



## Major article

## Medical students' perceptions of their role as covert observers of hand hygiene

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**Background:** Medical students served as covert observers of hand hygiene (HH) compliance by health care workers (HCWs) during a recent 1-year study at a teaching hospital in Taiwan. This report describes the students' experience and their views of the major factors that led to good or poor compliance.

**Methods:** Nine upper class medical students received a basic course in HH and attended a workshop using World Health Organization standard training materials. A standardized observation tool was used to collect data on HH performance by the HCWs. On completion of the study, structured face-to-face interviews were conducted to assess the students' experiences.

**Results:** The medical students observed a total of 17,742 HH opportunities during the study period. Eight of the 9 students participated in the poststudy interviews. Overall, the students believed that they had gained considerable knowledge of the attitudes regarding HH compliance by nurses, physicians, and surgeons according to each of the 5 HH indications. Based on their experience, they recommended that compliance could be improved by ensuring an adequate supply of HH products and by promoting role modeling in the ward, reminding, education in small groups, and objective structured clinical examinations.

**Conclusions:** The opportunity for medical students to serve as covert observers broadened their knowledge of how infections are transmitted in hospitals and of the barriers that must be overcome to improve HCWs' HH compliance.

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In the World Health Organization (WHO) global patient safety initiative launched in 2005, evaluation and feedback of hand hygiene (HH) compliance were considered key elements of the multimodal strategy for hospital infection control. The Guidelines on Hand Hygiene in Health Care published by the WHO and the Centers for Disease Control and Prevention recommend direct

observation of HH compliance.<sup>1-3</sup> HH performance usually improves when health care workers (HCWs) know that they are under observation.<sup>4</sup> Confounding by observer bias might account in part for the wide variation in reported rates of compliance, which range from 28% to 81% in observational studies conducted in various parts of the world.<sup>5</sup>

We recently performed a 1-year prospective study of HH compliance by HCWs at a large teaching hospital in Taiwan.<sup>6</sup> To avoid observer bias, we invited medical students to serve as covert observers during their clinical clerkships. We reasoned that because medical students are an integral part of the health care team, they would have multiple opportunities to unobtrusively observe HH practices during daily rounds. The medical students observed 76.0% of the 23,333 HH encounters. They reported an annual compliance rate of 44.1%, compared with 74.4% reported

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by infection control nurses and 94.1% reported by unit administrators ( $P < .001$ ).<sup>6</sup> These large differences call into question the ability of overt observers to adequately assess HH compliance. The medical students' findings are consistent with the 48% compliance reported by Pittet et al<sup>2</sup> in a well-conducted active surveillance study.

In this report, we describe the students' experiences and their views of the major factors that led to good or poor HH compliance.

## MATERIALS AND METHODS

### Ethics

The study was approved by the Ethics Committee of National Taiwan University Hospital (approval 201111059RIC). Written informed consent was obtained from all medical student participants.

### Hospital setting and HH program

National Taiwan University Hospital is a 2,200-bed major teaching hospital in Taipei that provides both primary and tertiary medical care. A hospital-wide HH program using an alcohol-based hand rub was implemented in 2004 and promoted annually.<sup>7</sup> The hospital adopted the WHO multimodal HH improvement strategy in 2009. The action plan and HH campaigns have been described in detail previously.<sup>6</sup>

### Participants

The participants consisted of 9 volunteer fifth- to seventh-year medical students who had served as covert observers during a 1-year period from October 2010 to September 2011.<sup>6</sup> During this period, the students rotated as clinical clerks on the medical, surgical, gynecologic, and pediatric services and attended ward rounds with the assigned medical team. Ward staff members were not aware of the students' role as covert observers.

The students took the same basic course on HH practices as other HCWs. In addition, they participated in a 2-hour workshop using WHO standard training materials. This included a training film that provided case scenarios demonstrating the 5 indications for HH. A standardized HH observation test, modified from the HH observation tool test developed in the United Kingdom,<sup>8</sup> was used to evaluate the students' ability to serve as observers. The students' scores on the HH observation test was  $100 \pm 0$  (total score, 100).

### Interviews

The structured face-to-face interviews were based on the established behavioral determinants model of the theory of planned behavior.<sup>9</sup> A structured list was devised to guide the interview (Table 1). Questions explored attitude, subjective norm, perceived behavioral control, and intention. All interviews were led by the same interviewer and lasted for 30–60 minutes. The interviews were audiotaped and transcribed verbatim.

The transcripts were systematically analyzed using thematic content analysis.<sup>10</sup> Two researchers (S.-C.P. and T.-S.L.) inspected each transcript and applied initial open codes to describe each unit of meaning. Through comparison across the transcripts, the open codes were organized into related sets of thematic categories. Disagreements were discussed and then resolved by an additional researcher (Y.-C.C.). The original data were recorded in Mandarin and then translated into English. The most relevant statements that best reflect the consensus student responses are presented in the next section.

**Table 1**

Topics covered in the structured interview guide for medical students after their experience as covert observers of HH

Topic	Discussion questions
Attitudes	What did you think about HH before joining the program? What do you now think about HH after completing the program?
Subjective norm	Describe your observations of how well HCWs complied with HH. Were you ever reminded to perform HH?
Perceived behavior control	Describe specific occasions where you witnessed good HH being performed and possible reasons why. Describe specific occasions where you witnessed poor HH being performed and possible reasons why.
Intent	Did your experience improve your own HH compliance and encourage you to remind others?

## RESULTS

### Medical students' perceptions of their experience as covert observers

The students' perception of their experience, extracted from the exit interviews, revealed the following consensus. They believed that the training and experience as participants in the program reshaped their attitudes and intentions concerning HH. They understood the rationale, memorized the 5 indications, recognized that HH protects patients and improves patient–caregiver relationships, and improved their own compliance. All 8 students expressed willingness to participate in future HH programs. Five believed that this transformation in their behavior will persist through their future careers. One student summed up his attitude before participating in the program: “Because of our huge workload, I don't think badly of those who do not perform HH, but I would admire those who had good compliance.”

### Medical students' assessment of teaching methods

The students preferred the video presentations and small group discussions to lectures: “The scenario video you showed us, I think it's simple and clear.”

“I never saw anyone who really listens to an online tutorial. They just start the computer and do their own business.”

### Medical students' perceptions of factors affecting good compliance

Participants mentioned several factors that they believed were most often associated with good HH. These are listed in order of importance with comments.

#### HH equipment

“I think there was a lot of hand hygiene equipment in the hospital; actually, it was super-available.”

#### Leadership

“After seeing that the attending physician had washed his hands, all the others followed suit to press the it [alcohol-gel dispenser].”  
“While making the ward rounds, the teacher [attending physician] would remind us, ‘Let's wash our hands before entering the room.’”

#### Reminding

The students were somewhat ambivalent about reminding. They were reluctant to embarrass others or to challenge authority and would remind only their classmates or HCWs with whom they were familiar. “It depends on if we can communicate, or if my position is suitable to do that, that is, if we're on the same level.”

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