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Short report

Baseline evaluation of hand hygiene compliance in three major hospitals, Isfahan, Iran

B. Ataei [a], S.M. Zahraei [b], Z. Pezeshki [b], A. Babak [c], Z. Nokhodian [c], S. Mobasherizadeh [c], S.G. Hoseini [c,*]

[a] Nosocomial Infection Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[b] Center for Disease Control, Ministry of Health and Medical Education, Tehran, Iran
[c] Infectious Diseases and Tropical Medicine Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

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SUMMARY

Hand hygiene is the mainstay of nosocomial infection prevention. This study was a baseline survey to assess hand hygiene compliance of healthcare workers by direct observation in three major hospitals of Isfahan, Iran. The use of different hand hygiene products was also evaluated. In 3078 potential opportunities hand hygiene products were available on 2653 occasions (86.2%). Overall compliance was 6.4% (teaching hospital: 7.4%; public hospital: 6.2%; private hospital: 1.4%). Nurses (8.4%) had the highest rates of compliance. Poor hand hygiene compliance in Isfahan hospitals necessitates urgent interventions to improve both hospital infrastructure and staff knowledge.

Introduction

Proper hand hygiene is confirmed to be an effective and simple way to reduce transmission of pathogens from healthcare workers (HCWs) to patients and vice versa; it is the mainstay of healthcare-associated infection prevention strategies.[1] However, many studies have identified that the compliance of HCWs with hand hygiene is low, and multimodal approaches are crucial to improve and maintain optimal hand hygiene practice in healthcare facilities.[2] Such studies in Iran are rare, and have shown low compliance ranging from 8% to 22%.[3,4] No previous study on hand hygiene compliance has been carried out in Isfahan, a large city in central of Iran. This study was intended to establish baseline hand hygiene compliance rates, and to help provide an understanding of the barriers to hand hygiene, ahead of an initiative to promote hand hygiene in our health region.

Methods

Direct observation was used to assess the hand hygiene compliance of the HCWs in three hospitals in Isfahan: a 763-bed teaching hospital, a 186-bed public hospital, and a 124-bed private hospital. The teaching and the public hospitals are parts of Isfahan University of Medical Sciences, Ministry of Health. The teaching hospital is a tertiary referral hospital of relatively new design. The public and private hospitals provide a narrower range of specialties and are older, although the private hospital had been recently refurbished and was well-equipped.

Seven observers were selected from those familiar with clinical care and they underwent intensive training on the World Health Organization (WHO) 'five moments', provided by a senior researcher and supported by a WHO training film. Observers then undertook trial assessments to ensure that their observations were consistent. The study was conducted in the

* Corresponding author. Address: Infectious Diseases and Tropical Medicine Research Center, Isfahan University of Medical Science, Isfahan, Iran. Tel.: +98 311 3359359; fax: +98 311 3353737.
E-mail address: shghaffari@yahoo.com (S.G. Hoseini).

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three hospitals over seven working days during a two-week period in November 2010. HCWs (physician, nursing staff, student, allied health professional, ancillary staff) were observed during their routine work for eight episodes of 20 min in different hours of morning and evening daytime shifts. Observers were settled in places where they caused minimal interference with patient care and patient privacy. Only non-specialized wards and departments were included in the study.

The study was approved by the Ethical Committee of Isfahan University of Medical Sciences, Ministry of Health, Iran. Hospital administrators and ward managers in all three hospitals also approved the study. All staff were made aware of the proposed programme, and were assured that data would be recorded anonymously.

For each opportunity, the types of hand hygiene products available (soap and water, alcohol dispenser, or both) and hand hygiene behaviour of the observed staff (nothing, hand washing or hand rubbing) were recorded in a predesigned checklist. The type of hospital and department within the hospital, type of opportunity according to the 'My five moments for hand hygiene' concept, and time of day when the observation was made were also recorded.

Data were analysed using SPSS-PC version 16.0 (SPSS Inc., Chicago, IL, USA). Variation of hand hygiene compliance was assessed by χ^2-test or Fisher's exact test whenever appropriate. Logistic regression models were used to calculate the odds ratios and 95% confidence intervals. $P < 0.05$ was considered statistically significant.

Results

In all, 3078 hand hygiene opportunities were recorded in the three hospitals. At least one type of hand hygiene product (water supply and plain soap, or alcohol dispensers) was available in all opportunities in the teaching and the private hospitals but only in 62% of opportunities in the public hospital (Table I). Hand-wash basins were located at the entrance to all patient rooms and wards in teaching and private hospitals, but the public hospital mostly had only a single hand-wash basin in each ward or department, and with limited availability of paper towels. Alcohol dispensers, when available, were attached to nursing trolleys or were fixed on the wall in patient rooms, but were not available at all points of care.

In 2653 opportunities with available hand hygiene products (either soap and water, or alcohol dispensers) the rate of hand hygiene compliance was 6.4%. When both soap and alcohol dispensers were available, HCWs preferred to wash their hands rather than rub with alcohol (6.1% vs 1.7% of potential 1532 opportunities, $P < 0.001$). Hand hygiene compliance was different in three hospitals ranging from 7.4% in the teaching hospital to 6.2% in the public hospital and 1.4% in the private hospital ($P < 0.001$).

Multivariate analysis showed that type of hospital, type of ward or department, type of HCW and type of hand hygiene opportunity were associated with degree of hand hygiene compliance after adjustment of each variable for other covariates (Table II).

Discussion

Hand hygiene has been considered a critical component of standard precautions in Iran since 2003. Since then, hospital infection control nurses have been routinely trained and assessed by experts, and were then made responsible for cascade training of other hospital staff. Manufacture of alcohol solutions, gels and foams commenced in Iran, and these products were distributed to all hospitals. In 2005 the National Nosocomial Infection Surveillance (NNIS) system was initiated in Iran and infection control units and committees in all public and private hospitals were required to monitor and report nosocomial infections and promote standard safety measures including hand hygiene according to national published guidelines.[5] The Global Patient Safety Challenge 'Clean Care is Safer Care' was launched in Iran in May 2007. Four hundred hospitals across the country have joined the challenge so far, the highest rate in the Eastern Mediterranean Region.

Because evaluation (as opposed to promotion) of hand hygiene compliance has not been the subject of national guidance in Iran, rates of compliance are unknown. The purpose of this study was to provide a baseline evaluation of hand hygiene compliance in different hospital settings in Isfahan. The overall compliance was 6.4% ranging from 0% to 26.3% depending on the type of hospital and department within that hospital. Studies reported by the WHO showed compliance ranging from 5% to 80% with an average of 38.7%; thus the rate of hand hygiene compliance is unacceptably low in our hospitals.[1] It seems that despite national policies on hand hygiene in Iran, and affirmation of these by health leaders and managers, the majority of HCWs had either insufficient knowledge or no incentive to improve their practice.

Hospitals included in this study were different in their infrastructure, economics and policies. The private hospital had the lowest compliance despite better facilities in comparison with the teaching and the public hospitals; lower incomes and lack of a hierarchical management system for HCWs in the private hospital might have reduced their motivation to attend training courses and to comply with good practice. Further work to investigate the reasons for poor compliance in the private hospital is required.

Where a choice of hand-washing facilities and alcohol rub were available the latter was infrequently employed by HCWs (1.7% vs 6.1%). The reluctance to use alcohol rub was probably due to lack of knowledge and concern about the drying effect of alcohol on skin. There are no religious objections to the use

Table I
Availability of hand hygiene products at potential hand hygiene opportunities in three hospitals

Available products	Teaching hospital	Public hospital	Private hospital	Overall
Soap and water only	561/1665 (33.7%)	290/1117 (26%)	—	851/3078 (27.6%)
Alcohol rub only	—	270/1117 (24.2%)	—	270/3078 (8.8%)
Both products	1104/1665 (66.3%)	132/1117 (11.8%)	296/296 (100%)	1532/3078 (49.8%)
None	—	425/1117 (38.0%)	—	425/3078 (13.8%)