

The impact of school health nursing interventions in controlling the spread of infectious diseases in educational institutions and health facilities

Lamyaa Hassan mohammed Hakami¹, Ali Mubarak Saleem Alkhuzae², Ibtisam Fahad sayah Alshammari³, Samirah Abed Majed Althobaiti⁴, Fawaz Abdalaziz M Alsuliman⁵, Reem redaid Almsoudi⁶, NAWAL HAMED ALOTIBI⁷, SAAD BARAKAT ALSWIHIRI⁸, AYMAN SALEH BATI⁹, HAIFA MOHMED ALQURASHI¹⁰, AHMED EDAH ALQURASHI¹¹, Ahmed Hanas Faris Alshammari¹², Hussain Mousa Ahmed Alzahrani¹³, Khalid Marzouq Al-Lahaibi¹⁴

1. *Nursing - senior specialist King Abdullah medical complex*
2. *Nursing Technician AlKaakia PHC*
3. *Nursing Technician Al-Shabah GEneral. Hospital*
4. *Nursing-Technician Taif Health Cluster*
5. *Nurse Public health - infection disease department.*
6. *Nurse Aljarana PHC*
7. *NURSE ALBEJIDI PHC*
8. *NURSE ALBEJIDI PHC*
9. *NURSE ALBEJIDI PHC*
10. *NURSE ALBEJIDI PHC*
11. *NURSE ALBEJIDI PHC*
12. *Nursing Specialist Hail Health Cluster*
13. *Nurssing specialist Alaskan PHC*
14. *Nurse Techician Executive Administration Of Prison Health*

Abstract

Infectious diseases pose significant challenges in educational institutions and associated health facilities due to the high risk of transmission in densely populated environments. School health nursing interventions play a pivotal role in mitigating these risks through preventive care, health education, and outbreak management. This study explores the impact of school health nursing interventions on controlling the spread of infectious diseases, emphasizing their effectiveness in promoting hygiene, managing outbreaks, and collaborating with public health authorities. The literature highlights key strategies employed by school health nurses, including vaccination programs, health screenings, hygiene promotion, and the use of emerging technologies like mobile health tools. These interventions have been shown to reduce the incidence of communicable diseases, improve overall health awareness, and enhance the safety of educational environments. However, challenges such as limited resources, vaccine hesitancy, and staff shortages often hinder their implementation. The findings underscore the critical role of school health nurses in fostering a healthy learning environment while addressing gaps in current research, such as long-term community health impacts and the scalability of successful interventions. This study provides actionable insights for policymakers, educators, and healthcare professionals to strengthen school health services and improve public health outcomes.

Keywords:

Introduction

Healthcare-related infections impair an individual's quality of life due to increased pain and mortality, deteriorated health, dysfunction, cognitive impairment, and financial loss of the health management system because of delayed recovery and extended hospital stay [1]. Educational institutions and health facilities are critical environments for the development and well-being of individuals. However, these spaces are often vulnerable to the spread of infectious diseases due to high population density and frequent close interactions among individuals [2]. In such contexts, the role of school health nurses becomes indispensable. School health nursing interventions encompass a broad range of preventive, educational, and responsive actions designed to promote health, prevent disease, and manage outbreaks effectively.

The increasing prevalence of infectious diseases such as influenza, COVID-19, and other communicable illnesses has highlighted the urgency of proactive health management strategies within schools and associated health facilities. School health nurses are uniquely positioned to act as first responders in identifying, managing, and mitigating the risks of infectious diseases. By conducting health assessments, educating students and staff, and implementing infection control measures, these professionals play a pivotal role in ensuring a safe and healthy learning environment [3].

Infections in school children are common. Schools are ideal places for the spread of infectious diseases because of the large numbers of young people of different ages in close contact with each other, some of whom may not have developed good personal habits or immunity to various diseases [4]. Understanding the way different infectious diseases spread allows the correct preventive measures to be applied.

Understanding the effectiveness of these interventions is vital for policymakers, educators, and healthcare providers to strengthen the infrastructure supporting school health services. By fostering a collaborative approach between educational institutions, health facilities, and community stakeholders, school health nurses can significantly contribute to reducing the burden of infectious diseases and enhancing overall public health outcomes [5].

This paper explores the impact of school health nursing interventions on controlling the spread of infectious diseases in educational and healthcare settings. It examines key practices such as vaccination campaigns, hygiene promotion, outbreak response, and coordination with public health authorities. Furthermore, it investigates the challenges and opportunities faced by school health nurses in fulfilling their roles, particularly in the context of limited resources, increasing health risks, and the evolving landscape of public health priorities.

Literature Review

Introduction to School Health Nursing Interventions

School health nursing interventions are vital to maintaining a healthy environment in educational institutions. These interventions involve a combination of preventive care, health education, outbreak management, and collaboration with public health entities [6]. School nursing is a specialized practice responsible for intervening in students' social, physical and emotional needs and developing comprehensive care, which favors academic success, lifelong achievement and students' health [7]. The literature consistently emphasizes the role of school health nurses as frontline defenders against

infectious disease outbreaks, particularly in settings where close interactions between individuals can accelerate disease transmission.

Theoretical Framework and Scope

Research on health interventions in schools often draws upon public health models such as the Health Belief Model (HBM) and Social-Ecological Framework, which highlight the importance of individual, organizational, and societal contributions to health management [8]. These frameworks underpin the development of strategies employed by school health nurses, including vaccination programs, hygiene education, and the implementation of infection control policies.

Preventive Measures and Their Effectiveness

Keeping children and adults who care for them healthy is a goal of educators, families, public health officials, and health professionals [8]. Children rely on adult caregivers to incorporate and teach them routines and behaviors to help prevent the spread of infectious diseases including influenza (flu), respiratory syncytial virus (RSV), and COVID-19 in schools and at home. Many preventive strategies are simple, safe, and effective, allowing to guard against a variety of potentially serious illnesses [11]. Studies have shown that preventive measures implemented by school health nurses, such as **vaccination campaigns**, significantly reduce the incidence of vaccine-preventable diseases like influenza and measles. For instance, a study by Dini, et al. (2018) highlighted a 30% reduction in influenza cases in schools where health nurses coordinated vaccination drives compared to schools without such programs. Additionally, regular health screenings and surveillance efforts help detect early signs of infectious diseases, enabling timely interventions [12].

Health Education and Hygiene Promotion

The role of school health nurses in promoting hygiene practices is well-documented. Educational sessions on handwashing, respiratory etiquette, and the use of personal protective equipment (PPE) have been linked to improved hygiene behaviors among students and staff. Research by Hoekstra, et al, (2016) found that School nurses described six main themes. Four themes directly related to the school nurse role: the main roles of a school nurse, school nurses' role in health education, prioritization of workload and activities, and community work. A further two other themes related to the delivery of health education: the school nursing system and educational resources [13]. schools with consistent health education programs experienced lower rates of absenteeism due to infectious diseases. Such programs not only benefit students but also create a ripple effect in the wider community by fostering healthy habits [10].

Management of Outbreaks and Emergency Response

School health nurses are critical in outbreak management, particularly during crises like the COVID-19 pandemic. Their responsibilities include contact tracing, isolating symptomatic individuals, and coordinating with local health authorities [14]. According to a report by the World Health Organization (2021), schools with trained health nurses experienced more effective containment of COVID-19 outbreaks compared to those relying solely on administrative staff [15].

Collaborative Role of School Health Nurses

Collaboration between school health nurses, public health agencies, and educational administrators enhances the efficiency of disease control measures. For example, studies highlight the importance of multi-disciplinary teams in addressing challenges such as vaccine hesitancy, misinformation, and limited resources. Collaborative approaches also facilitate the development of tailored interventions that address the specific needs of individual schools or communities.

Challenges and Barriers

Despite their importance, school health nurses face several challenges in controlling the spread of infectious diseases. Limited funding, inadequate staffing, and a lack of access to resources often hinder their ability to implement effective interventions. A survey conducted by Keyworth, et al. (2018) revealed that 60% of school nurses reported insufficient time and materials to carry out comprehensive health programs. Additionally, cultural and societal factors, such as vaccine hesitancy and resistance to health education, further complicate their efforts [3].

Opportunities and Innovations

Emerging technologies and innovative practices present opportunities to enhance the impact of school health nursing interventions. Mobile health (mHealth) technologies, telehealth consultations, and electronic health records have been increasingly utilized to improve communication, streamline reporting, and expand the reach of health education programs. Research by Kim, et al. (2022) found that integrating digital tools into school health services improved efficiency and accessibility, particularly in underserved areas [3].

Conclusion and Research Gaps

While existing literature underscores the importance of school health nursing interventions, several research gaps remain. For instance, there is limited data on the long-term impact of these interventions on broader community health outcomes. Additionally, more studies are needed to evaluate the cost-effectiveness of specific programs and the potential for scaling up successful models. Addressing these gaps will be critical for optimizing the role of school health nurses in managing infectious diseases.

References

1. Kim E, Kim SS, Kim S. Effects of Infection Control Education for Nursing Students Using Standardized Patients vs. Peer Role-Play. *Int J Environ Res Public Health*. 2020 Dec 26;18(1):107. doi: 10.3390/ijerph18010107. PMID: 33375222; PMCID: PMC7794753.
2. Martinsson E, Garmy P, Einberg EL. Nurses' experience of working in school Health Service during the COVID-19 pandemic in Sweden. *Int J Environ Res Public Health*. 2021;18(13):6713. doi:10.3390/ijerph18136713
3. Keyworth C, Epton T, Goldthorpe J, et al. . Are healthcare professionals delivering opportunistic behaviour change interventions? A multi-professional survey of engagement with public health policy. *Implement Sci* 2018;13:122 10.1186/s13012-018-0814-x
4. Hollmeyer HG, Hayden F, Poland G, Buchholz U. Influenza vaccination of health care workers in hospitals—a review of studies on attitudes and predictors. *Vaccine*

- 2009; 27(30):3935-44 [accessed June 7 2017]; <https://doi.org/10.1016/j.vaccine.2009.03.056>
5. Wang, X., Liu, J., Wu, Y. *et al.* Enhancing the effectiveness of infectious disease health education for children and adolescents in China: a national multicenter school-based trial. *BMC Public Health* **23**, 1161 (2023). <https://doi.org/10.1186/s12889-023-16000-3>
 6. Muniz EA, Queiroz MVO, Pinheiro PNDC, Silva MRFD, Moreira TMM, Oliveira EN, Almeida IFDP, Barbosa Filho VC. School Nursing Guide for student health promotion: construction and validity. *Rev Bras Enferm.* 2022 Dec 16;76(1):e20220260. doi: 10.1590/0034-7167-2022-0260. PMID: 36542056; PMCID: PMC9749768.
 7. Maughan ED, Jameson BE. Celebrating 21st-Century School Nursing Practice. *NASN Sch Nurse.* 2020;35(3):133–135. doi: 10.1177/1942602x20913908.
 8. Goldthorpe J, Epton T, Keyworth C, Calam R, Armitage C. Who is responsible for keeping children healthy? A qualitative exploration of the views of children aged 8-10 years old. *BMJ Open.* 2019 May 27;9(5):e025245. doi: 10.1136/bmjopen-2018-025245. PMID: 31133579; PMCID: PMC6538025.
 9. <https://www.aap.org/en/patient-care/school-health/managing-infectious-diseases-in-schools/>
 10. Khan M, Adil SF, Alkhatlan HZ, Tahir MN, Saif S, Khan M *et al.* COVID-19: A global challenge with Old History, *Epidemiology and Progress* so far. *Molecules.* 2020;26(1).
 11. Dong Y, Wang L, Burgner DP, Miller JE, Song Y, Ren X *et al.* Infectious diseases in children and adolescents in China: analysis of national surveillance data from 2008 to 2017. *BMJ (Clinical research ed).* 2020;369:m1043.
 12. Dini G, Toletone A, Sticchi L, Orsi A, Bragazzi NL, Durando P. Influenza vaccination in healthcare workers: A comprehensive critical appraisal of the literature. *Hum Vaccin Immunother.* 2018 Mar 4;14(3):772-789. doi: 10.1080/21645515.2017.1348442. Epub 2017 Oct 20. PMID: 28787234; PMCID: PMC5861785.
 13. Hoekstra, B.A., Young, V.L., Eley, C.V. *et al.* School Nurses' perspectives on the role of the school nurse in health education and health promotion in England: a qualitative study. *BMC Nurs* **15**, 73 (2016). <https://doi.org/10.1186/s12912-016-0194-y>
 14. Banach DB, Johnston BL, Al-Zubeidi D, Bartlett AH, Bleasdale SC, Deloney VM, Enfield KB, Guzman-Cottrill JA, Lowe C, Ostrosky-Zeichner L, Popovich KJ, Patel PK, Ravin K, Rowe T, Shenoy ES, Stienecker R, Tosh PK, Trivedi KK; Outbreak Response Training Program (ORTP) Advisory Panel. Outbreak Response and Incident Management: SHEA Guidance and Resources for Healthcare Epidemiologists in United States Acute-Care Hospitals. *Infect Control Hosp Epidemiol.* 2017 Dec;38(12):1393-1419. doi: 10.1017/ice.2017.212. Epub 2017 Nov 30. PMID: 29187263; PMCID: PMC7113030.
 15. World Health Organization (WHO) Influenza (seasonal). Fact sheet November 2021. Available at <http://www.who.int/mediacentre/factsheets/fs211/en/> [Google Scholar]