American Journal of Infection Control 45 (2017) 240-4

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

A nationwide covert observation study using a novel method for hand hygiene compliance in health care

Kuan-Sheng Wu MD [a,b], Yao-Shen Chen MD [a,b,c], Huey-Shyan Lin PhD [d], E-Lun Hsieh [a], Jui-Kuang Chen MD [a], Hung-Chin Tsai MD, PhD [a,b,e], Yen-Hsu Chen MD, PhD [f,g], Chun-Yu Lin MD [f,g,h], Ching-Tzu Hung RN [h], Cheng Len Sy MD [a], Yu-Ting Tseng MD [a], Susan Shin-Jung Lee MD, PhD [a,b,*]

[a] *Division of Infectious Diseases, Department of Internal Medicine, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan*
[b] *School of Medicine, National Yang-Ming University, Taipei, Taiwan*
[c] *Graduate Institute of Environmental Education, National Kaohsiung Normal University, Kaohsiung, Taiwan*
[d] *Department of Health-Business Administration, Fooyin University, Pingtung, Taiwan*
[e] *Infection Control Unit, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan*
[f] *Division of Infectious Diseases, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan*
[g] *School of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan*
[h] *Infection Control Unit, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan*

Key Words:
Hand hygiene
Covert observation
Compliance
Handrubbing percentage
Taiwan

Background: Evaluation and feedback is a core hand hygiene (HH) improvement strategy. The covert observation method avoids observation bias inherent to the overt method. The aim of the study was to observe HH compliance by a novel covert method in a real-world setting.

Methods: We conducted a 2-year, nationwide, prospective, observational study in teaching hospitals across Taiwan. Medical students and students who may have contact with patients in their careers were recruited as participants. A novel, shorthand notation method for covert observation was used. Observation results were reported through a study website.

Results: There were a total of 25,379 HH opportunities covertly observed by 93 observers. Overall HH compliance was 32.0%. Health care workers had the highest HH compliance for indication 4 (42.6%), and the lowest for indication 5 (21.7%). Overall handrubbing percentage was high, reaching 83.6%. The HH compliance increased significantly with an increase in the number of indications within 1 HH opportunity ($P < .001$).

Conclusions: The overall HH compliance by the covert observation method was low. An innovative shorthand notation method facilitated covert observation, and website reporting was demonstrated to be feasible for large-scale observation.

Hand hygiene (HH) is the cornerstone of infection control. HH observation and feedback is one of the 5 major HH promotion strategies recommended by the World Health Organization (WHO).[1] Pittet et al[2] were pioneers to use the direct method to observe HH in health care in 1994 and to identify the factors associated with noncompliance of HH. Since then, the direct method has been considered the gold standard for HH observation.[1,3] However, there remains 3 major biases: observation, observer, and selection bias. Observation bias, also known as the Hawthorne effect, can be eliminated when health care workers (HCWs) are unaware of being observed, the so-called covert observation. Only a few studies reported on HH compliance derived from the covert observation method.[4-9] One study was conducted in 2 hospitals,[7] and the others, in 1 facility.[4-6,8,9] However, none of the studies described the methodology on how to conduct covert observation.

Innovative electronic monitoring systems (EMSs) for automatic monitoring of HH compliance may reduce the Hawthorne effect and mitigate observer bias. They have the advantages of continuous monitoring over time, without requiring expenditure of time and human resources. However, there is limited evidence to validate their use compared with direct observation, their cost-effectiveness remains uncertain, and accurate monitoring of the

* Address correspondence to Susan Shin-Jung Lee, MD, PhD, Division of Infectious Diseases, Department of Internal Medicine, Kaohsiung Veterans General Hospital, 386 Ta-Chung 1st Rd, Kaohsiung 81346, Taiwan.
E-mail address: ssjlee28@yahoo.com.tw (S.S.-J. Lee).

Funding/support: Supported by the Taiwan Center for Disease Control (grant no. DOH9X-DC-1208).
Conflicts of interest: None to report.

0196-6553/
http://dx.doi.org/10.1016/j.ajic.2016.10.010

quality of the HH action and the My 5 Moments for Hand Hygiene using EMSs remains a challenge.[10-12]

The Taiwan Centers for Disease Control (TCDC) initiated a national HH promotion campaign in Taiwan since 2009. Three major university teaching hospitals were chosen as demonstration centers and adopted the WHO guidelines to promote HH in their respective hospitals. Thereafter, another 323 hospitals joined the campaign. After receiving a series of audits and validations, 246 hospitals were certified as facilities with good HH performance. By the end of 2011, TCDC officially announced that the overall HH compliance across the country reached 87.1%, using the direct overt observation method.[13] Detailed subanalysis of the results was not provided.

Knowledge of the strengths and barriers encountered in a nationwide HH program is crucial for the planning of better and more effective strategies for the implementation of HH programs in the future. Therefore, we initiated a HH educational program targeting medical students, and recruited validated observers to participate in a nationwide covert HH observation study in Taiwan. This study aims to standardize the methodology of covert observation by introducing a novel shorthand method, and to examine its feasibility when applied to large-scale observation in the real-world setting. The conduction and results of this covert observation system will be useful to hospitals and health authorities for creating innovative HH programs and effective implementation strategies.

MATERIALS AND METHODS

Kaohsiung Veterans General Hospital (KVGH) is a tertiary teaching hospital with 1,408 beds and is located in Kaohsiung City, the second largest city in Taiwan. KVGH was selected as one of the 3 HH demonstration centers in 2009, during a nationwide HH promotion campaign in Taiwan.[14] During the campaign, we were surprised to find that medical students received very few lectures and generally lacked training on HH. Therefore, the KVGH infection control team initiated a multifaceted educational program since 2012, to teach medical students on the importance of performing HH. The main purpose of the program was to embed HH concepts in medical students at the very beginning of their professional careers, thereby leading to improvements in their knowledge, attitude, and behavior toward HH.

Participants

Medical students who had an internship rotation in KVGH were eligible participants. The program was also open to students who may have contact with patients in their future careers, such as students in the department of nursing, physical therapy, and dentistry. The study protocol was approved by the Institutional Review Board of KVGH, and participants signed informed consents.

Training and validation

All participants received a multifaceted, standardized, educational program on HH. The program consisted of a 4-hour lecture on the basic concepts and techniques of HH, HH observation methods, HH covert observation techniques, including watching a video from the WHO website to better learn how HH is performed in common health care scenarios,[15] and group discussions to strengthen HH concepts and develop consistency in HH observation. All of these teaching materials were validated by infection control experts and delivered to the students by the same lecturer. One week after completion of the training session, participants were validated by a standardized test, which consisted of 10 single-choice questions, and their HH skills were evaluated by observing for HH opportunities in 5 videos of health care scenarios filmed by the KVGH infection control team. Participants were required to score ≥80% in both written and practical parts of the examination to pass. Participants who passed the test were awarded certificates and recognized as qualified HH observers.

Observation

Participants who were certified as qualified HH observers were invited to covertly observe HH in the real-world health care settings during their internship rotations in various teaching hospitals across Taiwan. Before starting HH observations, the participants were asked to sign a self-commitment and obligation document, which pledged to observe and report HH performance candidly, and to keep the observations as covert as possible. We also provided a phone number of an infection control expert to the participants, for easy access to consults or to answer any queries they may have during the study period. Participants were encouraged to observe HH during their clinical routines without compromising their training. The covert observation period was from March 2012-December 2013. Discussion meetings were held quarterly after the study begun. A recap on important HH concepts and techniques was presented, and frequently asked questions were addressed during the meeting.

Definitions

A HH opportunity was a moment when HH action is required to interrupt germ transmission. HH indication refers to the reason for a HH action. We defined HH indications 1-5 based on the WHO's My 5 Moments for Hand Hygiene, that is, before touching a patient, before clean/aseptic procedure, after body fluid exposure risk, after touching a patient, and after touching patient surroundings, respectively.[16] Handrubbing percentage, defined as the percentage of alcohol-based handrubbing of all HH actions performed, was an indicator for good system change if the number was >80%.[17]

Covert observation techniques

A unique coding system was created to aid participants to remember the observation results correctly, and to reduce recall bias. In short, we used the numbers 1-5 to represent 5 HH indications and R for handrubbing, W for handwashing, and N for no HH action. For example, when a nurse measured vital signs of 2 consecutive patients and washed hands by handrubs between patients as needed, participants would quietly memorize 14R, or write down in shorthand on a notepad for these observed HH opportunities. When a physician performed handwashing before inserting a nasogastric tube for a patient, the opportunity was recorded as 2W. To further reduce recall bias, the observers were encouraged to record the codes on notepads or pieces of paper as soon as possible, and after observing no more than 2-3 HH opportunities.

Reporting

HH compliance was reported through a restricted website established specifically for this study. The website system recorded the code of observer automatically with each HH opportunity, except during the first 6 months of the study period. The location and level of the hospitals were recorded instead of the hospital names except for KVGH because of ethical considerations. Every HH opportunity observed and reported was compensated by $0.30.

Data analysis

All observation results were exported from the website into Excel 2010 (Microsoft, Redmond, WA). To represent nationwide HH