



Major article

Effect of hand sanitizer location on hand hygiene compliance

Laila Cure PhD^{a,*}, Richard Van Enk PhD, CIC^b^a Department of Industrial and Manufacturing Engineering, Wichita State University, Wichita, KS^b Infection Prevention and Epidemiology, Bronson Methodist Hospital, Kalamazoo, MI

Key Words:

Hand sanitizer dispenser
Location
Usability
Standard
Hand hygiene compliance

Background: Hand hygiene is the most important intervention to prevent infection in hospitals. Health care workers should clean their hands at least before and after contact with patients. Hand sanitizer dispensers are important to support hand hygiene because they can be made available throughout hospital units. The aim of this study was to determine whether the usability of sanitizer dispensers correlates with compliance of staff in using the sanitizer in a hospital. This study took place in a Midwest, 404-bed, private, nonprofit community hospital with 15 inpatient care units in addition to several ambulatory units.

Methods: The usability and standardization of sanitizers in 12 participating inpatient units were evaluated. The hospital measured compliance of staff with hand hygiene as part of their quality improvement program. Data from 2010-2012 were analyzed to measure the relationship between compliance and usability using mixed-effects logistic regression models.

Results: The total usability score ($P = .0046$), visibility ($P = .003$), and accessibility of the sanitizer on entrance to the patient room ($P = .00055$) were statistically associated with higher observed compliance rates. Standardization alone showed no significant impact on observed compliance ($P = .37$).

Conclusion: Hand hygiene compliance can be influenced by visibility and accessibility of dispensers. The sanitizer location should be part of multifaceted interventions to improve hand hygiene.

Copyright © 2015 by the Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

Hand hygiene is a widely accepted method to prevent the spread of health care-associated infections. In 2002, the Centers for Disease Control and Prevention established guidelines for hand hygiene in hospitals.¹ In 2009, the World Health Organization² published guidelines on hand hygiene in health care for a global audience, followed by guidelines for hand hygiene in outpatient settings in 2012. Since 2002, improving compliance with hand hygiene recommendations has become an important goal for health care organizations. Research literature has focused on studying noncompliance with hand hygiene³ and on developing interventions to improve compliance.

Most of these interventions involve some form of education, such as training sessions,^{4,5} video lectures,^{6,7} and innovative education strategies based on modern behavioral theories.⁸ Other common interventions include initiatives to change organizational culture,^{9,10} provide feedback and rewards to health care workers,¹¹⁻¹³

redesign facilities,^{14,15} redefine procedures,¹⁶⁻¹⁸ involve patients and their families to remind staff to wash their hands,^{14,19} and improve hand hygiene products.^{20,21} Studies show that using multiple factors in an intervention is important to improve compliance. Many studies describe multimodal or multifaceted interventions using a combination of strategies to address several factors simultaneously. Nevertheless, studies often emphasize 1 component (eg, education), while broadly mentioning the importance of the others (eg, patient involvement, agent, rewards) without much detail.^{6,18,22,23}

We decided to study 1 factor affecting hand hygiene compliance: the facility design and location of the sanitizer in the patient room. Accessibility of cleaning agents, either handwashing sinks or waterless sanitizer, has been recognized as an important factor in compliance with hand hygiene guidelines.^{2,15,24-27} Because they can be installed practically anywhere, alcohol-based hand sanitizer dispensers have become an important means to accomplish hand hygiene by health care providers in hospitals.

The physical location of these dispensers is often recognized as an important component of hand hygiene practices²⁸ and has been mentioned in many studies on interventions to improve hand hygiene compliance. Most of these studies recommend placing the

* Address correspondence to Laila Cure, PhD, Department of Industrial and Manufacturing Engineering, Wichita State University, 1845 Fairmount St, Wichita, KS 67260.

E-mail address: laila.cure@wichita.edu (L. Cure).

Conflicts of interest: None to report.

dispensers by the entrance of rooms and by the point of care to support the World Health Organization's My 5 Moments for Hand Hygiene.²⁹ Nevertheless, few studies have focused on studying the effect of the physical location of hand sanitizer dispensers on compliance^{14,15,30,31} or on providing explicit guidelines to evaluate and determine such locations.^{29,32,33}

This study uses an engineering approach to quantitate the relationship between usability characteristics of hand sanitizer locations within hospital rooms and hand hygiene compliance rates obtained from existing hospital data.

MATERIALS AND METHODS

Study setting

The study took place in a 404-bed, private, nonprofit community hospital in the Midwest. At the time of the study, the hospital consisted of 15 inpatient patient care units, including 6 critical care units and several ambulatory or noninpatient units, such as emergency, hemodialysis, endoscopy, radiology, and post-anesthesia recovery units. The hospital rooms were not designed to be identical; there were many different room configurations used in the hospital with many possible locations of wall-mounted sanitizer dispensers. The rooms within each patient care unit, however, tended to have a similar design; therefore, rooms within a patient care unit tended to be more similar to each other (less variability in usability and more standardization) than rooms in other units. The hospital was built before the 2002 hand hygiene guidelines were published and was not initially designed to accommodate hand sanitizer. Hand sanitizer dispensers were retrospectively added to each patient space at locations where there was space available on the wall, not as a part of the initial room design. Because there were many room configurations and much variation in sanitizer location within the rooms in a unit, the study required assessment of usability both at the individual room and unit level.

Hand hygiene compliance

Data on compliance rates were routinely collected for quality improvement purposes (other than this study) between February 2010 and February 2012. Observers stationed themselves at locations where they could observe patient encounters. Because the focus was on observing patient encounters rather than on sampling rooms equally, sample sizes for rooms were not consistent. Observers conducted their sampling in a covert way and did not notify the health care worker that they were being observed or give feedback during data collection.

The compliance rate is calculated as the number of times in which the worker performed a hand hygiene event (including either handwashing at the sink or use of hand sanitizer) divided by the total number of observed opportunities for hand hygiene included in that encounter. The denominator included only opportunities that the observer could see; if the door was closed or the worker was out of view, the opportunity was not documented. For quality improvement purposes, compliance measured in all the rooms of a patient care unit was calculated as a unit score.

There were no changes in hand sanitizer dispenser locations or addition of new dispensers in the patient rooms during the period of the study. There was a signage campaign that was implemented in the second half of 2011 when the manufacturer of the sanitizer designed and marketed a small sign holder that mounted on top of each dispenser. The hospital designed a small sign to fit in the sign holder that encouraged staff and visitors to use the sanitizer to protect themselves and patients, and the new sign was installed in

all patient rooms at approximately the same time. Data did not show that the signs significantly improved hand hygiene.

Evaluation of dispenser locations

We used the metrics proposed by Cure et al.²⁹ to evaluate the locations of sanitizer dispensers. The authors proposed 2 metrics: a usability score to evaluate individual locations within a room and a standardization score to complement the usability score at the unit level.

Usability score

The usability score measures how user-friendly a location is in terms of room layout and workflow. The score evaluates 7 usability characteristics that have been consistently mentioned in the hand hygiene literature with respect to the location of hand sanitizer dispensers: (1) easily visible on entry, (2) easy and unobstructed access, (3) within arm's reach or <1 step from the entrance, (4) visible from the point of care, (5) along the physical workflow path, (6) within arm's reach or <1 step from the point of care, and (7) placed at optimal height (85-110 cm above the floor).^{29,33} A data collection sheet was designed to evaluate patient rooms. For each unit and room, the number of dispensers serving the room and the presence or absence of usability characteristics were recorded. A usability score was calculated using the following information: K , the set of desirable characteristics of the dispenser location (in our case $K = \{1, \dots, 7\}$); A , the set of patient care rooms in the unit of interest; and g_{ak} , the indicator if characteristic $k \in K$ is met by at least one of the dispensers that serves room $a \in A$ ($g_{ak} = 1$) or not ($g_{ak} = 0$).

Each patient room $a \in A$ was scored using the weighted sum of the usability characteristics met by the dispensers serving it, as follows:

$$\gamma_a = \sum_{k \in K} \omega_k g_{ak}, \quad \forall a \in A$$

where γ_a is the usability score for room $a \in A$, and ω_k is the relative weight of the importance of characteristic $k \in K$ for the decision-maker. It is suggested to make $\sum_{k \in K} \omega_k = 1$ for ease of interpretation. Further suggestions to determine the weights of each characteristic are provided in Cure et al.²⁹

Because hand hygiene data are usually collected by hospital patient care units, the individual room usability scores were used to calculate an average usability of a patient care unit as follows:

$$\text{Unit usability score} = \sum_{a \in A} \frac{\gamma_a}{|A|}$$

where $|A|$ represents the number of patient rooms in the unit.

Standardization score

Although the unit usability score represents how well the key usability characteristics are met per room in a unit, the standardization score shows how uniform the placement of these dispensers is throughout the unit. The standardization score is a unit characteristic and represents the maximum proportion of rooms within the unit with a dispenser installed in a consistent location, regardless of the actual usability of such location.²⁹ For example, if a unit has a standardization score of 1, it means that 100% of the rooms in the unit have a sanitizer dispenser in the same location (eg, 100% of the rooms have a sanitizer by the entrance). Likewise, a standardization score of 0.6 means that 60% of the rooms in the unit have a sanitizer placed in the same location, whereas the sanitizers in the remaining 40% of the rooms are in different locations.

Download English Version:

<https://daneshyari.com/en/article/2636714>

Download Persian Version:

<https://daneshyari.com/article/2636714>

[Daneshyari.com](https://daneshyari.com)