



Major article

Role of a multimodal educational strategy on health care workers' handwashing



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Background: Good hand hygiene is the single most important strategy used to prevent health care-associated infections (HAIs); however, health care workers' (HCWs') hand hygiene compliance rates range between 25% and 51%. This study aims to determine if a multimodal strategy using the World Health Organization's (WHO's) My 5 Moments for Hand Hygiene methodology increases HCWs' compliance with handwashing and awareness of the importance of good hand hygiene in the prevention of HAIs.

Methods: A quasi-experimental, 1-group pre-post survey design was used to test awareness and knowledge. A simple interrupted time series methodology at baseline and 3 months was used to monitor hand hygiene compliance.

Results: Overall, HCWs' hand hygiene compliance increased from 51.3% to 98.6%, with an odds ratio of 71.10. The pre-post survey demonstrated HCWs were aware and knowledgeable of the importance of good hand hygiene. Eight postsurvey questions focusing on the strategies used to promote hand hygiene demonstrated statistical significance using a 1-sample *t* test, with *P* values ranging from .000–.024.

Conclusion: A multimodal approach using the WHO's My 5 Moments for Hand Hygiene does increase HCWs' hand hygiene compliance and awareness and knowledge of the importance of hand hygiene in the prevention of HAIs. Using this approach can produce a positive social change by reducing preventable disease and decreasing HAIs not only within a facility but also in the community.

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INTRODUCTION

Health care-associated infections (HAIs) have become a worldwide problem causing infection prevention departments to look for ways to prevent or decrease the occurrence at their facilities. HAIs result in 99,000 deaths each year, with an estimated 2 million people contracting HAIs in the United States.¹ HAIs have remained the leading cause of morbidity and mortality. In 2002, nearly 100,000 deaths were associated with 1.7 million HAIs in the United States. A total of 15%–30% of HAIs have impacted up to 10% of hospitalized patients and are considered preventable through improved hand hygiene.² Health care administrators are concerned with the increase in HAIs because the Centers for Medicare and Medicaid

Services will no longer reimburse hospitals for certain HAIs.¹ Sax et al³ state adherence to good hand hygiene practices is the single most important strategy to use to prevent HAIs. Despite facilities stressing the importance of performing good hand hygiene to prevent disease and infection, hand hygiene compliance rates among health care workers (HCWs) remain low.² Alemangno et al⁴ state HCWs' hand hygiene compliance rates are usually 30%–60%, but they seldom exceed 50%, despite facilities' attempts to maintain good infection control practices. Many strategies have been used to help improve hand hygiene compliance among HCWs, with education and training being the main strategies. These strategies have not been successful in producing a maintainable improvement. Grol and Grimshaw (as cited in Erasmus et al, 2011) concluded hand hygiene requires a comprehensive plan, targeting different problems and barriers to change with strategies at different levels to achieve sustainable changes in hand hygiene routines.⁵

In 2005, the World Health Organization (WHO) initiated the First Global Patient Safety Challenge. The WHO aimed to improve patient safety by promoting hand hygiene in health care facilities using a multimodal strategy using alcohol-based handrubs at the points of care with this challenge.⁶ The WHO introduced the My 5 Moments for Hand Hygiene strategy, designating specific moments when hand

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hygiene is required to effectively interrupt microbial transmission during the normal care of patients.⁷ Along with the introduction of the hand hygiene strategy, the WHO introduced a standardized tool for monitoring hand hygiene compliance based on the My 5 Moments for Hand Hygiene that has been successful in monitoring hand hygiene compliance among HCWs worldwide.³

Low compliance of handwashing in HCWs leads to HAI from disease transmission and results in preventable illness and death in HCWs and patients. Single interventions have not demonstrated sustained improvement in hand hygiene compliance among HCWs. A multimodal approach using the WHO's My 5 Moments for Hand Hygiene may be more effective in improving hand hygiene compliance among HCWs than single intervention approaches. Applying a multimodal approach involves use of multiple strategies simultaneously. Leaders in the field have suggested singular interventions are insufficient to sustain behavioral change. Adopting a multimodal approach to improve hand hygiene is vital to achieving a reduction in HAIs.⁸ Further scholarship is needed to determine if combining these 2 approaches (multimodal and WHO) for handwashing can significantly improve HCWs' handwashing compliance.

Literature review

According to Pincock et al,⁸ adopting a multimodal approach to improve hand hygiene is vital to achieving a reduction in HAIs. Two key factors have limited the adoption of a multimodal approach for hand hygiene. First, most hand hygiene studies emphasize the efficacy of singular interventions. Second, many of the studies have emphasized the methods for monitoring and recording hand hygiene compliance, not sustainability. Many studies using a multimodal approach have demonstrated an overall improvement in hand hygiene compliance. Mathai et al⁷ used a multimodal interventional strategy in a mixed medical-surgical intensive care unit with significant overall improvement in hand hygiene compliance among HCWs (26% to 57.36% after the intervention). Lam et al⁹ used a multimodal approach in a neonatal intensive care unit to improve overall hand hygiene compliance and impact nosocomial infections. The overall hand hygiene compliance increased from 40% to 53% before patient contact and 39% to 59% after patient contact. The study also showed a marked improvement in hand hygiene compliance during high-risk procedures, from 35% to 60%. Carboneau et al¹ identified education, culture, and environment as the 3 main areas needing to be addressed to improve hand hygiene compliance. The study used a 6-sigma improvement methodology to address the issues. Hand hygiene compliance rates increased 20%, with a 51% decrease in methicillin-resistant *Staphylococcus aureus* cases noted over a 12-month period after interventions addressing the 3 areas were implemented. Allegranzi et al¹⁰ also found the use of a multimodal interventional approach significantly improved hand hygiene compliance from 8% at baseline to 21.8% at follow-up ($P < .001$). An important conclusion to this study was the importance of having handrub easily available for staff to perform hand hygiene.

Studies have shown a multimodal approach can have a positive long-term outcome. Four consecutive, multimodal 1-month campaigns were conducted to promote hand hygiene in Belgian hospitals between 2005 and 2011. Posters, educational sessions, promotion of alcohol-based handrub use, increasing patient awareness, and audits with performance feedback were the interventions used. Compliance with hand hygiene significantly increased from 49.6% to 68.6% during the first campaign, from 53.2% to 69.5% for the second campaign, from 58.0% to 69.1% for the third campaign, and from 62.3% to 72.9% for the fourth campaign. This study also noted physician compliance was markedly lower than nurses, and compliance rates were higher after patient contact and body fluid exposure risk than before patient contact and before performing aseptic procedures.¹¹

The literature reports poor hand hygiene compliance may be the result of several barriers. The most common reasons HCWs report for lack of adherence to hand hygiene recommendations are skin irritation, inaccessible supplies, interference with worker-patient relations, patient needs perceived as priority, wearing gloves, forgetfulness, ignorance of guidelines, insufficient time, high workload, understaffing, and lack of scientific information demonstrating improved compliance decreases HAIs.¹² In a qualitative study based on 17 focus groups, 4 themes emerged from the analyses. The themes were adherence to guidelines is compromised by HCW knowledge and beliefs, hand hygiene is practiced for personal protection, the external environment influences hand hygiene behavior, and professional responsibility. The study identified many reasons why hand hygiene practice was suboptimal despite the adoption of the WHO's new accreditation guidelines and provincial strategy for hand hygiene. Many HCWs stated current guidelines for hand hygiene were unrealistic. Physicians stated the evidence was not sufficient to support the hand hygiene guidelines. Other HCWs stated current workload and patient needs often came before hand hygiene. Participants cited personal safety as the primary reason for hand hygiene practices, especially after patient contact rather than before patient contact. Participant's also stated cited adherence by other HCWs, especially physicians, influenced their own attitudes and practices.¹³ A very important finding from the study by Jang et al¹³ was other HCWs considered their role models to be physicians. This was a significant finding when studies have shown physicians to have the lowest hand hygiene compliance rates compared with other HCWs.^{14–17}

Conceptual models and theoretical frameworks

Bandura's social cognitive theory served as the foundation to address the problem of hand hygiene compliance among HCWs. The purpose of the theory is to understand and predict individual and group behaviors, identify methods where behavior can be modified or changed, and test interventions aimed at personality development, behavior pathology, and health promotion. The theory states individuals learn by direct experiences, human dialogue and interaction, and observation.¹⁸ The theory stresses the importance of an individual being actively involved with the environment and how people actively select their own role models and regulate their own attitudes and actions regarding learning. An important concept of Bandura's theory is self-efficacy. Self-efficacy promotes learning and productive human function.¹⁹ Behavioral determinants, such as attitude, social influence, and self-efficacy, play a large role in hand hygiene compliance among HCWs.²⁰

Bandura's social cognitive theory was ideal for this hand hygiene study and target population because the theory deals with behavioral modification and how individuals decide to act and learn. The HCWs' behavioral issues and beliefs associated with hand hygiene can affect hand hygiene compliance and how the individual accepts behavioral modification strategies. Awareness of the effects of poor hand hygiene in contributing to HAIs may help to produce effective and sustained behavior changes (self-efficacy), leading to good hand hygiene compliance.⁷

Purpose statement and project objectives

The purpose of this study was to determine the extent to which a multimodal strategy for teaching and promoting hand hygiene increases HCWs' compliance with handwashing. If a multimodal intervention strategy for hand hygiene improved hand hygiene compliance among HCWs, it may offer a sustainable program for maintaining compliance. Research has shown good hand hygiene prevents infection, but there is limited research available

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