



A Narrative Review on the Impact of School-Based Nursing on Adolescent Health Promotion and Public Health Outcomes

Hazzaa Bandar Hazzaa Alanazi⁽¹⁾, Emad Souleman Ebani, Haya Mohammed Alrugaib⁽²⁾, Alanoud Rodayen Eid Alharthi, Khawlah Khalid Al saloom⁽³⁾, Fattemah Maber Yahya Al-Ribhi⁽⁴⁾, Amani Raji Jaber AlRoyli⁽⁵⁾, Ali Mohammed Ali Al Sheban⁽⁶⁾, Aishah hassan Ali⁽⁷⁾, Reem yati Alrasheedi⁽⁸⁾, Reem Nasser Abdullah AlBishi, Maryam Bakheet S Alanazi⁽⁹⁾, Afnan Abdullah Almaliky⁽¹⁰⁾, Asma Yousef Khada Baksh⁽¹¹⁾, Nemah Ahmed Rajhi⁽¹²⁾

(1) King Saud Medical city, Ministry of Health, Saudi Arabia,

(2) Shubra Primary Health Care, Ministry of Health, Saudi Arabia,

(3) Alyamamah primary health care centre, Ministry of Health, Saudi Arabia,

(4) Imam abdulrahman alfaisal hospital Riyadh, Ministry of Health, Saudi Arabia,

(5) King Saoud University pharmacy, Saudi Arabia,

(6) Dental clinics complex south of Riyadh, Ministry of Health, Saudi Arabia,

(7) King Fahad Medical City, Ministry of Health, Saudi Arabia,

(8) Ministry Of Health, Saudi Arabia,

(9) Alnadwah primary health care, Riyadh, Ministry of Health, Saudi Arabia,

(10) Al Mursalat Primary Health Care, Ministry of Health, Saudi Arabia,

(11) School Health, Riyadh, Ministry of Health, Saudi Arabia,

(12) Al Hair Haelth Centre, Ministry of Health, Saudi Arabia

Abstract

Background: Adolescence is a critical developmental period characterized by significant physical, cognitive, and emotional changes, during which lifelong health behaviors are established. School-based health centers (SBHCs) and school nursing represent a vital public health strategy to deliver accessible, preventive, and acute care to this often-underserved population. With rising rates of adolescent mental health crises, chronic conditions, and health inequities, the role of the school nurse has evolved far beyond basic first aid.

Aim: This narrative review synthesizes the evidence on the impact of school-based nursing models on direct adolescent health promotion and broader public health outcomes, examining effectiveness, implementation challenges, and return on investment.

Methods: A systematic literature search was conducted across PubMed, CINAHL, ERIC, PsycINFO, and Scopus. Peer-reviewed studies, systematic reviews, and policy reports published between 2010-2023 were analyzed thematically to evaluate outcomes related to clinical care, health behaviors, academic performance, and community health.

Results: Evidence demonstrates that robust school nursing significantly improves immunization compliance, chronic disease management (e.g., asthma, diabetes), mental health screening and referral, and reproductive health access. Outcomes include reduced absenteeism, emergency department visits, and hospitalizations, alongside improvements in health literacy and self-management skills.

Conclusion: School-based nursing is a highly effective, multi-sectoral intervention for advancing adolescent and public health. Sustained investment, standardized outcome metrics, and integration with primary care and mental health systems are essential to maximize its population health impact.

Keywords: School Nursing, Adolescent Health, Public Health, School-Based Health Centers, Health Promotion

Introduction

Adolescence, spanning ages 10-19, is a pivotal period of biopsychosocial development that lays the foundation for lifelong health trajectories (Sawyer et al., 2018). It is a time marked by increasing autonomy, experimentation, and vulnerability to the emergence of mental health disorders, substance use, and the establishment of risky health behaviors (Patton et al., 2016).

Concurrently, the prevalence of chronic health conditions such as asthma, obesity, and type 1 diabetes among youth has risen, requiring sophisticated management within the context of daily life, including school (Perrin et al., 2014). Schools, by virtue of their near-universal reach, represent a uniquely powerful setting for delivering health promotion, preventive services, and acute care,

thereby acting as a de facto component of the public health infrastructure (Schwartz et al., 2023).

School-based nursing has evolved from its early 20th-century origins in infectious disease control to a comprehensive public health nursing specialty. The modern school nurse functions as a clinician, care coordinator, health educator, and public health sentinel (Maughan et al., 2018). Operating within School-Based Health Centers (SBHCs) or as a district-employed health services provider, nurses address a vast spectrum of needs: managing chronic conditions, administering immunizations, providing mental health first aid, offering reproductive health services, responding to injuries and emergencies, and connecting students and families to community resources (Arenson et al., 2019). This positioning allows them to mitigate health barriers to learning, a concept central to the Whole School, Whole Community, Whole Child (WSCC) model (CDC, 2019).

Despite its theoretical promise, the implementation and impact of school nursing are inconsistent, influenced by funding streams, state-level policies, staffing ratios, and competing academic priorities (Gratz et al., 2023). This narrative review synthesizes contemporary evidence (2010-2023) to critically examine the impact of school-based nursing on two interconnected levels: (1) direct adolescent health promotion outcomes, and (2) broader public health and community-level outcomes. It will analyze the effectiveness of various nursing models, identify key barriers to optimal implementation, and discuss the economic and societal return on investment, ultimately arguing for the reconceptualization of school nursing as an essential, rather than ancillary, component of both the education and healthcare systems.

The Evolving Role and Models of School-Based Nursing

The role of the school nurse has expanded dramatically in response to the increasing complexity of student health needs. Guided by the *Framework for 21st Century School Nursing Practice™* established by the National Association of School Nurses (NASN), practice is organized around five key principles: Care Coordination, Leadership, Quality Improvement, Community/Public Health, and Standards of Practice (NASN, 2016). This framework moves practice beyond reactive sick care to proactive population health management.

Operational models vary significantly, impacting scope and outcomes. The most common model employs district-hired registered nurses (RNs), who serve one or multiple schools, focusing on mandated health screenings, medication administration, individualized healthcare plan (IHP) development, and emergency response (Maughan et al., 2018). A more intensive model is the School-Based Health Center (SBHC), often staffed by an interdisciplinary team including an advanced practice

registered nurse (APRN), such as a nurse practitioner (NP) or clinical nurse specialist (CNS). SBHCs can provide a wider range of clinical services, including diagnosis, treatment, prescription authority, and mental health counseling, often billed to insurance (Arenson et al., 2019). A hybrid "community school" model integrates a school nurse with extensive community partnerships, focusing on social determinants of health like food insecurity, housing instability, and access to primary care (Knopf et al., 2016). The level of preparation also varies; while a Bachelor of Science in Nursing (BSN) is recommended, many states still employ nurses with diplomas or associate degrees, and the presence of an APRN markedly expands service capacity (Jameson et al., 2020). Figure 1 illustrates the school-based nursing model.

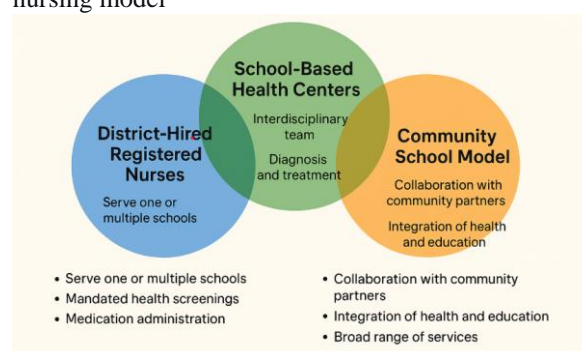


Figure 1: School-based nursing model
Impact on Direct Adolescent Health Promotion Outcomes

School-based nursing directly influences a wide array of individual adolescent health outcomes, serving as a critical access point for preventive and therapeutic services.

Chronic Disease Management

For students with chronic conditions, the school nurse is indispensable for daily management and crisis prevention. Robust evidence shows that school nurse-led asthma programs, including education, environmental assessment, and supervised medication administration, significantly improve asthma control, reduce symptoms, and decrease school absences (Bruzzese et al., 2009). For students with type 1 diabetes, consistent access to a school nurse for blood glucose monitoring, insulin administration, and hypoglycemia management is associated with better glycemic control, reduced diabetic ketoacidosis events, and lower rates of diabetes-related school absences (Drakopoulou et al., 2022). The nurse's role in developing and implementing IHPs and Emergency Care Plans ensures safe and inclusive participation in school activities.

Mental and Behavioral Health

The adolescent mental health crisis has thrust school nurses into the front line of early identification and intervention. While typically not therapists, nurses are skilled in mental health

screening (e.g., for depression, anxiety, suicide risk), providing immediate crisis intervention, and making appropriate referrals to school psychologists or community providers (Kaskoun & McCabe, 2021). Their consistent, non-stigmatizing presence makes them a trusted adult for students in distress. Studies link the presence of a full-time school nurse to improved identification of mental health concerns and better linkage to care (Bohnenkamp et al., 2015).

Reproductive Health and Prevention

School nurses play a vital role in sexual health education and service provision. In SBHCs with APRNs, services can include contraception counseling and provision, testing and treatment for sexually transmitted infections (STIs), and pregnancy testing (Xu et al., 2020). These services increase access for adolescents who may face geographic,

financial, or confidentiality barriers to community clinics. School-based immunization programs, often coordinated by school nurses, are highly effective at increasing vaccination rates for HPV, meningococcal disease, and influenza, thereby providing critical herd immunity (Perman et al., 2017).

Health Literacy and Self-Management

A fundamental, though less easily quantified, outcome is the development of health literacy. Through one-on-one interactions and classroom education, nurses teach students to understand their bodies, manage minor ailments, navigate the healthcare system, and make informed health decisions (Shackleton et al., 2016). This empowerment fosters lifelong self-efficacy and healthy behaviors (Table 1).

Table 1: Impact of School Nursing on Key Adolescent Health Outcomes

Health Domain	Key Nursing Interventions	Documented Outcomes
Chronic Disease (Asthma, Diabetes)	Development of IHPs; daily medication administration & monitoring; student & staff education; environmental assessments.	Improved symptom control; reduced rescue inhaler use; better glycemic control (HbA1c); decreased school absences & ED visits (Bruzzeze et al., 2009; Drakopoulou et al., 2022).
Mental & Behavioral Health	Mental health screening; crisis assessment & intervention; referral coordination; suicide risk assessment; stress management education.	Increased identification of at-risk students; improved linkage to specialty care; reduced behavioral disruptions; provision of a trusted, accessible resource (Bohnenkamp et al., 2015; Kaskoun & McCabe, 2021).
Preventive & Reproductive Health	Immunization compliance tracking & clinics; sexual health education; contraception & STI services (in SBHCs); pregnancy testing.	Increased HPV and flu vaccination rates; decreased rates of unprotected sex and STIs; improved access to confidential care (Xu et al., 2020; Perman et al., 2017).
Acute Care & Safety	Injury/illness assessment & first aid; emergency response (e.g., anaphylaxis, seizures); concussion management; communicable disease surveillance.	Reduced unnecessary ED referrals; appropriate emergency management; faster return-to-learn protocols; early detection of outbreaks (Maughan et al., 2018).

Impact on Public Health and Community-Level Outcomes

The benefits of school nursing extend beyond the individual student to generate significant public health and societal returns.

Reduction in Health Disparities

Schools are a prime venue for addressing health equity. School-based services are uniquely positioned to reach marginalized populations—including racial/ethnic minority youth, those from low-income families, and students in rural areas—who face significant barriers to traditional healthcare (Knopf et al., 2016). By providing free, accessible, and culturally competent care on-site, school nursing can mitigate disparities in access to preventive services, chronic disease management, and mental health care, effectively acting as a safety-net provider (Arenson et al., 2019).

Healthcare System Utilization and Cost-Benefit

School nursing provides a cost-effective diversion from higher-cost settings. By managing asthma attacks, diabetic episodes, and injuries at school, nurses prevent unnecessary visits to emergency departments and urgent care centers (Basurto-Dávila et al., 2017; Tran et al., 2016). A landmark economic analysis by Yoo and colleagues (2019) demonstrated that for every \$1 invested in school nursing, society gains \$2.20 in savings from medical costs and parental productivity losses averted. School-based immunization drives also provide a highly efficient public health service, achieving high coverage rates at lower per-dose administrative costs.

Educational Outcomes and Attendance

Health and learning are inextricably linked. School nurses directly support educational achievement by reducing health-related absenteeism. Effective management of chronic conditions, early

intervention for minor illnesses, and prompt response to mental health crises keep students in class and ready to learn (Baisch et al., 2011). Furthermore, by addressing issues like vision and hearing deficits through mandated screenings, nurses remove preventable barriers to academic success.

Public Health Surveillance and Emergency Preparedness

School nurses serve as sentinels for community health. They are often the first to detect patterns of illness that may indicate a local outbreak of influenza, norovirus, or other communicable diseases, enabling a timely public health response (Lopez et al., 2016). Their role in school emergency preparedness planning—from training staff in epinephrine administration to developing protocols for disasters—is critical for community resilience. Figure 2 illustrates the impact of school-based nursing on adolescent health promotion and public health outcomes.

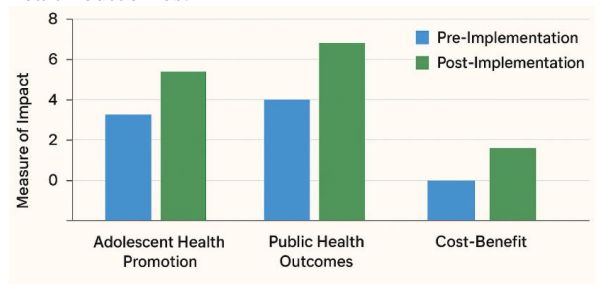


Figure 2: Impact of school-based nursing on adolescent health promotion and public health outcomes.

Barriers and Facilitators to Optimal Impact

The potential of school nursing is often constrained by systemic barriers. Inadequate and unstable funding is the most significant challenge. School nursing is frequently funded through discretionary education budgets, making it vulnerable to cuts. Medicaid reimbursement for school-based services is complex and varies by state, limiting financial sustainability (Lineberry & Ickes, 2015). High nurse-to-student ratios far exceed the NASN recommendation of 1:750 and severely compromise care quality. Nurses covering multiple

schools become largely reactive, unable to engage in population-level health promotion (Willgerodt et al., 2021; Davis et al., 2021). Role ambiguity and isolation are also issues; nurses may be perceived as outsiders by both educational and healthcare systems, and their clinical expertise may be underutilized by school administrators focused solely on academic metrics (Pasquini & Schultz-Jones, 2019).

Key facilitators for success include strong administrative and community support, integration into the academic mission via the WSCC model, effective use of health information technology for documentation and care coordination, and interprofessional collaboration with teachers, counselors, and community providers (NASN, 2016; Schwartz et al., 2023).

Future Directions and Policy Implications

To maximize the public health impact of school nursing, strategic advancements are necessary. Standardized outcome measurement is crucial; developing a core set of metrics related to health outcomes, educational impact, and cost savings will strengthen advocacy (Maughan et al., 2018; Tracey & Reid, 2023). Policy advocacy must focus on securing dedicated, stable funding streams, mandating reasonable nurse-to-student ratios, and expanding Medicaid reimbursement for school nursing services (Lineberry & Ickes, 2015). Educational advancement for the workforce, including support for obtaining the BSN and increasing the number of APRNs in schools, will enhance clinical capacity (Willgerodt et al., 2018; Schroeder et al., 2023).

Furthermore, technological integration, such as telehealth partnerships with pediatric specialists or remote monitoring for chronic conditions, can extend the nurse's reach, particularly in rural areas (Reising & Cygan, 2022). Finally, robust research, particularly rigorous cost-benefit analyses and longitudinal studies on the impact of specific nursing interventions on long-term health trajectories, is needed to solidify the evidence base for investment (Table 2).

Table 2: Barriers, Facilitators, and Policy Levers for School Nursing Impact

Domain	Key Barriers	Essential Facilitators	Policy & Practice Recommendations
Funding & Resources	Discretionary education funding, complex Medicaid billing, and high nurse-to-student ratios.	Dedicated health service funding; grant support (e.g., Title I, IV); community partnerships.	Advocate for state legislation for minimum nurse staffing ratios; simplify Medicaid reimbursement for school nursing services; and braid funding from education and health departments.
Practice & Integration	Role ambiguity, isolation from both education and health systems; reactive vs. proactive focus.	Adoption of the NASN Framework; inclusion in WSCC model teams; integrated data systems.	Clearly define the school nurse's role in district policy; include the nurse in academic leadership meetings; implement EHRs that interface with community providers.
Workforce	Variable educational	Tuition support for	Mandate BSN as entry-level

& Capacity	preparation, high burnout and turnover; limited APN presence.	BSN/APRN; strong state requirement; create loan forgiveness programs for school nurses; fund APN positions in high-need districts.
Evaluation & Evidence	Lack of standardized outcome metrics; difficulty attributing academic gains to health interventions.	Development of a national school nursing data set; partnership with university researchers. Fund implementation science research in school health; require districts to report key health outcome metrics (e.g., asthma-related absences).

Conclusion

School-based nursing is a powerful, multi-faceted intervention at the intersection of health and education. The evidence synthesized in this review demonstrates unequivocal positive impacts on individual adolescent health promotion—from managing chronic diseases to safeguarding mental health—and on broader public health outcomes, including health equity, healthcare cost containment, and academic achievement. The school nurse functions as a clinician, educator, advocate, and sentinel, providing an indispensable safety net for the nation's youth.

However, this potential is currently under-realized due to systemic underinvestment and fragmentation. Realizing the full promise of school nursing requires a paradigm shift: from viewing it as an optional student support service to recognizing it as an essential component of the public health infrastructure and a wise investment in future societal well-being. This necessitates committed policy action, sustainable funding, workforce development, and continued research. By strategically strengthening school-based nursing, we can foster a healthier, more equitable, and better-educated generation.

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