financing yielded 253 articles (Table 1). Articles reviewing mental health services that were not part of a SBHC were not included. Of the remaining articles, 11 fit the criteria because they examined access, utilization, quality, and/or financing of SBHC mental health services.

The search for articles reviewing SBHC mental health center use and impact on academic achievement yielded 5 studies, 2 of which were specific to SBHC mental health service use by students and impacts on academic achievement as measured by GPA or dropout status (Table 1).

RESULTS

An overview of all the studies in this review is presented in Table 2. This table summarizes the study design, time period, population, and main variables measured. A large number of studies used secondary analysis of cross sectional databases that utilized valid and reliable surveys.

Chronic Childhood Trauma's Impact on the Development of Mental Health Disorders and Subsequent Poor Academic Achievement

Eight out of 10 studies of children and adolescents exposed to chronic childhood trauma show a significant risk of increasing mental health disorders with subsequent poor academic achievement while 2 studies did not demonstrate a significant difference.[2,47-55] For example, 1 study among the 8 that found statistically significant relationships showed that youth, especially those of low-income and/or racial/ethnic minorities, who are exposed to trauma or victimization are at greater risk for developing anxiety, depression, conduct disorder, post-traumatic stress disorder (PTSD), suicidal ideation, attention deficit hyperactivity disorder (ADHD), and have lower GPAs than their peers who have not experienced trauma or victimization.[48] Frequency of victimization had the most significant impact on development of mental health disorders, especially attention problems and poor academic achievement.[2,48,52] Exposure to community violence inversely affected school engagement and performance when mental health disorders were included.[47,49,51,53] Youth exposed to chronic trauma had a higher risk for dropout as mediated by mental health disorders.[50] Mental health symptoms and disorders that predicted poor academic achievement were PTSD, anxiety, aggressive behavior, and depression.[47,49-53] Among the 8 studies with significance, Voisin et al[53] found the effects of violence on academic performance were gendered, with aggressive behavior in females associated with lower GPAs and less student-teacher connectedness, while males with general psychological problems had less student-teacher connectedness, but both of these factors were shown to have minimal effect on GPA.

Two of the 10 studies did not find significant impacts on academic achievement.[54,55] Dating abuse victimization was a significant predictor of substance use of alcohol, cigarettes, and marijuana, but did not predict academic outcomes.[54] Post-childhood sexual abuse PTSD significantly impacted social functioning, but not academic performance.[55] However, both studies utilized self-report of grades, while the other 8 studies that found significant differences in academic outcomes utilized standardized scoring measures.

Mental Health Care Disparities as Measured by Access, Utilization, Quality, and Funding of Pediatric Mental and Behavioral Health Services

Table 3 summarizes studies reviewing US pediatric mental health care disparities in the domains of access, utilization, quality, and funding.[22] Seven studies found significant disparities in child and adolescent mental health care in the United States.[56-63] State of residence significantly impacts use of mental health care, often exceeding the effects race and income play in disparities found in access and utilization of mental health services.[56,63] Insurance coverage plays an important role in enabling children's and adolescents' access to mental health care services.[61]

Table 1. **Literature Review Search Terms**

Search Term	*	Articles That Met Criteria for Inclusion†
Childhood trauma's effect on academic achievement as mediated by mental health disorders		
Childhood trauma, mental health disorders, academic achievement	13	McLean et al[55]
Violence, mental health disorders, academic achievement	9	Busby et al[47]; Mathews et al[49]; Schwartz and Gorman[51]
Childhood trauma, emotional behavioral disorders, academic achievement	6	Overstreet and Mathews[48]; Foshee et al[54]
Victimization, psychosocial functioning, academic performance	5	Holt et al[2]
Childhood trauma, psychiatric disorders, and school dropout	4	Porche et al[50]
Exposure to violence, psychological problems, school engagement	3	Voisin et al[53]
Childhood maltreatment, academic performance	3	Slade and Wissow[52]
Pediatric mental health care disparities in access, utilization, quality, and financing		
Mental health care, utilization, access, children, adolescents, disparity	18	Thomas et al[66]; Cummings et al[58]
Mental health care, quality, pediatrics, disparity	26	
Financing, mental health services, children and adolescents	38	Kapphahn et al[61]
Mental health care, pediatrics, disparity	2	Coker et al[57]; Sturm et al[63]
Health care disparities, access, utilization, child, adolescent, mental health	16	Le Cook et al[62]; Husky et al[60]; Flores and Tomany-Korman[59]
Mental health, child, adolescent, healthcare quality indicators	29	Bethell et al[56]
School-based health center mental health service access, utilization, quality, and financing		
School-based health centers, mental health	46	Anyon et al[64]; Guo et al[16]; Wade et al[20]; Juszczak et al[17]
School-based health centers, access	5	Gibson et al[65]; Soleiman-pour et al[19]
School-based health centers, quality	29	
School-based health centers, financing	52	
School health services, cost	83	Nystrom and Prata[67]
School-based health center mental health service use impact on academic achievement		
School-based health center, academic outcomes	1	Walker et al[39]
School-based health center, academic outcomes	4	Kerns et al[41]

*Number of Articles from Databases PsycINFO and PubMed.
†Articles that appeared in multiple searches were not relisted.

Variations in state law and deficiencies in federal law regarding parity has led to large gaps in coverage of mental health services.[61] Lower family household income significantly predicted less receipt of mental health services among publicly insured families.[57] Among publicly insured families, Asian, black, and Hispanic publicly insured children and adolescents were less likely to receive services.[56] Significant differences were found in racial and ethnic groups in utilization of services, with one study finding Hispanics had the highest unmet need for mental health services.[63] African American and Latino youth had higher reports of mental health symptoms with lower reports of having received mental health care in the past 12 months as compared to white, Native American, and Multiracial youths.[60] Asian American and Pacific Islander youth had low reports of mental health symptoms and the lowest reports of mental health service use among the groups.[59] Initiation of use of outpatient mental health care by black and Latino children ages 5-17 was significantly lower than that for white children.[62] There were no differences in receipt of counseling services among racial/ethnic groups in a school setting, while there were significant differences in receipt of counseling services among racial/ethnic groups in the clinic-based setting with Blacks, Hispanics, Asian Americans, and Pacific Islanders receiving fewer mental health services compared with whites.[58] Rural African-American adolescents had higher rates of participation in mental health screening at a school-based mental health program when compared to white adolescents.[60] Fifth graders with ADHD symptoms were more likely to have received mental health services than those with oppositional defiant disorder, conduct disorder, or depressive symptoms.[57]

Studies examining disparities in quality of pediatric mental health care primarily focused on insurance coverage instead of clinical outcomes. Publicly insured children had more than double the odds of experiencing a gap in coverage when compared with children with private insurance and this gap was significantly influenced by state of residence.[56] Arizona, California, Idaho, Mississippi, Montana, Nevada, New Mexico, North Dakota, and Oklahoma were states with significantly ($p < .05$) lower-than-average national US minimum quality index scores, a measurement of percentage of children with adequate insurance coverage who met medical home criteria and had one or more preventative care visits.[56] Gaps in public insurance coverage were highest among Hispanics and lowest among Asians.[56]

Studies that reviewed funding of mental health services focused on mental health parity and gaps in insurance coverage.[57,62] Mental health care disparities occurred due to a number of factors, including differences in mental health coverage in public insurance between states and between state and federal programs (SCHIP versus Medicaid), reductions in services under managed care systems, and the

Table 2. **Studies of Chronic Childhood Trauma's Impact on Academic Achievement as Mediated by Mental Health Disorders**

Study-Main Author	Study Design	Study Period	Study Population United States	Main Effects Measured (All Include Sociodemographics)	Results
Busby et al[47]	Longitudinal cohort interviews	3 years	491 sixth graders, African American	Community violence, symptoms of depression anxiety aggression, academic functioning	Aggressive behavior mediated the association between exposure to community violence and academic performance
Foshee et al[54]	2° analysis Context Study	2003-2005	3328 rural eighth-tenth graders	Exposure to dating abuse victimization, family conflict, substance use, symptoms of anxiety and mood disorders, grades	Exposure to dating abuse victimization increases the risk of adolescent substance use and, for girls, internalizing symptoms but no impact on grade.
Holt et al[2]	Cross sectional survey		689 urban fifth graders, low SES	Victimization: peer, sibling, maltreatment, sexual, witness to, crime; symptoms of anxiety and depression; grades	Students exposed to multiple forms of victimization are more likely to have psychological distress, academic problems, peer victimization, and to have been victimized sexually
Overstreet and Mathews[48]	Literature review		School-aged children	Chronic trauma, cognitive impairment, academic functioning, mental health care	Children experiencing academic failure, emotional disorders, or both, are more likely to have been exposed to chronic trauma
Mathews et al[49]	Cross sectional survey		47 urban fifth-sixth graders, African American	Exposure to community violence, posttraumatic stress symptoms, school functioning, poverty status	Exposure to community violence is inversely related to academic achievement as mediated by posttraumatic symptoms
McLean et al[55]	Cross sectional survey and interview		90 urban 13- to 18-year-old females in treatment for PTSD	Child sexual abuse, PTSD severity, family functioning, drug use, social competence, school performance	PTSD from child sexual abuse negatively impacts social functioning but not academic outcomes
Porche et al[50]	2° cross sectional analysis CPES	2001-2003	2532 21- to 29-year old	Childhood trauma, psychiatric diagnoses, mental health service use, dropout status	Childhood trauma significantly impacts development of mental health disorders and high school dropout
Schwartz and Gorman[51]	Cross sectional surveys, SAT-9 score, GPA		237 urban third-fifth graders, minority race, low SES	Exposure to community violence, in-class disruptive behavior, bullying by peers, symptoms of depression, academic success	School-aged children exposed to community violence are at risk for symptoms of depression and disruptive behaviors that may negatively impact academic achievement
Slade and Wissow[52]	2° analysis longitudinal study	1994-1995, 2001-2002	132 middle and high school students and paired sibling	Maltreatment index, low birth weight, school performance	Childhood maltreatment is associated with lower GPA. Earlier onset and chronic exposure had a greater effect
Voisin et al[53]	2° cross sectional analysis survey	2006	563 urban high school students, 80% African American	Community violence, marital conflict, gender, problem behaviors, school engagement	In home and community violence exposure negatively impacts school success when mediated by psychological problem behaviors

CPES, Collaborate Psychiatric Epidemiological Survey; GPA, grade point average; PTSD, post-traumatic stress disorder; SES, socioeconomic status; SAT, Standard Achievement Test 9th ed.

Table 3. **Studies of Pediatric Mental Health Care Disparities**

Study Main Author	Study Design	Study Period	Study Population United States	Main Effects Measured (All With Sociodemographics)	Results
Bethell et al (2011)[56]	2° cross sectional analysis NCSH telephone survey	2007-2008	91,642 0- to 17-year old	Insurance coverage, minimal quality of care index, access to medical home, BMI, 20 chronic medical or mental conditions	State of residence, family income level, and race or ethnicity, have a major role in whether children lack consistent insurance coverage or have adequate mental health coverage
Coker et al (2009)[57]	2° analysis Healthy Passages survey cohort	2004-2006	5147 fifth graders (and parents) from metropolitan areas	Mental health care utilization, child mental health symptoms, parental mental health symptoms, social resources and well-being	There are significant disparities in mental health care utilization for African American children which cannot be completely explained by racial/ethnic differences in parental social factors, family sociodemographics, or child mental health. Hispanic children did not have a disparity in utilization when compared with white children
Cummings et al[58]	2° cross sectional analysis of Add Health survey	1994-1995	7th-11th graders	Received counseling in a clinic or school, symptoms of depression, substance use, delinquency score	Minority students are less likely to receive mental health counseling in a community clinic when compared to white adolescents while no differences were found in schools
Flores and Tomany-Korman[59]	2° cross sectional, NSCH telephone survey	2003-2004	102,353 0- to 17-year old	Access and use of medical and dental care, medical and oral health status	Less than 10% of racial/ethnic groups other than non-Latino white had received mental healthcare in the past 12 months. Native Americans had highest disparities
Husky et al[60]	2° cross sectional analysis in-person interviews	2001-2004	13-14 year old and parent; nationally representative sample	Service use for mental health "problems," suicidal ideation/attempt	Rural low-income African Americans in public high schools participate more often in a school-based mental health-screening program than white students
Kapphahn et al[61]	Review of current state of affairs		Adolescents	Mental health care insurance coverage, cost of access, parity of mental health services	Adolescent mental health problems are prevalent and result in serious impairments when not treated. Funding early mental health care cost-efficient and humane
Le Cook et al[62]	Longitudinal 2° analysis of MEPS	2002-2007	30,171 5- to 21-year old	Need for mental health care, use of mental health care, insurance status	Disparities in mental health care for African American and Latino populations continue to persist over time
Sturm et al[63]	Cross sectional 2° analysis of NSAF	1997 1999	45,247 6- to 17-year old	Use of mental health services, need for mental health care, unmet need	Mental health care disparities are determined by state of residence. The majority of states have a higher need for mental health services than utilization rates

Add Health, National Longitudinal Survey of Adolescent Health; MEPS, Medical Expenditure Panel Survey; NSAF, National Survey of America's Families; NSCH, National Survey of Children's Health.

manner in which school-based and safety net mental health providers are often considered out-of-network providers by managed care.[62]

School-Based Health Center Mental Health Services

In the conceptual model, SBHCs are presented as one plausible intervention to address childhood trauma, mental health, and poor academic achievement. It is important to note decreasing exposure to trauma and treating children exposed to childhood trauma require multiple types of structural interventions and national cultural changes. The SBHC is one structural intervention that offers place-based health care that provides a one-stop source of care to patients with or without insurance. Table 4 summarizes the studies that review access, utilization, quality, and funding of SBHC mental health care to help determine if this model of care could contribute to decreased pediatric mental health care disparities. It also includes studies that review the impact SBHC mental health service use has on academic achievement.

Access, Utilization, Quality, and Funding of SBHC Mental Health Services

Several studies have found SBHCs increase access and utilization of mental health care.[16,17,19,20,64,65] Yet, disparities among racial/ethnic minority groups continue to be observed even when SBHCs offer mental health care.[64,66] Black and Hispanic students are less likely to have been screened or once screened, diagnosed with depression and Asian students are less likely to have used SBHC mental health services.[64,66]

Two studies reviewed quality of SBHC health and mental health care. One longitudinal study evaluated mental health care quality by utilizing psychosocial health-related quality of life measures (HRQOL) to determine if any impact was documented on adolescent functioning status with use of mental health care service.[16] The improved HRQOL scores were not statistically significant, but the authors posited they may have been clinically significant.[16] The study's low rate of return of surveys may have contributed to the authors' inability to document a significant difference. Another study employed mental health provider reports of clinical improvement and client satisfaction with services.[21] Providers reported significant improvements in student symptoms for a range of mental health disorders.[21] Client satisfaction rates were generally high.[21] The authors found that 1 in 10 students were not receiving needed mental health services, though this was deemed an improvement compared with national statistics of 1 in 3 students not receiving mental health services.[21] It appears the SBHC improves access and utilization, but it does not guarantee that all students will receive appropriate mental health services.

Two studies reviewed financing of SBHCs. One surveyed Oregon SBHCs and found the type of sponsoring agency largely determined funding.[67] Non-Federally Qualified Health Center SBHCs are more dependent on state funding in the form of grants, while SBHCs sponsored by Federally Qualified Health Centers rely more on billing insurance programs.[67] Yet, because SBHCs typically provide services that are not billable, a large number of SBHCs are not financially sustainable without government supplemental support.[67] Another study reviewed state policies that impact financing of SBHCs, but did not differentiate between funding for medical or mental health services.[68] The 19 states that directly funded SBHCs had specific funding mechanism policies, typically competitive grants, that were not guaranteed and subject to budget cuts.[69] Eight states had policies that mandated mental health quality assessments for SBHCs.[68]

School-Based Health Center Use and Impact on Academic Achievement

Two studies examined SBHC use and academic achievement. Kerns et al[41] and Walker et al[39] both used a retrospective longitudinal cohort design to examine urban low-income adolescent high school students' use of SBHCs with a master's prepared mental health counselor on staff. Walker et al[39] utilized attendance and GPA to measure academic achievement, while Kerns et al[41] used the rate of high school dropout. Students who used SBHC medical services had improved attendance rates, while students who used SBHC mental health services had improved GPA.[39] Students who had minimal or moderate use of a SBHC had lower dropout rates compared with students who did not use the SBHC, while students who used the SBHC often dropped out in similar rates to students who did not use the SBHC.[41] Nearly half (41%) of the visits among students considered ''high'' clinic users were for mental health reasons, while a quarter (24%) of ''moderate'' clinic users used mental health services, and 14% of all visits by ''low'' users were for mental health.[41] This implies that high clinic users have greater mental health needs and are therefore at greater risk for dropout.

DISCUSSION

This review of literature consistently documented the role that chronic childhood trauma, including exposure to violence in childhood, predicts poor academic outcomes. The relationship between trauma and negative academic performance was found to be mediated by mental health disorders. The mental health disorders that had the greatest impact on academic achievement were PTSD, depression, and

Table 4. **Studies of School-Based Health Centers (SBHCs) Mental Health Services**

Study-Author	Study Design	Study Period	Study Population (United States)	Main Effects Measured (All Include Sociodemographics)	Results
Anyon et al[64]	2° cross sectional analysis of YRBSS	2007	1755 urban 9th-12th graders	Health risks, use of SBHC, race	SBHCs increase access/utilization of services for at risk minority youth except for Asian students. Older students who were sexually active, had depressive symptoms, or used substances more likely to use SBHC
Gibson et al[65]	Cross sectional survey	2009	2076 urban 9th-12th graders	Access to, quality of care, and willingness to use SBHC	SBHCs increase access and utilization of care for 10th-12th graders
Guo et al[16]	Longitudinal time-series repeated measures	1997-2003	School-age students in metropolitan schools with Medicaid or SCHIP	Students who used mental health services before and after SBHC opened, total annual cost and reimbursement per student, psycho-social physical HRQOL score	SBHCs increase student access to mental health services in both urban and rural school settings. SBHCs reduce Medicaid costs per student and may have clinical improvements in psychosocial function
Juszczak et al[17]	Retrospective cohort design	1989-1993	451 urban highs school students	Student medical chart review - Group 1 at school with a SBHC but did not use it; Group 2 school did not have SBHC; Group 3 at a school with a SBHC and used SBHC	Students were 21 times more likely to initiate a mental health visit at a SBHC compared with community clinic. SBHCs increase access and utilization of health and mental health services in adolescents
Nystrom and Prata[67]	Survey, cost analysis, case study	2006-2007	20 SBHC systems in Oregon	Startup costs, annual operations costs, revenues	Type of sponsorship impacts source of revenue. Non-FQHC SBHCs rely on state funding while FQHC SBHCs rely on billing insurance
Schlitt et al[68]	Mailed survey	2004-2005	All state public health departments	Number of SBHCs, amount of funding and state criteria for funding distribution, types of technical assistance and performance data collection, Medicaid/SCHIP policies	States continue to increase SBHC initiatives and state-level leadership promotes the expansion of the SBHC model of care. Less than half the states in 2004 had set SBHC policies and funding not reliable
Sleiman-pour et al[19]	SBHC encounter form, pre-post client survey, focus group	2006-2009	12 SBHCs in California; 7410 clients, 286 surveys, 12 focus groups	Provider reported clinical data (service use, referrals, impact on health outcomes), pre-post client survey (sources of care, impact on health, satisfaction), focus groups	1 in 10 SBHC clients did not get needed mental health services from any source of care. With national averages of 1 in 3 students not receiving mental health services, the SBHC appears to improve access
Thomas et al[66]	Analysis of self-report survey	2008	1694 9th-12th graders, Texas school with SBHC	Depressive symptoms, gender, race	Black and Hispanic students less likely to have been screened or diagnosed with depression at SBHCs compared to white student
Wade et al[20]	Analysis SBHC medical encounter data	2000-2003	13,046 rural and urban K-8 students at schools with SBHCs	Enrollment into SBHC, utilization of SBHC, referral sources	SBHCs improve access and utilization of health and mental health care services in children, especially those of low SES or minority race
Kerns et al[41]	Longitudinal retrospective cohort	2005-2009	3334 urban ninth graders	Average monthly use of SBHC, dropout status	Strong inverse relationship between SBHC use and dropout for students using SBHCs except among the 10% most frequent high-risk users
Walker et al[39]	Retrospective analysis of SBHC database	2005-2008	2306 ninth graders in Seattle school district	Compare GPA/attendance in students who began use of SBHC first semester of high school to those who did not ever use SBHC	Students who utilize SBHCs for medical services have improved attendance while students who utilize SBHCs for mental health services have improved academics

GPA, grade point average; K, kindergarten; YRBSS, Youth Risk Behavior Surveillance System.

anxiety. Although not formally *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-V) disorders, children and adolescents with aggressive behavior or who had problems with attention deficit also had poorer academic achievement. These findings point to the importance of preventing childhood adverse events from occurring in the first place as a strategy for improving academic performance.

Studies continue to reveal how disparities in access, utilization, quality, and financing of pediatric mental health care are widespread in the US health care system. These factors were measured by use of services, type of clinics used, state of residence, health insurance, family sociodemographics, and lack of parity between mental and physical health. The studies reviewed populations prior to the implementation of the Affordable Care Act and, therefore, did not include analysis of its mandated parity of physical and mental health services. Both structural elements and cultural attitudes determined access and utilization of mental health services. Previous research has found disparities among all racial and ethnic groups when compared with white children and adolescents. Certain racial and ethnic groups were found to have consistently less access and utilization of mental health services when compared with non-Latino whites. For the majority of studies, income was the greatest predictor of mental health care use, with those children and adolescents in lower income households having less access to or use of mental health services. It is not possible from these studies to ascertain what other barriers may have existed, such as a lack of mental health providers representing the same ethnic/racial groupings of students or cultural factors including mental health stigma, that may have prevented some students from accessing care, even if it was available.

Several studies have found that SBHCs that incorporate mental health services increase access to and use of mental health services. However, not all populations benefit to the same degree. One study indicated mental health services may influence academic performance. Disparities in screening for mental health disorders persistently remain in SBHCs, in spite of co-location of services and elimination of traditional barriers to care. SBHCs are burdened by the lack of sustainable funding policies by state and federal health agencies to support both physical and mental health services. Federal policy that provides financing to SBHCs may be helpful in alleviating geographic and other types of health care delivery disparities currently reflected across the pediatric mental health care system.

Limitations and Gaps in the Research

This literature review may be limited by the search terminology used to find relevant studies and the criteria used for the inclusion or exclusion of studies. Although this was not a systematic review, it was an extensive review of the literature based on hypotheses generated through the conceptual model and, thus, it included a number of studies reflecting various levels of rigor.

There were also limitations in the selected studies thereby rendering an inconclusive judgment regarding the impact of SBHCs on decreasing the impact of trauma, health disparities and improving academic outcomes. Given the lack of studies that did not adopt a randomized or other rigorous research designs, we note where additional research is needed.

The literature regarding chronic childhood trauma's impact on academic performance as mediated by mental health disorders is relatively recent and has multiple gaps. The majority of studies have used a cross-sectional methodology. Longitudinal designs are urgently needed. The majority of studies are of urban populations; additional studies in rural and suburban populations are recommended. Another limitation is the lack of standardized measures across studies to capture health care process and outcome measures, as well as standardized ways to measure academic achievement. Another limitation is the lack of specific studies that further identify specific subpopulations, for example, inclusion of LGBTQ status as part of the demographic data collected across studies. Gaps also remain in pediatric mental health care with more studies needed that describe quality of care, health outcomes, effectiveness, and financing.

Studies regarding SBHC mental health service use have been conducted primarily with urban high school populations; thus, additional studies are needed in rural and suburban schools and in elementary and middle schools. This may be challenging because there are fewer SBHCs located in these settings. With only one study examining SBHC mental health service use and impact on academic standardized measures in a specific adolescent population in public schools in Seattle, it would be valuable to conduct similar research in other settings with the same age group, as well as elementary and middle school samples. Studies that measure students' exposure to chronic childhood trauma, their current mental health status, and sources of mental health care use (SBHC, community clinic, private office, and/or no care) with corresponding academic performance over time would be useful in answering the question of how well SBHCs or other systems of care can address the mental health needs of students, including those exposed to chronic trauma.

Conclusions

Chronic childhood trauma has a significant negative impact on academic performance, which is mediated by mental health disorders. Disparities in access,

utilization, quality, and funding of pediatric mental health care are prevalent in the United States. Children and adolescents exposed to trauma are more likely to perform poorly in school, have diminished educational and employment opportunities, and be at increased risk for chronic medical and mental health conditions, and early death.

SBHCs that incorporate mental health services have some demonstrated evidence of their ability to reduce, though not eradicate, the disparities currently found in our mental health care system. Additional studies are needed to ascertain if findings are replicable in different racial/ethnic groups, age groups, and geographic areas. Students who used the clinic most frequently had similar outcomes to those who did not use the SBHC.[41] Further research is needed to study the characteristics of both groups of students to better understand how non-users differed from those using SBHCs more frequently. The implication for policy is that the prevention of chronic childhood trauma is an ideal goal to assure health equity and mental well-being. If primary prevention of exposure to chronic childhood trauma is not feasible, then high quality, accessible, and culturally responsive mental health screening and treatment services are urgently needed for children and adolescents, specifically within school settings.

IMPLICATIONS FOR SCHOOL HEALTH

Creation of a school health team to assess student exposure to chronic childhood trauma and associated mental health needs may be a useful strategy for schools. The school health team can raise awareness among students, families, and teachers of how prevalent the exposure to childhood trauma is and how it increases the risk for both mental health disorders and poor academic achievement. Instituting a school health team focused on trauma may normalize mental health issues and foster planning to bring trauma-informed care onto campus. The school health team can approach local public health departments, community health centers, mental health providers, or hospitals to discuss feasible options for providing services on campus. The establishment of a SBHC is ideal for it offers comprehensive primary care, often by a team of multidisciplinary providers, who can screen and treat for exposure to chronic childhood trauma and mental health disorders.

Human Subjects Approval Statement

This article is a literature review and was exempt from human subjects review.

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