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Impact of the International Nosocomial Infection Control Consortium (INICC) multidimensional hand hygiene approach in 3 cities in Brazil



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Background: Hand hygiene (HH) is the main tool for cross-infection prevention, but adherence to guidelines is low in limited-resource countries, and there are not available published data from Brazil.

Methods: This is an observational, prospective, interventional, before-and-after study conducted in 4 intensive care units in 4 hospitals, which are members of the International Nosocomial Infection Control Consortium (INICC), from June 2006–April 2008. The study was divided into a 3-month baseline period and a follow-up period. A multidimensional HH approach was introduced, which included administrative support, supplies availability, education and training, reminders in the workplace, process surveillance, and performance feedback. Health care workers were observed for HH practices in each intensive care unit during randomly selected 30-minute periods.

Results: We recorded 4,837 opportunities for HH, with an overall HH compliance that increased from 27%–58% ($P < .01$). Multivariate analysis showed that some variables were associated with poor HH compliance: men versus women (49% vs 38%, $P < .001$), nurses versus doctors (55% vs 48%, $P < .02$), among others.

Conclusions: With the implementation of the INICC approach, adherence to HH was significantly increased. Programs should be aimed at improving HH in variables found to be predictors of poor HH compliance.

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Over more than a century ago, when the relation between improved hand antisepsis and reduced mortality from puerperal sepsis was being studied by Semmelweis,¹ it was shown that appropriate hand hygiene (HH) before patient contact was a

fundamental tool for infection prevention. Different studies have reported that an improved HH practice was associated with the reduction of antimicrobial resistance and rates of health care-associated infection (HAI).²⁻⁴

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Additional information: Every hospital's institutional review board agreed to the study protocol, and patient confidentiality was protected by codifying

the recorded information, making it only identifiable to the infection control team.

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The threat to patient safety posed by HAIs includes morbidity and mortality.⁵ As shown in the mainstream scientific literature, most studies addressing HAIs have been conducted in developed countries.⁶ In 2002, the International Nosocomial Infection Control Consortium (INICC) began to apply standardized definitions and methods, contributing to systematically measuring and analyzing HAI rates worldwide.^{7–11}

HH serves a crucial role in preventing cross transmission of HAIs, and successful interventions to improve HH have been reported both from developed countries¹² and limited-resource countries.^{3,13,14} From the 1980s, investigators have analyzed the effectiveness of interventions to improve HH, including the impact of supplies availability,¹⁵ the use of reminders and posters at the workplace,¹⁶ the use of monitoring and performance feedback,¹⁷ administrative support,¹⁸ the introduction of alcohol-based hand rub (AHR),¹⁹ and the effectiveness of education.^{20,21} In 1997, Larson et al¹⁸ explicitly referred to a multidimensional approach that considered several interventions in a study conducted in the United States. Likewise, Rosenthal et al implemented programs in Argentina combining administrative support, supplies availability, education and training, process surveillance, and performance feedback, which produced a sustained improvement in HH compliance,¹⁴ with a reduction in HAI rates.³

In 2002, the Centers for Disease Control and Prevention published a HH guideline.²² With a view to promote HH from a global angle, in 2005 the World Health Organization (WHO) launched the program Clean Care is Safer Care.²³ In 2009, the WHO published its guidelines presenting a compilation of previously published data, a new formulation for AHR products, among several other recommendations.⁴

This is the first multicentric study from Brazil that aims to establish the baseline HH compliance rate by health care workers (HCWs) before patient contact, to analyze risk factors for poor adherence, and to implement and evaluate the impact of an INICC multidimensional hand hygiene approach (IMHHA) in 4 intensive care units (ICU) in 4 hospitals in 3 cities in Brazil. The approach includes the following elements: administrative support, supplies availability, education and training, reminders in the workplace, process surveillance, and performance feedback.

MATERIAL AND METHODS

Background on the INICC

The INICC is an international, nonprofit, open, multicentric HAI surveillance network with a methodology based on the Centers for Disease Control and Prevention's National Healthcare Safety Network in the United States.²⁴ The INICC is the first research network established to measure and control HAIs in hospitals worldwide through the analysis of standardized data collected on a voluntary basis by its member hospitals. Gaining new members since its international inception in 2002, the INICC is now composed of nearly 1,000 hospitals in 200 cities in 50 countries in Latin America, Asia, Africa, the Middle East, and Europe and has become the only source of aggregate standardized international data on the epidemiology of HAI worldwide.¹¹

Study setting

This study was conducted in 4 adult ICUs in 4 INICC member hospitals from Brazil, which were successively incorporated into the study over a period of 3 years.

Each hospital has an infection control team (ICT) composed of at least 1 infection control practitioner and 1 physician. The HCW in

charge of process surveillance at each hospital has at least 2 years of infection control experience.

The study protocol was approved by the institutional review board at each hospital.

Study design

An observational, prospective, cohort, interventional, before-and-after, multicentric study was conducted from June 2006–April 2008. The study was divided into 2 periods: a baseline period and a follow-up period. The baseline period for HH compliance included episodes documented at each hospital during their first 3 months of participation, and the follow-up period included episodes following the fourth month of participation. Each ICU started to participate in the study at different times and therefore have different lengths of follow-up (5–24 months). For comparison of compliance rates, the ICUs were aligned independently of the date at which they started its participation in the study.

IMHHA

The IMHHA is implemented at each hospital from the beginning of their participation in the INICC. The approach includes the following 6 components: administrative support, supplies availability, education and training, reminders in the workplace, process surveillance, and performance feedback. Although the components are presented individually, they are interactive elements that must concur for the effective implementation of any multidimensional approach.

Administrative support

Hospital administrators of the participating hospitals agreed and committed to the study, attended infection control meetings to discuss study findings, and allocated supplies of HH products.

Supplies availability

During the study period, AHRs bottles were available at the ICUs' entrances, nursing stations, and near the site of patient care (individual patient room entrances, at bedside tables, and on the feet of patient beds). Sinks with water supply, soap, and paper towels were available at the ICUs' entrances, nursing stations, and common areas of the ICUs.

Education and training

In the ICUs, the ICT members provided 30-minute education sessions to HCWs in each work shift, at the beginning of the study period and periodically (every month, every 2 months, and every 6 months, depending on the ICU) during the follow-up period. Education included basic information about indications of HH and the correct procedures and technique for HH.

Reminders in the workplace

Poster reminders were displayed all around the hospital settings (ie, hospital entrance, corridors, ICT office, ICU entrances, nursing stations, beside each sink, and beside each AHR bottle). They included simple instructions on HH performance, in line with the contents of the education and training program.

Process surveillance

Process surveillance of HH practices consisted of the registration of potential opportunities for HH⁴ and the actual number of HH episodes, either with water and soap or AHR. HCWs' HH practice was directly monitored by a member of the ICT following a standardized protocol and included completing HH process

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