

Efficacy of Hand Hygiene Compliance Interventions: A Systematic Review

ABSTRACT

Background: The Center for Disease Control and Prevention (CDC) and World Health Organization (WHO) have considered hand hygiene as a fundamental component to reducing the rate of hospital acquired infections (HAIs). Studies have shown hand hygiene compliance among healthcare workers (HCWs) to be low. Recent studies have focused on implementing interventions to improve hand hygiene compliance in healthcare facilities. This systematic review assesses the effectiveness of multiple interventions to improve hand hygiene compliance in the healthcare setting.

Methods: Articles were chosen based on specific criteria for inclusion. Baseline and post-intervention compliance rates were recorded and analyzed along with the types of interventions used.

Results: Twenty-six articles were assessed. All showed a significant increase in hand hygiene compliance after the implementation of multiple interventions. The most frequently used interventions were education and performance feedback. Ten studies showed a significant decline in the rate of HAIs.

Conclusions: The use of multiple interventions simultaneously is an effective approach to improve hand hygiene compliance among HCWs.

BACKGROUND

The CDC reported that 1 in 25 hospitalized patients will acquire HAIs. In 2011, there were approximately 722,000 HAIs in the United States with 75,000 resulting in death. The CDC and World Health Organization (WHO) have considered hand hygiene as an effective and fundamental component to reducing the rate of HAIs. Studies have shown baseline compliance rates among various hospitals to be as low as 10%. As a result, numerous studies have focused on implementing interventions to improve hand hygiene compliance in healthcare facilities.

This review assesses the effectiveness of multiple intervention approaches to improve hand hygiene compliance in healthcare facilities. We created comprehensive analysis of the most recent findings on this topic in order to identify interventions that were most commonly used and proven effective to improve hand hygiene compliance significantly in healthcare facilities.

METHODS

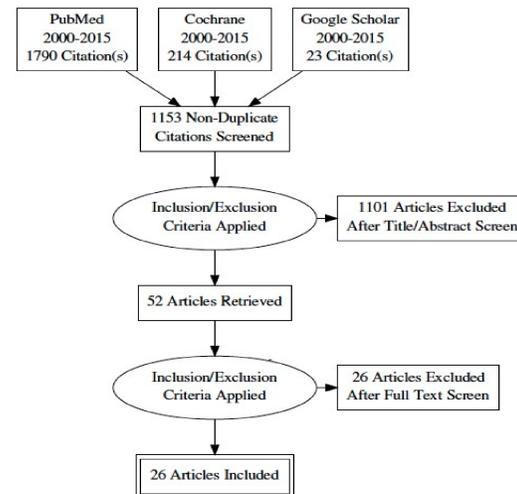
We searched online databases including PubMed, Cochrane Central Register of Controlled Trials, and Google Scholar. These searches included articles from January 2000 – June 2015. We did not apply language restrictions and only assessed articles with full-text available.

We used search terms and medical subject heading (MESH) terms relating to: hand hygiene, hand washing, compliance, interventions and healthcare workers. The initial assessment of the search results was restricted to the titles and Abstracts of each search result. Study criteria included:

- **Setting and population:** Healthcare center and healthcare workers
- **Study type:** Before and after observational, randomized controlled trial, quasi experimental
- **Interventions:** strategies focused on improving hand hygiene compliance among healthcare workers
- **Results and Statistics:** before and after results of hand hygiene compliance among healthcare workers (HCWs). Compliance must include a before and after percentage.

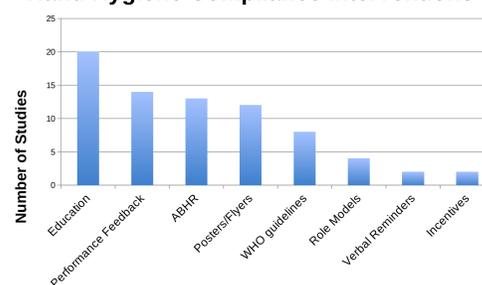
RESULTS

Our initial search yielded 1790 citations from PubMed, 214 from Cochrane, and 23 from Google Scholar, totaling to 2027 citations. Each result was inputted into EndNote and 874 duplicates were removed, yielding 1153 non-duplicate citations. 1101 articles were excluded after the abstracts and titles were assessed for inclusion criteria determined for this analysis. 52 studies were included for the full-text review. 26 articles were retrieved following the full-text review. The full-text review included assessing the quality and statistical data of each study.



Of the 26 articles reviewed, 4 studies were randomized controlled trials, with the majority being Observational (before and after) studies. The healthcare facilities predominantly used for the studies were teaching hospitals (n=10) and intensive care units (n=8). Thirteen studies stated they used covert or unobtrusive observers. The remaining 13 studies used direct observation when measuring hand hygiene compliance.

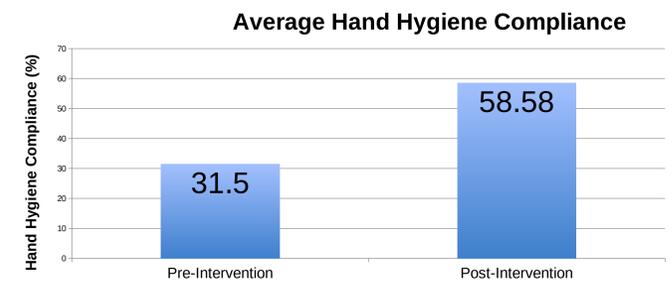
Hand Hygiene Compliance Interventions



| Intervention | # of studies/percentage |
|----------------------|-------------------------|
| Education | 20 (77%) |
| Performance Feedback | 14 (54%) |
| ABHR | 13 (50%) |
| Posters/Flyers | 12 (46%) |
| WHO guidelines | 8 (31%) |
| Role Models | 4 (15%) |
| Verbal Reminders | 2 (8%) |
| Incentives | 2 (8%) |

- Overall, the most frequently used interventions included education, performance feedback, access to alcohol based hand rub (ABHR), and visual reminders.

RESULTS



- All analyzed studies showed a statistically significant improvement in hand hygiene compliance.
- The average percent change in hand hygiene compliance was 27.08% improvement

DISCUSSION

- The duration of interventions ranged from 6 weeks to 4 years. The CDC suggests at least a 1-year intervention time period. Eleven articles had an intervention period of 1 year or less. This short duration could have been a limiting factor to the results. Further studies should implement an intervention phase of 1 year or more to eliminate this possible limitation.
- Four randomized controlled trials (RCTs) met the criteria for this review. Although previous reviews have suggested more RCTs be conducted for hand hygiene compliance interventions, still little remain.
- While half of the reviewed articles used covert and unobtrusive observers, this did not eliminate the possibility of the Hawthorne Effect. Studies have shown that hand hygiene rates increase three-fold when the observers are visible to the healthcare workers, resulting in observation bias. Covert observation doesn't eliminate this bias however, Sax et al (2009) states desensitizing HCWs through repeated exposure and unobtrusive conduct of observers can attenuate it.
- Less than half of the articles reported changes in rates of HAIs with respect to the intervention phase for hand hygiene compliance. Including these findings in future

CONCLUSION

This review further revealed the effectiveness of implementing multiple interventions simultaneously to improve hand hygiene compliance among HCWs.

- The Center for Disease Control and prevention (CDC) and World Health Organization (WHO) have considered hand hygiene as an effective and fundamental component to reducing the rate of hospital acquired infections (HAIs). Although hand hygiene and its adherence have been regarded as an effective approach to combat HAIs, studies have shown hand hygiene compliance among healthcare workers (HCWs) to be low. Studies have focused on implementing interventions to improve hand hygiene compliance in healthcare facilities. This systematic review assesses the effectiveness of multiple interventions to improve hand hygiene compliance used in healthcare facilities around the world. Twenty-six articles were assessed. All showed a significant increase in hand hygiene compliance after the implementation of multiple interventions. The most frequently used interventions were education/training and performance feedback. Ten studies showed a significant decline in the rate of HAIs. This review further solidified the use of multiple interventions simultaneously as an effective approach to improve hand hygiene compliance among HCWs.

- **Background**

Background: The Center for Disease Control and Prevention (CDC) and World Health Organization (WHO) have considered hand hygiene as a fundamental component to reducing the rate of hospital acquired infections (HAIs). Studies have shown hand hygiene compliance among healthcare workers (HCWs) to be low. Recent studies have focused on implementing interventions to improve hand hygiene compliance in healthcare facilities. This systematic review assesses the effectiveness of multiple interventions to improve hand hygiene compliance in the healthcare setting.

Methods: Articles were chosen based on specific criteria for inclusion. Baseline and post-intervention compliance rates were recorded and analyzed along with the types of interventions used.

Results: Twenty-six articles were assessed. All showed a significant increase in hand hygiene compliance after the implementation of multiple interventions. The most frequently used interventions were education/training and performance feedback. Ten studies showed a significant decline in the rate of HAIs.

Conclusions: This review further solidified the use of multiple interventions simultaneously as an effective approach to improve hand hygiene compliance among HCWs.