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The Impact of Hand Hygiene Posters on Hand Hygiene Compliance Rate among Resident Physicians: A Brief Report

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Abstract

The purpose of this study was to determine the impact of hand hygiene posters on hand hygiene behavior. After obtaining a baseline data (cycle1) on hand hygiene (HH) compliance in our pediatric intensive care unit (PICU), HH posters were visibly displayed in the unit (Cycle2). Resident physicians (RPs) were anonymously observed for hand hygiene compliance over a 60day period. With introduction of HH posters (cycle2) compliance rate increased from 22.22% at baseline to 44.74% (36.84% for pediatric residents and 7.89% for surgical residents (P<0.05). HH compliance rate in cycle 3 was only 46.66% (33.33% for pediatric residents and 13.33% for surgery residents; P=. 05) despite feedback and educational campaign at the end of cycle 2. The survey results showed improved HH compliance rate among pediatric residents after introduction of HH posters compared to their surgical counterpart. The modeling of proper hand hygiene behavior to trainees by their senior colleagues is emphasized.

Keywords Pediatric intensive care unit, Hand hygiene compliance, Hospital acquired infections, hand hygiene posters.

Introduction

Poor hand hygiene (HH) compliance increases the risk of hospital acquired infections (HAIs) in intensive care units (ICUs) through direct contamination of patients [1]. Also, HAIs from invasive devices like central venous lines and endotracheal tubes occur in ICUs because of poor HH compliance [2]. In 2002 the CDC estimated 98,000 deaths from 1.7 million HAIs (4.5 per 100 admissions) in U.S. hospitals as a result of poor HH compliance [3]. Many observational studies in ICUs show low rates of hand washing among physicians despite frequent contacts with patients on rounds [4]. This was a quality improvement survey of hand hygiene practices followed by a retrospective analysis of the impact of hand-hygiene posters (HHPs) on resident physicians' HH compliance rates in our PICU.

Methods

Data on HH compliance rate among resident physicians (RPs) was collected anonymously from August 2011 through February 2012 using a structured observational survey. Resident physicians were observed over a 12 week period from 7:00 am to 5:00 pm on weekdays by a designated PICU nurse as part of a quality improvement (QI) survey. HH compliance was determined during the following 'opportunities' for hand hygiene (OFHH): (1) before patient contact or before resumption of care after an interruption; (2) after patient contact; (3) before and after invasive procedures. A physician was considered compliant if hands were decontaminated thoroughly with liquid soap and water (LSW) for at least 15 seconds or an alcohol based hand rub (ABHR) before and after patient contact.

Baseline evaluation of hand hygiene compliance (Cycle 1):

Two designated PICU nurses observed residents for HH compliance from August-September, 2011 in order to determine baseline HH compliance rate before introduction of hand hygiene posters (HHPs).

First intervention with hand hygiene posters (Cycle 2):

HHPs were used as visual aids to reinforce HH compliance. HHPs were displayed on entrance to the PICU, at the nursing station, close to where supplies for invasive procedures are kept and by wash sinks; also, HHPs were located in close proximity to where hand washing normally occurs in order to maximize visibility. From October 2011-November 2011, HH compliance of RPs was monitored once HHPs were strategically displayed in the PICU. Feedback on HH compliance was provided to RPs on continuous basis during this cycle. HHPs were changed weekly to prevent diminished impact.

Second intervention with hand hygiene posters (cycle 3):

Another period of observation of RPs HH compliance was repeated with ongoing education and feedback using new sets of HHPs from December 2011 through January 2012.

Outcome assessment and data collection

The sole outcome measure was HH compliance rate among RPs using pre-determined hand hygiene scores (HHS): HHS=0; no hand decontamination (HD); HHS=1; HD before but not after patient contact; HHS=2; HD before and after patient contact. A score of 2 defines complete HH compliance. HH compliance rate was expressed as a percentage of OFHH per cycle. Each physician was identified by specialty in order to avoid shaming and confrontation (Figure 1).

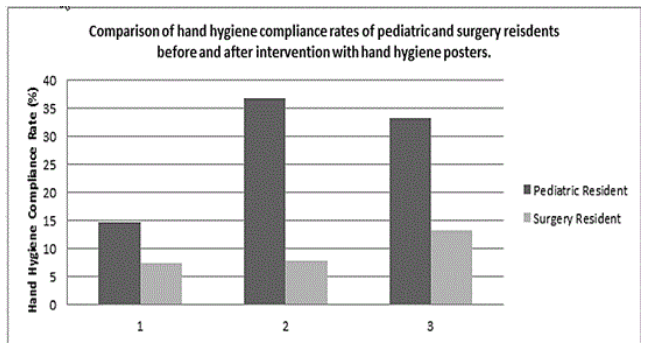

Figure 1: Comparison of hand hygiene rates.

C 1- Cycle 1: baseline observational data obtained without intervention.

C2- Cycle 2: Observational data obtained after hand hygiene education and display of hand hygiene posters. There was a minimum of 4weeks interval between cycles 1 & 2.

C3-Cycle 3: Observation data repeated 4 wks after cycle 2 by reinforcing importance of hand hygiene and by replacing some of the hand hygiene posters with new ones.

OFFH- Opportunities for hand hygiene; any encounter between resident and patients is counted as an opportunity for hand hygiene and assigned a score as described in text.

Statistical Analysis

Descriptive statistics such as percentage, proportions, and range was utilized to summarize data. Chi-square and Fisher exact test at the 5% significance level was used for further analysis of data using the Statistical Analysis Software 9.1 (SAS Institute, Cary, NC, USA).

Results

In cycle1 (C1) hand hygiene compliance rate was 22.2 % before intervention with HHPs (14.81% for pediatric residents; 7.41% for surgery residents; Figure 1). In cycle 2 (C2), compliance rate increased to 44.73% after intervention with HHPs (36.84% pediatric residents; 7.89% for surgery residents; P=.06). In cycle 3(C3), compliance rate was 46.66% (33.33% for pediatric residents and 13.33% for surgery residents; P=.05). Overall, non-compliance rate was 74.06% at baseline; 23.68% in cycle 2 & 36.66% in cycle 3.

Discussion

Hand hygiene compliance rate was low in our PICU (22.22%) prior to intervention. Ignorance, inaccessible wash sinks and residents work load are major barriers to HH compliance in our PICU. Our residents used LSW more than ABHR because they considered it the ideal method of hand decontamination. ABHR takes 10-20 seconds to apply compared to 90-120 seconds for LSW [5]; therefore, time necessary for hand hygiene in ICUs can be decreased with use of ABHR without leaving the bedside and in-between patient care activities [6]. If residents are educated on use ABHR for hand decontamination a major barrier to HH compliance like lack of time will be eliminated [7]. When the intensity of patient care exceeded 10 OFHH/hour, HH compliance is decreased by 5 % (± 2%)V [8]. There was no difference in OFHH between pediatric and surgery RPs in our survey but cumulative OFHH may be higher for surgery RPs because of the consult services they provide to other patients in the hospital. Therefore, time pressure from additional patient care responsibilities outside the PICU could explain the low HH compliance rate observed among surgery RPs. Low HH compliance increases the risk of HAIs because residents rotate from one hospital ward to another in fulfillment of training requirements. Though HH compliance improved compared to baseline, the improvement was not statistically significantly between intervention cycles despite feedback on hand hygiene practices (Figure 1). Lack of significant change in HH compliance between interventions could be from diminished educational impact of the HHPs with time or the manifestation of a Hawthorne effect [9] (awareness of being watched) rather than a true change in hand hygiene behavior. High turnover of residents in the PICU could also account for lack of sustainable increase in HH compliance because newly assigned residents need time to adapt to changes. In addition, surgery residents could not participate in educational feedbacks on HH compliance because they are not primarily assigned to the PICU. A small sample size and observation bias from exclusion of other PICU staffs from this survey is a major limitation of this study. Despite these limitations, our results identified low HH compliance among our RPs. As a result of these findings HH compliance training is now mandatory for residents' orientation in our PICU [10].

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