

A BIBLIOGRAPHY OF SOURCES

MEASURING THE IMPACT OF
SCHOOL-BASED HEALTH CENTERS ON
STUDENT HEALTH AND ACADEMIC ACHIEVEMENT

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COLORADO ASSOCIATION FOR
SCHOOL-BASED HEALTH CARE

A Bibliography of Sources Measuring the Impact of School-Based Health Centers on Student Health and Academic Achievement

Introduction

Healthy children perform better in school and experience reduced absenteeism and higher graduation rates. For those children and adolescents without access to primary and preventive health care, school-based health centers (SBHCs) provide a vital health care safety net and the opportunity to stay healthy and in school. Numerous studies have shown the connection between good health and academic achievement. The Colorado Association for School-Based Health Care (CASBHC) often receives requests for “proof” that school-based health centers are improving academic achievement, attendance, and graduation rates, while enhancing health and economic outcomes.

There are relatively few studies devoted exclusively to school-based health centers, but numerous studies have focused the impact of student health on various outcomes. The following bibliography serves as a compilation of articles devoted to describing the impact of pediatric health in a school setting through several categories:

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Student Health and Academic Performance and Achievement

Baxter, S.D.; Royer, J.A.; Hardin, J.W.; Guinn, C.H.; Devlin, C.M.

“The Relationship of School Absenteeism with Body Mass Index, Academic Achievement, and Socioeconomic Status Among Fourth-Grade Children.”

***Journal of School Health*; 81 (2011): 417-423.**

Purpose: This study analyzed data on fourth-grade children in South Carolina and looked at school absenteeism, body mass index, academic achievement, and socioeconomic status.

Method: Data from 920 fourth-grade students during two school years (2005 to 2007).

Results: The researchers found support for the inverse relationship between absenteeism and academic achievement. They did not find a significant link between absenteeism and BMI or absenteeism and socioeconomic status.

Kerns, S.E.U; Pullmann, M; Walker, S.C.; Lyon, A.R.; T.J., Cosgrove; E.J., Burns.

“Adolescent Use of School-Based Health Centers and High School Dropout.”

***Archives of Pediatrics and Adolescent Medicine*; 165 (2011): 7.**

Purpose: This study looked at the association between SBHC use and school dropout rates.

Method: A cohort of students studied from 2005 to 2009 with the variable of SBHC use.

Results: Low to moderate SBHC use was associated with a 33 percent reduction in dropout compared to non-SBHC users. The association was greatest for students at high risk of dropping out.

Centers for Disease Control and Prevention.

“Healthy Youth! Student Health and Academic Achievement.”

Accessed online 6/3/2011:

www.cdc.gov/healthyyouth/health_and_academics/index.htm

Purpose: This series of fact sheets examined the links between academic performance and alcohol use, tobacco use, physical inactivity, and sexual behaviors.

Method: The CDC Youth Risk Behavior Surveillance System looks at behaviors that impact death, disability, and social problems in youth in the United States.

Results: Physical activity is associated with improved academic performance. A student who feels connected to school and believes that the other students and adults care about his/her learning and well being engages in healthier behaviors. School health programs were shown to increase this connection for students. The fact sheets, based on scientific reviews, showed evidence that school health programs can have a positive impact on educational outcomes, as well as health-risk behaviors and health outcomes.

Walker, S.C.; Kerns, S.E.U.; Lyon, A.R.; Bruns, E.J.; Cosgrove, T.J.
“Impact of School-Based Health Center Use on Academic Outcomes.”
Journal of Adolescent Health; 46 (2010): 251-257.

Purpose: This study examined the effects of School-Based Health Center (SBHC) use on academic outcomes for high school students to determine if SBHC medical and mental health service use differentially impacted academic outcomes.

Method: The researchers followed 2,306 ninth grade SBHC users and nonusers over five semesters from the fall 2005 to the fall of 2007.

Results: A significant increase in school attendance for SBHC medical users compared to nonusers and a grade point increase over time for mental health users when compared to nonusers. Overall, the SBHC was associated with academic improvements over time.

Sigfusdottir, I.D.; Kristjansson, A.L.; Allegrante, J.P.
“Health Behaviour and Academic Achievement in Icelandic School Children.”
Health Education Research; 22 (2007): 70-80.

Purpose: This study sought to determine the impact of BMI, diet, and physical activity on academic achievement.

Method: A cross-sectional study of approximately 6,000 Icelandic students.

Results: BMI, diet, and physical activity explained nearly a quarter of the variance in academic achievement. Researchers noted variance increases of over 25 percent when depressed mood and self esteem were added to the model.

Taras, H.; Potts-Datema, W.
“Obesity and Student Performance at School.”
Journal of School Health; 75 (2005): 291-5.

Purpose: This report of peer-reviewed journal articles published between 1994 and 2004 looked at the impact of weight on student performance with variables such as attendance, achievement, and cognitive ability.

Method: Articles looking at children aged five to 18 years. Ten articles were used.

Results: All ten articles linked poor academic performance to obesity. Though not shown to be a causal factor, obesity seemed to be a predictor of a low GPA, fewer years of education, placement in special education or remedial classes, and increased likelihood of grade retention.

Peterson Geierstanger, S; Amaral, G; Mansour, M; Walters, S.R.
“School-Based Health Centers and Academic Performance: Research, Challenges, and Recommendations.”
Journal of School Health; 49 (2004): 9.

Purpose: This literature review focused on the methods, findings, and limitations of studies looking at the impact of SBHCs on academic performance.

Method: The review was conducted in 2003 to examine the current research available at that time.

Results: Six of the seven studies found small associations between at least one academic indicator and SBHCs. The research reviewed suggests that SBHCs can play a role in creating a better learning environment, but that more needs to be done to develop specific and proven links between SBHCs and academic performance.

Bureau of Primary Health Care.
“School-Based Clinics that Work.”
U.S. Department of Health and Human Services, Health Resources and Services Administration; 1994.

Purpose: This report looked at the characteristics of successful SBHCs and the impact such clinics had.

Method: Six SBHCs were selected and the researchers interviewed staff members and student users, in addition to collecting data services, student demographics, financing, and other performance drivers.

Results: The research reported that the SCBHCs improved school attendance and reduced drop-out rates. Several of the SBHCs also reported a decline in teen pregnancy rates.

McCord, M.T.; Klein, J.D.; Foy, J.M.; Fothergill, K.
“School-Based Clinic Use and School Performance.”
Journal of Adolescent Health; 14 (1993): 91-98.

Purpose: This study looked at the impact of SBHC use on absenteeism, suspension, grade advancement, and graduation.

Method: Researchers followed 322 students in a single alternative high school.

Results: The overall school attendance rate was 56 percent, suspension rate 24 percent, and 26 percent advanced to the next grade level or graduated. Actual SBHC users (49 percent of the student body) were just as likely to be absent or suspended, but more likely to advance through grade levels and to graduate (when compared to non-SBHC users).

Active Management of Asthma in a School Setting

Joseph, C; Saltzgaber, J; Havstad, L; Johnson, C; Johnson, D; Peterson, E; Alexander, G; Couper, M; Ownby, D.

“Comparison of Early-,Late-, and Non-Participants in a School-Based Asthma Management Program for Urban High School Students.”

***TRIALS*; 12 (2011): 1-7.**

Purpose: This study compared randomized controlled trials of participants and non-participants in a school-based asthma management program focused on urban teens and their recruitment into an asthma management program.

Method: Data analyzed from 1668 teens eligible for the randomized controlled trials. Of that group, 386 enrolled early and 36 enrolled late, leaving 1246 non-participants.

Results: Recruitment messages attracted youth with moderate-to-severe asthma. Participants tended to be younger, more likely to be diagnosed, and more likely to use asthma medication. Extending enrollment was costly and resulted in less motivated and compliant patients.

Bruzzese, J.M.; Sheares, B.J.; Vincent, E.J.; Du, Y.L.; Sadeghi, H; Levison, M.J.; Mellins, R.B.; Evans, D.

“Effects of a School-Based Intervention for Urban Adolescents with Asthma Controlled Trial.”
***American Journal of Respiratory and Critical Care Medicine*; 12 (2011): 998-1006.**

Purpose: This study tested the efficacy of Asthma Self-Management for Adolescents (ASMA), a school-based intervention approach for teens and providers.

Method: Researchers looked at data from 345 primarily African American and Latino high school students reporting asthma diagnosis, symptoms, and asthma medication use in the last 12 months. The school-based intervention lasted 8 weeks and the students were followed for 12 months.

Results: The Asthma Self-Management for Adolescents (ASMA) school-based intervention improved asthma self-management and reduced asthma morbidity and urgent health care use in low-income urban minority adolescents.

Bollinger, M.E.; Mophew, T; Mullins, C.D.

“The Breathmobile Program: A Good Investment for Underserved Children with Asthma.”
***Annals of Allergy Asthma & Immunology*; 106, vol.2 (2011): 174-181.**

Purpose: The Breathmobile is a mobile asthma clinic working to provide free care to underserved children. Researchers wanted to examine the clinical impact and cost-effectiveness of the Breathmobile.

Method: Existing computerized data from Breathmobile patient visits in Baltimore from years 2002 to 2007 was analyzed. The data included 255 patients enrolled in the program for at least one year.

Results: The Breathmobile showed a significant improvement in symptom free days for patients and showed direct medical cost savings.

Guo, J.J.; Jang, R; Keller, K.N.; McCracken, A.L.; Pan, W; Cluxton, R.J.
“Impact of School-Based Health Centers on Children with Asthma.”
Journal of Adolescent Health; 37 (2005): 266-274.

Purpose: This study looked at the impact of school-based health centers on hospital and emergency room visits for children with asthma.

Method: Researchers took four school-based health center school districts and compared them to two school districts without centers in Ohio. From 1997 to 2003, the researchers tracked children with asthma and with at least two continuous years of enrollment and medical claims for asthma diagnosis and asthma medication.

Results: Hospitalization and emergency room visits for children with asthma decreased significantly with school-based health center use. The study estimated potential cost-savings for hospitalization at \$960 per child.

Tinkelman, D; Schwartz, A.
“School-Based Asthma Disease Management.”
Journal of Asthma (2004); 41, vol.4: 455-462

Purpose: The study sought to determine if a school-based asthma management program, when combined with conventional disease management, could reduce measures of asthma control, student absenteeism, and lost workdays for caregivers.

Method: Researchers studied elementary and middle school students from three urban elementary schools. All of the students had asthma.

Results: Missed school days and unscheduled doctor visits were reduced by two-thirds in the first six months. Caregivers’ perception of children’s activity level increased by 11 percent and symptoms decreased. The researchers concluded that a comprehensive, school-based

management program could successfully improve asthma and reduce absenteeism for children while reducing lost work time for caregivers.

Webber, M.P.; Carpiello, K.E.; Oruwariye, T.; Lo, Y.; Burton, W.B.; Appel, D.K.
“Burden of Asthma in Inner-City Elementary School children.”
***Archives of Pediatric and Adolescent Medicine*; 157 (2003): 125-129.**

Purpose: This study compared outcomes (including hospitalizations, emergency room visits, and school absenteeism) in elementary school children with and without access to a SBHC.

Method: Researchers looked at six elementary schools in the Bronx (four schools with and two without SBHCs). Nine hundred and forty nine students known to have asthma and who attended one of six elementary schools were tracked in this study.

Results: Emergency department use was not associated with SBHCs. However, the researchers found that the rate of hospitalization due to asthma was lower for children with access to an SBHC and students with asthma and without access to an SBHC missed more days of school. Access to an SBHC was associated with a reduction in the rate of hospitalization and a gain of three days of school for children with asthma.

Lurie, N; Bauer, E.J.; Brady, C.
“Asthma Outcomes at an Inner-City School-Based Health Center.”
***Journal of School Health*; 71, vol.1 (2001): 9-16.**

Purpose: This study measured outcomes after the initiation of an inner-city elementary school school-based health center with a focus on asthma detection and treatment.

Method: The elementary school, located in Minneapolis, offered a cohort of children to follow before and after intervention.

Results: Hospitalization rates for the cohort decreased while the use of inhalers and asthma care plans improved. No change occurred in absenteeism but parents reported the child’s asthma was less disruptive to family plans.

Diette, G.B.; Markson, L; Skinner, E.A.; Nguyen, T.T.H.; Algatt-Bergstrom, P; Wu, A.W.
“Nocturnal Asthma in Children Affects School Attendance, School Performance, and Parents’ Work Attendance.”
***Archives of Pediatric and Adolescent Medicine*; 154, vol.9 (2000): 923-928.**

Purpose: This study sought to determine if a link exists between nocturnal awakenings from asthma and school absenteeism and performance (in children) and work absenteeism (in parents).

Method: A cross sectional survey used from the years 1997 through 1998 at three managed care organizations. The researchers surveyed 438 children aged five to 17 years.

Results: Nocturnal asthma awakenings in children resulted in missed school days and impacted student performance. Such awakenings also showed an impact on work attendance by parents.

Behavioral Health Services in a School Setting

Brown, M.B.; Bolen, L.M.

“The School-Based Health Center as a Resource for Prevention and Health Promotion.”
Psychology in the Schools; 45, vol.1 (2008):28-38.

Purpose: This article described the growing role of school-based health centers as an opportunity for school psychologists.

Method: The authors review previous research on health outcomes and the mental health services provided to students through the SBHC.

Results: School psychologists should partner with the SBHC to broaden their impact on the larger student body.

Nabors, L.A.; Prodent, C.A.

“Evaluation of Outcomes for Adolescents Receiving School-Based Mental Health Services.”
Social Policy, Research & Practice; 5, vol. 2 (2002): 105-112.

Purpose: This article explored the idea that youth in urban areas have less access to mental health services and face increased risk factors. As such, school mental health programs provide the ideal venue for providing such services.

Method: The researchers conducted a pilot study examining the change in adolescent reports of behavior and emotion after 12 months from those in a school-based program and those in the comparison group.

Results: Results showed minor improvements, but nothing clinically significant at the 12 and 18-month follow-ups.

Layne, C.M.; Pynoos, R.S; Saltzman, W.R.; Arslanagic, B; Black, M; Savjak, N; Popovic, T; Durakovic, E; Music, M; Campara, N; Djapo, N; Huston, R.

“Trauma/Grief-Focused Group Psychotherapy: School-Based Postwar Intervention with Traumatized Bosnian Adolescents.”
Group Dynamics: Theory, Research, and Practice; 5, vol. 4 (2001): 277-290.

Purpose: This study measured the ability of a school-based postwar program to help students cope with trauma and grief.

Method: Researchers studied 55 secondary school students participating in the program through 10 Bosnian schools.

Results: The students showed reduced psychological distress and positive associations between distress reduction and psychosocial adaptation.

Kaplan, D.W.; Brindis, C; Naylor, K.E.
“Elementary School-Based Health Center Use.”
Pediatrics; 101, vol.6 (1998): 12.

Purpose: This study looked at the physical and mental primary care utilization in a comprehensive elementary school SBHC for underserved Hispanic children.

Method: The researchers looked at 591 students using the SBHC.

Results: The 591 students made 2,443 visits. Most of the visits were medical provider visits (1638) and 33 percent were mental health provider visits (798). The visits fell into the following categories and percentages. Acute medical (31%), health maintenance (22%), depression (10%), non-Diagnostic and Statistical Manual of Mental Disorders-IV mental health diagnoses (8%), conflict disorder/emotional disturbance (8%), chronic medical (8%), academic/learning disorder (7%), anxiety disorder (3%), and other (4%).

Hoagwood, K; Erwin, H.E.
“Effectiveness of School-Based Mental Health Services for Children: A 10-Year Research Review.”
Journal of Child and Family Studies; 6, vol.4 (1997): 435-451.

Purpose: A literature review on school-based health centers and mental health services from 1985 to 1995.

Method: The review looked at 16 studies with random intervention, inclusion of a control group, and the use of standardized outcome measures.

Results: Three types of interventions had empirical evidence to support their effectiveness—cognitive behavioral therapy, social skills training, and teacher consultation.

Weist, M.D.; Paskewitz, D.A.; Warner, B.S.; Flaherty, L.T.
“Treatment Outcome of School-Based Mental Health Services for Urban Teenagers.”
Community Mental Health Journal; 32, vol.2 (1996):149-157.

Purpose: This study evaluated the treatment outcomes for high school students using a school-based health center for mental health treatment.

Method: The researchers compared students using a school-based health center in Baltimore to students receiving no mental health treatment.

Results: Depression scores for the treatment school-based health care group decreased. Students in this group also showed less significant decreases in anger and anxiety.

Anglin, T.M.; Naylor, K.E., Kaplan, D.W.

“Comprehensive School-Based Health Care: High School Students’ Use of Medical, Mental Health, and Substance Abuse Services.”

***Pediatrics*; 97, vol.3 (1996): 318-330.**

Purpose: This study looked at adolescent use of a school-based health clinic for medical care, mental health, and substance abuse counseling and compared SBHC services to utilization of the same services within a traditional medical setting.

Method: Researchers looked at data from three school-based health centers over a 4-year period.

Results: Over the course of the study, 3,818 students visited an SBHC. These students represented 42 percent of the student population. Adolescents using an SBHC experienced higher rates of medical, mental health, and substance abuse visits. The findings show that the SBHCs improved access to care.

Reproductive Health Services in a School Setting

Ethier, K.A.; Dittus, P.J.; DeRosa, C.J.; Chung, E.Q.; Martinez, E.; Kerndt, P.R.
“School-Based Health Center Access, Reproductive Health Care, and Contraceptive Use Among Sexually Experienced High School Students.”
Journal of Adolescent Health; 48 (2011): 562-565.

Purpose: This study compared reproductive health care, contraceptive use, and screening for STIs among sexually experienced adolescents with and without access to an SBHC.

Method: Twelve urban California high schools with high rates of pregnancy and STIs participated in the study. Six of the schools had SBHCs.

Results: Access to an SBHC did not influence the receipt of reproductive health care for males or females and did not influence contraceptive use for males. It did, however, influence female access to pregnancy prevention services and contraception use. Sexually active females with access to an SBHC were more likely to have used contraception and to have received specific care.

Juszczak, L.; Ammerman, A.
“Reaching Adolescent Males Through School-Based Health Centers.”
Journal of Adolescent Health; 48 (2011): 538-539.

Purpose: This editorial looked at the effectiveness of SBHCs in reaching adolescent males.

Method: The authors discussed studies, which gave evidence to support that adolescent males are more likely to use SBHCs than other health care settings.

Conclusions: SBHCs should create a male friendly space and consider hiring a male health educator to increase SBHC utilization for this normally difficult to reach segment of the population.

Ricketts, M.A. and Guernsey, B.P.
“School-Based Health Centers and the Decline in Black Fertility During the 1990s in Denver, Colorado.”
American Journal of Public Health; 96, vol. 9 (2006): 1588-1592.

Purpose: This study examined the changes in black adolescent fertility rates in high schools with SBHCs and compared them to rates in high schools without clinics.

Method: Researchers estimated fertility rates for high schools with and without SBHCs by looking at geocoded birth certificates and school enrollment data.

Conclusion: The rate of decline in areas with SBHCs was significantly greater (77%) compared to schools without SBHCs (56%). Researchers concluded that the rate of decline was likely a result of the strategies SBHCs used to identify, intervene, and follow-up on students engaging in high-risk sexual behaviors.

Barnet, B.; Arroyo, C.; Devoe, M.; Duggan, A.K.

“Reduced School Dropout Rates among Adolescent Mothers Receiving School-Based Prenatal Care.”

***Archives of Pediatric Medicine*; 158 (2004): 262-268.**

Purpose: This study examined the impact of SBHCs in reducing dropout rates for students accessing prenatal care.

Method: A retrospective cohort study was performed using school and medical records for 431 adolescents attending an alternative high school in Baltimore, MD.

Results: Absenteeism and dropout rates decreased for students who utilized prenatal care at an SBHC.

Coyne-Beasley, T.; Ford, C.A.; Waller, M.W.; Adimora, A.A.; Resnick, M.D.

“Sexually Active Students Willingness to Use School-Based Health Centers for Reproductive Services in North Carolina.”

***Ambulatory Pediatrics*; 3 (2003): 196-202.**

Purpose: This study asked if, in an area with limited access to reproductive health care, an SBHC was a valuable venue for students in need of such services.

Method: The authors conducted a cross-sectional survey of 949 sexually experienced students in two middle schools and five high schools.

Results: Most students (52%) reported inconsistent contraception use and 18 percent of females reported being pregnant. Seventy-five percent of the students had visited an SBHC and 58 percent said they would use the SBHC for more information about pregnancy and STI prevention. The authors concluded that the lack of reproductive health care services in the SBHC represents a missed opportunity to help adolescents who are at a higher risk of becoming pregnant or contracting an STI.

Wang, L.Y.; Burstein, G.R.; Cohen, D.A.

An Economic Evaluation of School-Based Sexually Transmitted Disease Screening Program. *Sexually Transmitted Diseases* (2002); 29: 737-745.

Purpose: This study evaluated the effectiveness of replacing non-school-based health screening with a school-based screening program.

Method: The authors developed a decision-analysis model to assess the expected costs and cases of pelvic inflammatory disease (PID) due to gonorrhea and Chlamydia with and without a screening program.

Results: The school-based screening program prevented 38 cases of PID at a savings of \$1,524 per case. The authors concluded the screening program was both cost effective and cost saving.

Gans, J.E.; Alexander, B; Chu, R; Elster, A.B.

“The Cost of Comprehensive Preventive Medical Services for Adolescents.” *Archive of Pediatric and Adolescent Medicine*; 149 (1995):1226-1234.

Purpose: This study addressed the need for clinical preventive services for 11 to 21-year-old persons and an estimate of the costs associated with those services under a fee for service model.

Method: The authors looked at national surveys to derive data on adolescent morbidities.

Conclusion: The researchers estimated that preventive interventions would have eliminated 15 percent of adolescent morbidities overall.

Bearss, N.; Santelli, J.; Papa, P.

“A Pilot Program of Contraceptive Continuation in Six School-Based Clinics.” *Journal of Adolescent Health*; 17(1995): 178-183.

Purpose: This study described the continuation of a pilot program offering reproductive health assessment and counseling in a Baltimore SCHC over a seven month period.

Method: The researchers studied 143 females enrolled in the SBHC program and collected data on contraceptive use, pregnancy and STI risk, sexual behavior, and parental support for contraceptive use.

Results: Oral contraceptive use and abstinence both increased over the course of the program, though condom used remained low at 30 percent. Program dropout was high and 10 percent of

the participants became pregnant while 35 percent were diagnosed with an SIT. Still, the authors concluded that monthly follow-ups would improve contraception use.

Santelli, J.; Alexander, M.; Farmer, M.; et al.

“Bringing Parents into School Clinics: Parent Attitudes toward School Clinics and Contraception.”

Journal of Adolescent Health; 13 (1992): 269-274.

Purpose: The article described the parental attitudes toward Baltimore SBHCs dispensing contraceptives.

Method: Prior to a policy change, which allowed SBHCs to dispense contraceptives, 2,622 parents were surveyed through telephone interviews.

Results: Parental responses were context specific: 63 percent endorsed and 27 percent opposed prescribing and dispensing. If an adolescent was already engaging in sex, 76 percent of parents supported and 14 percent opposed providing birth control pills or condoms. With parental permission, 93 percent supported contraception.

Lear, J.G.; Gleicher, H.B.; St. Germaine, A.; Porter, P.J.

“Reorganizing Health Care for Adolescents: The Experience of the School-Based Adolescent Health Care Program.”

Journal of Adolescent Health; 12 (1991): 450-558

Purpose: This paper focused on the progress of 23 school-based health centers in achieving goals surrounding adolescent health care needs.

Method: Twenty-three SBHCs given grants from the Robert Wood Johnson Foundation were studied through data provided through quarterly management reports.

Results: The authors focused on the challenges and successes the SBHCs experienced. Overall, the authors felt the SBHCs successfully engaged with the school in providing services to students.

Kirby, D; Waszak, C.; Ziegler, J.

“Six School-Based Clinics: Their Reproductive Health Services and Impact on Sexual Behavior.”

Family Planning Perspectives; 23 (1991): 6-16.

Purpose: This study looked at six SBHCs offering reproductive health services. All of the SBHCs were in low-income areas and served a predominately black population.

Method: Data collected from the six sites was compared to data from sites with similar demographics but without SBHCs.

Conclusion: The data indicated that the presence of the SBHCs neither hastened the onset of sexual activity among the adolescents nor did using the centers increase the frequency of sexual activity. In addition, contraceptive availability by itself did not significantly increase contraceptive use by students.

Galavotti, C.; Lovick, S.

“School-Based Clinic Use and Other Factors Affecting Adolescent Contraceptive Behavior.”
Journal of Adolescent Health Care; 10 (1989): 506-512.

Purpose: This article reported on a survey of SBHC usage, risk-taking behaviors, contraceptive usage, and prevention behaviors taken by students.

Method: The authors looked at 260 adolescents in an inner-city Dallas high school.

Results: SBHC usage, increased number of welfare benefits per household, and older age at the first time of intercourse were significant predictors of frequent contraceptive use. The authors concluded that these results indicate social welfare programs may have some success in encouraging adolescents to consistently use contraception.

Dryfoos, J.G.

“School-Based Health Clinics: Three Years of Experience.”
Family Planning Perspectives; 20 (1988): 193-200.

Purpose: This study explored the role of sexual activity and contraceptive practice among teenagers with access to SBHCs.

Method: The author looked at other studies and research available at the time of publication.

Conclusion: The author found no study showing an increase in the rate of sexual activity by students who utilized SBHC programs and found instead that those students who were sexually active and used an SBHC were more likely to use contraceptives.

Active Management of Obesity in Schools

Kong, A.S.

“Using a Community-Based Participatory Process in Creating a School-Based Health Center Obesity Intervention for Multi-Ethnic Teens.”

***Journal of Adolescent Health*; 48, vol. 20 (2011): S54.**

Purpose: This paper looked at obesity in adolescents in Albuquerque, New Mexico to help create a toolkit and DVD aimed at helping SBHC clinicians.

Method: The author collected data through interviews with overweight teens and their parents. Content experts in nutrition, fitness, and adolescent medicine then identified key themes, which were discussed in a community advisory council. Collectively, the council developed the toolkit and DVD.

Results: The conclusion supported the development of partnerships in the creation of obesity prevention SBHC programs, but also supported more research on initiative outcomes.

Rafalson, L.; Eysaman, J.; Quattrin, T.

“Screening Obese Students for Acanthosis Nigricans and Other Diabetes Risk Factors in the Urban School-Based Health Center.”

***Clinical Pediatrics*; 50: (2011) 747-752.**

Purpose: This study determined the prevalence of acanthosis nigricans (AN) and other diabetes risk factors in urban school health clinics.

Method: From 2006 to 2009, nurse practitioners in school-based health centers screened students who had a BMI \geq 95th percentile and one additional risk factor.

Results: Acanthosis nigricans can be easily identified by trained health professionals in an SBHC. Checking for AN should become routine practice for those treating overweight youth and testing should be incorporated into SBHCs.

Rappaport, E.B; Daskalakis, C.; Andrel, J.

“Obesity and Other Predictors of Absenteeism in Philadelphia School Children.”

***Journal of School Health*; 81, vol. 6 (2011): 341-344.**

Purpose: This study looked at the relationship between overweight children and school absenteeism.

Method: Researchers analyzed 219,040 records, representing 165,056 students in grades one through 12, and looked at BMI and obesity status (as determined by CDC percentiles).

Results: Obesity was weakly linked with school absenteeism and the link was mostly seen in the most obese students.

Geier, A.B.; McLaughlin, J.; Kumanyika, S.; Shults, J.; Foster, G.; Womble, L.; Borradaile, K.; Nachmani, J.; Sherman, S.

“The Relationship Between Relative Weight and School Attendance Among Elementary School Children.”

***Obesity*; 15 (2007): 2157–61.**

Purpose: This study looked at the relationship between weight and school attendance.

Method: Researchers studied 1069 fourth through sixth grade students and looked at the relationship between weight and attendance while controlling for age, gender, race, and socioeconomic status over a one-year period.

Results: Overweight children were absent 20 percent more than their normal-weight peers. The authors concluded that BMI is as significant a predictor of absenteeism as age, gender, race, or socioeconomic status.

Taras, H.; Potts-Datema, W.

“Obesity and Student Performance at School.”

***Journal of School Health*; 75 (2005): 291-295.**

Purpose: This report of peer-reviewed articles focused the relationship between weight and student performance.

Method: The reviewed journal articles described children aged five to 18 during the years 1994 through 2004.

Results: All of the articles attributed poor academic performance to obesity. Though not shown to be a causal factor, obesity seemed to be a predictor of lowered years of education and grade point average, placement in special education or remedial classes, and an increased likelihood of grade retention.

Wang, L.Y.; Yang, Q.; Lowry, R.; Wechsler, H.

“Economic Analysis of a School-Based Obesity Prevention Program.”
***Obesity Research*; 11 (2003): 1313-1324.**

Purpose: This economic evaluation assessed an interdisciplinary weight management program called “Planet Health”.

Method: The authors looked at the cost-effectiveness of the model and the benefits to society.

Results: A small percentage of girls (1.9%) were affected and no boys were impacted. The researchers determined the cost per student per year at \$14.

Dental Care in a School Setting

Bertrand, E; Mallis, M; Minh Bui, N; Reinharz, D.

“Cost-Effectiveness Simulation of a Universal Publicly Funded Sealants Application Program.”
Journal of Public Health Dentistry; 71 (2010): 1.

Purpose: This study looked at pit and fissure sealants in a publicly funded school-based selective program in Quebec.

Method: A Markov model was developed using a virtual population of 8-year-old children monitored over 10 years. The incremental cost per child without decay was then computed.

Results: By implementing a school-based program of universal pit and fissure sealant application, access to preventive dental care was improved in a more cost-effective manner. In Quebec, this publically funded school-based program was more cost-effective than the publicly funded private practice, but the most cost-effective option varied depending on the incidence of decay and the proportion of children identified as being at high-risk for decay.

Albert, D.A.; McManus, J.M.; Mitchell, D.A.

“Models for Delivering School-Based Dental Care.”
Journal of School Health; 75, vol. 5 (2005): 157-161.

Purpose: This paper described models of oral health services in SBHCs.

Method: The researchers looked at SBHCs operated by Columbia University in New York City.

Results: The models served as successful ways to deliver oral health care services to an at-risk population. The authors discussed the aspects of what made each model successful.

Locker, D.; Frosina, C.; Murray, H.; et al.

“Identifying Children with Dental Care Needs: Evaluation of Targeted School-Based Dental Screening Program.”
Journal of Public Health Dentistry (2004) 64(2): 63-70.

Purpose: This study looked at the effectiveness of a targeted SBHC dental screening program in terms of the number of children with dental care needs it identified.

Method: The researchers looked at children in kindergarten, second grade, fourth grade, sixth grade, and eighth grade in schools in Ontario where universal screening was implemented.

Results: Overall, researchers identified 21 percent of the target population as in need of dental care. Of that group, 7.4 percent required urgent care. The program was most successful in identifying low-income children who needed oral health care.

Kim, S.; Lehman, A.M.; Siegal, M.D.; et al.

“Statistical Model for Assessing the Impact of Targeted, School-Based Dental Sealant Programs on Sealant Prevalence Among Third Graders in Ohio.”

***Journal of Public Health Dentistry*; 63, vol. 3(2003): 195-199.**

Purpose: This study assessed the impact of sealant programs in SBHCs.

Method: Researchers randomly selected 9,747 third graders in schools in Ohio to analyze the link between sealant presence and school sealant program participation, dental care payment method, sex, race, and school lunch program eligibility.

Results: Adjusting for race and income, the odds of having dental sealants increased for children with SBHC dental sealant programs.

Edelstein, B.L.

“Disparities in Oral Health and Access to Care: Findings of National Surveys.”

***Ambulatory Pediatrics*; 2, vol. 2 (2002): 141-147.**

Purpose: This article discussed the disparities in oral health care.

Method: The author looked at data from national surveys.

Results: Low-income children experienced the greatest amount of oral disease, but had the fewest overall dental visits. Poor oral health and lack of dental care were most evident in low-income preschool children who were twice as likely to have cavities when compared to higher income children of the same age.

Vaccinations in the School Setting

Daley, M.F.; Curtis, C.R.; Pyrzanowski, J.; Barrow, J.; Benton, K.; Abrams, L.; Federico, S.; Juszczak, L.

“Adolescent Immunization Delivery in School-Based Health Centers: A National Survey.”
Journal of Adolescent Health; 45 (2009): 445-452.

Purpose: This study described the results of a survey conducted to determine perceived barriers to adolescent vaccinations offered in SBHCs.

Method: Researchers used a randomized national survey of 521 SBHCs.

Results: Most of the SBHCs (84%) reported offering vaccines, 96 percent vaccinated students enrolled in Medicaid, and 98 percent vaccinated uninsured students. Only 39 percent of the SBHCs reported billing private insurance, 69 percent used an electronic database to track vaccinations, and 83 percent sent reminders to students or parents if immunizations were due. The biggest barrier the SBHCs faced was in billing private insurance. This barrier kept some SBHCs from offering vaccinations at all. The researchers concluded that SBHCs serve as good place for the low-income and uninsured students to gain access to vaccinations.

Davis, M.M.; King, J.C.; Moag, L.; Cummings, G.; Magder, L.S.

“Countywide School-Based Influenza Immunization: Direct and Indirect Impact on Student Absenteeism.”
Pediatrics; 122 (2008): 260-265.

Purpose: This study compared student absenteeism records from schools without vaccination programs to those with such programs.

Method: Researchers looked at records from two school districts in Maryland from 2001 to 2006.

Results: Counties with a school-based vaccination program experienced reduced absenteeism at the elementary and high school level during a flu outbreak. The researchers concluded that SBHCs serve as an efficient venue to deliver the vaccine.

Schimier, J.; Li, S.; King, J.C.; Nichol, K.; Mahadevia, P.J.

“Benefits and Costs of immunizing Children Against Influenza at School: An Economic Analysis Based on A Large-Cluster Controlled Clinical Trial.”

Health Affairs; 27 (2008): 96-104.

Purpose: This study examined the costs of a large, multistate school-based influenza immunization program.

Method: Researchers created a clustered control trial involving more than 15,000 school children. They compared flu-like symptoms for those children with a vaccination intervention to those without such an intervention.

Results: Children at the vaccination schools experienced a statistically significant reduction in flu-like symptoms.

King, J.C.; Stoddard, J.J.; Gaglani, M.J.; Moore, K.A.; Magder, L.; McClure, E.; Rubin, J.D.; Englund, J.A.; Neuzil, K.

“Effectiveness of School-Based Influenza Vaccine.”

New England Journal of Medicine; 355 (2006): 2523-2532.

Purpose: This study looked at 11 clusters of demographically similar schools and in four different states to determine if those schools offering flu vaccines saw children with fewer flu-like symptoms.

Method: Researchers studied schools participating in the vaccine program and compared them to schools not participating in the program.

Results: Children who participated in the vaccine program had significantly fewer flu-like symptoms.

Short, M.B.; Rupp, R.; Stanberry, L.R.; Rosenthal, S.L.

“Parental Acceptance of Adolescent Vaccines within School-Based Health Centers.”

Herpes; 12 (2005): 23-27.

Purpose: This article describes the results of a survey asking about the hypothetical availability of vaccines for genital herpes and meningococcal disease under differing circumstances.

Method: A survey of parents with children who had access to an SBHC.

Results: The majority of those surveyed felt that SBHCs delivered high quality care and supported SBHCs offering vaccines in general, though the majority felt that parental consent for any vaccines at the time of SBHC enrollment was important. In addition, parents with children receiving the hypothetical genital herpes vaccine in an SBHC supported the vaccine with and without their knowledge.

Finance and School-Based Health Care

Caffray, C.M.; Chatterji, P.

“Developing an Internet-Based Survey to Collect Program Cost Data.”

Evaluation and Program Planning; 32 (2009): 62-73.

Purpose: This manuscript described the development and testing of an internet-based survey designed to understand the costs of school-based health programs.

Method: The National Assembly on School-Based Health Care created the survey and gave it to SBHCs nationwide.

Results: The researchers felt that the internet-based survey was an efficient and practical way to collect data on SBHCs.

Silberberg, M.; Cantor, J.C.

Rutgers Center for State Health Policy: Institute for Health, Health Care Policy, and Aging Research.

“Creating Sustainable School-Based Health Centers: A Report on Clinic Financing” (2002).

Purpose: This report looked at the cost of sustaining SBHCs.

Method: Researchers conducted 13 key informant interviews with scholars, government officials, and program administrators in New York, Delaware, Connecticut, and Colorado.

Results: The results led to the following recommendations: pursue a diversified funding stream, promote clear product definition, assess and enhance clinic record keeping, consider the establishment of an SBHC state association, seek sponsors, and educate allies.

Student Health and Economic Benefits

Wade, T.J.; Guo, J.J.

“Linking Improvements in Health-Related Quality of Life to Reductions in Medicaid Costs Amount Students Who Use School-Based Health Centers.”

American Journal of Public Health; 100, vol. 9 (2010): 1611-1615.

Purpose: This study examined whether improvements in pediatric health-related quality of life (HRQOL) stemming from use of SBHCs resulted in lower Medicaid costs.

Method: The researchers analyzed data from 290 children in an SBHC in Cincinnati, Ohio from 2000 to 2003. The researchers then looked into self-reported HRQOL as a predictor for changes in Medicaid costs.

Results: Improvements in HRQOL translated into lower Medicaid costs and the researchers concluded that HRQOL could be used as an outcome for evaluating SBHCs.

Guo, J.; Wade, T.J.; Pan, W.; Keller, K.N.

“School-Based Health Centers: Cost-Benefit Analysis and Impact on Health Care Disparities.”

American Journal of Public Health; 100, vol. 9 (2010): 1617-1623.

Purpose: This study analyzed the impact of SBHCs on health care access disparities.

Method: The researchers used a quasi-experimental repeated-measures design and looked at quarterly total Medicaid reimbursement costs for 5056 students in SBHC and non-SBHC groups from 1997 to 2003.

Results: With SBHCs, the gap of lower health care costs for African Americans was closed. The researchers estimated that SBHCs could have saved Medicaid approximately \$35 per student per year. The overall conclusion: SBHCs benefit the Medicaid system and society and may close health disparity gaps.

Key, J.; Washington, E.C.; Hulse, T.C.

“Reduced Emergency Department Utilization Associated with School-Based Clinic Enrollment.”

Journal of Adolescent Health; 30 (2002): 273-278.

Purpose: This study evaluated the change in emergency department use before and after enrollment in an SBHC.

Method: A retrospective cohort study comparing 10 to 15 year-olds at a local emergency department.

Results: The emergency department visit rate decreased for both groups (those enrolled in an SBHC and those not enrolled in an SBHC). However, the decrease was greater for the SBHC sample (41 to 51%) versus 18 percent for students without access. Researchers concluded that the accessible, prevention-oriented care delivered by the SBHC decreased episodic emergency room utilization.

Young, T.; D'angelo, S.L.; Davis, J.

“Impact of a School-Based Health Center on Emergency Department Use by Elementary School Students.”

Journal of School Health; 71, vol. 5 (2001): 196-198.

Purpose: This study analyzed the impact of an SBHC on emergency department use.

Method: The researchers looked at students attending an elementary school in a low-income area. They compared data from the year before the SBHC opened to the year during implementation.

Results: Emergency department visits decreased significantly after the SBHC opened.

Adams, E.K.; Johnson, V.

“An Elementary School-Based Health Clinic: Can It Reduce Medicaid Costs?”

Pediatrics; 105 (2000): 780-788.

Purpose: This study looked at one specific SBHC at an elementary school in Atlanta, Georgia to determine if it reduced Georgia Medicaid costs from 1994 to 1996.

Method: Researchers looked at 1994 to 1996 claims for Medicaid-enrolled children aged four through 12 using the SBHC to those without access to an SBHC.

Results: By 1995, the students enrolled in the SBHC had significantly lower emergency visit expenses. They also had higher Early Periodic Screening Diagnosis and Treatment preventive care expenses. By 1996, the students enrolled in the SBHC had significantly lower inpatient, nonemergency department transportation, drug, and emergency department expenses. The researchers concluded that access to an SBHC can have a significant impact on a child's use of services and health care expenses. Further, the researchers conclude that because SBHCs serve primarily low-income children, the clinics are likely to result in savings for Medicaid.

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