



Improving Hand Hygiene Compliance Among Nursing Students Through Educational Programs

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Hand hygiene is one of the most effective methods for preventing healthcare-associated infections and ensuring patient safety in healthcare settings. Despite its importance, many nursing students fail to consistently follow proper hand hygiene practices during clinical training. Poor compliance contributes to the spread of infections among patients, healthcare workers, and communities. Following the COVID-19 pandemic, healthcare institutions worldwide emphasized the urgent need to strengthen infection-control practices. Nursing students, as future healthcare professionals, must develop safe clinical habits early in their education. According to a descriptive cross-sectional study conducted in tertiary care hospitals, only 56.8% of healthcare professionals demonstrated adequate knowledge regarding hand hygiene practices, highlighting the need for stronger educational interventions [1]. Therefore, improving hand hygiene compliance among nursing students is an important issue connected to Sustainable Development Goal 3: Good Health and Well-Being.

Recent evidence demonstrates that educational interventions significantly improve nursing students' hand hygiene behaviors. A quasi-experimental study by Gholizad Gougjehyaran *et al.*, 2025 [2] found that nursing students who participated in a structured educational program showed statistically significant improvement in compliance with the "Five Moments of Hand Hygiene" after the intervention [2]. Similarly, a scoping review by Meza Sierra *et al.*, 2023 [3] analyzed several educational strategies and concluded that workshops, repeated practical demonstrations, simulation-based learning, and digital learning platforms effectively increased students' hand hygiene knowledge and compliance. These findings indicate that combining technology with evidence-based teaching approaches can positively influence students' attitudes and clinical behaviors. Furthermore, culturally sensitive education is essential because students from diverse educational and cultural backgrounds may have different perceptions and practices regarding infection prevention. Gabiola & Labitigan, 2022 [4] identified barriers such as insufficient supervision, lack of practical experience, and limited awareness. An analysis by Giordano *et al.*, 2025 [5] showed that Student Nurses generally had modest knowledge regarding healthcare-associated infections, but gaps still exist in infection-control practices and preventive behaviors. Educational institutions should therefore integrate continuous and inclusive infection-control training into nursing curricula to strengthen long-term professional practice. These results are explained by the Theory of Planned Behavior established by Icek Ajzen in 1985, which emphasizes that behavior is influenced by attitudes, social support, and confidence in performing an action. Hence, the utmost importance of ongoing education, technology-based learning platforms, and culturally inclusive teaching methods in nursing education [6].

Another important factor influencing hand hygiene compliance among nursing students is the clinical learning environment. Students are more likely to practice proper infection-control measures when clinical instructors, nurses, and healthcare staff consistently demonstrate correct hand hygiene behaviors. Role modeling and supportive supervision help students develop accountability and confidence during patient care. In contrast, overcrowded clinical settings, limited availability of hand hygiene supplies, and heavy workloads may negatively affect compliance. Research has also shown that regular feedback, peer monitoring, and reminder systems can improve students' adherence to infection-control guidelines. Technological innovations such as mobile learning applications, electronic monitoring systems, and virtual simulations are increasingly being used to strengthen nursing education and promote safer clinical practices. Therefore, creating a supportive and resourceful clinical environment is essential for encouraging long-term hand hygiene compliance among nursing students.

In conclusion, improving hand hygiene compliance among nursing students is essential for reducing infection rates and promoting safer healthcare systems. Educational programs provide

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Figure:

students with the practical knowledge, confidence, and professional responsibility needed to protect patients and healthcare workers. Although awareness of infection prevention has improved in recent years, inconsistent compliance remains a challenge in many healthcare institutions. Nursing schools and healthcare organizations should continue implementing evidence-based educational strategies, simulation training, and technological tools to reinforce proper hygiene practices. Communities and healthcare professionals should also support public campaigns that encourage infection-control awareness. Readers are encouraged to share their opinions and experiences regarding hand hygiene education in nursing practice. This issue will remain highly significant in the future because infection prevention continues to be a global healthcare priority.

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