Infection Control Practice in the Operating Room: Staff Adherence to Existing Policies in a Developing Country

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Abstract

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Introduction

Infection control interventions are important for containing surgery-related infections. For this reason, the modern operating room (OR) should have well-developed infection control policies. The efficacy of these policies depends on how well the OR staff adhere to them. There is a lack of available data documenting adherence to infection control policies.

Objective: To evaluate OR staff adherence to existing infection control policies in Jamaica.

Methods: We administered a questionnaire to all OR staff to assess their training, knowledge of local infection control protocols, and practice with regard to 8 randomly selected guidelines. Adherence to each guideline was rated with fixed-choice items on a 4-point Likert scale. The sum of points determined the adherence score. Two respondent groups were defined: adherent (score > 26) and nonadherent (score ≤ 26). We evaluated the relationship between respondent group and age, sex, occupational rank, and time since completion of basic medical training. We used $\chi^2$ and Fisher exact tests to assess associations and t tests to compare means between variables of interest.

Results: The sample comprised 132 participants (90 physicians and 42 nurses) with a mean age of 36 (standard deviation ± 9.5) years. Overall, 40.1% were adherent to existing protocols. There was no significant association between the distribution of adherence scores and sex (p = 0.319), time since completion of basic training (p = 0.595), occupational rank (p = 0.461), or age (p = 0.949).

Overall, 19% felt their knowledge of infection control practices was inadequate. Those with working knowledge of infection control practices attained it mostly through informal communication (80.4%) and self-directed research (62.6%).

Conclusion: New approaches to the problem of nonadherence to infection control guidelines are needed in the Caribbean. Several unique cultural, financial, and environmental factors influence adherence in this region, in contrast to conditions in developed countries.

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which adherence would be unacceptable. As there were no existing standards, we participated in a consensus meeting to define a clinically relevant value for an unacceptable score. It was agreed that this would be determined by administering the questionnaire to a group of 6 attending surgeons, anesthetists, and charge nurses outside of the study sample. Their mean score was used to define the minimum acceptable adherence score. We defined 2 respondent groups: adherent (score > 26) and nonadherent (score ≤ 26).

We evaluated the relationship between respondent group age, sex, occupational rank, and time since completion of basic medical training. We used Statistical Package for the Social Sciences (SPSS) version 12.0 (SPSS, Inc; Chicago, IL) and Stata version 10 (Statacorp Inc; College Station, TX) for data analysis. Descriptive statistics were generated as appropriate. We assessed associations with χ² and Fisher exact tests and compared means between variables of interest with t tests.

Results

Of 179 staff members performing regular duties in the OR, 132 (73.7%) participated in the study: 90 physicians and 42 nurses with an average age of 36 (standard deviation [SD] = 9.5) years. There was a preponderance of women (58%).

Almost 70% of respondents were between the ages of 21 and 39 years. Thirty-eight respondents were age 20-29 years, 52 were age 30-39 years, 25 were age 40-49 years, and 17 were 50 years of age or older.

Regarding occupational rank, 48 (36.4%) participants were at the grade of consultant/attending physician or charge nurse. The remaining 84 (63.6%) were at the resident/registered nurse grade.

With respect to training, 85 (64.4%) participants had completed basic medical training within the last 10 years. Of those remaining, 13 had completed basic medical training within the last 11–15 years, 15 within the last 16–20 years, and 19 respondents had completed basic medical training for at least 20 years.

Although there were established infection control policies in this OR, at the time of this study there were no structured programs to educate OR staff about these protocols. In fact, 19% of OR staff reported

<table>
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<tr>
<th>Table 1. Evaluation of clinical practice of health care workers at the University Hospital of the West Indies</th>
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<tbody>
<tr>
<td><strong>Question</strong></td>
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<tr>
<td>1. Do you wash hands after contact with body fluids?</td>
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<tr>
<td>Always</td>
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<tr>
<td>Usually</td>
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<td>Occasionally</td>
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<td>Never</td>
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<td>2. Do you wear gloves when touching body fluids?</td>
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<td>Always</td>
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<tr>
<td>Usually</td>
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<td>Occasionally</td>
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<td>Never</td>
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<td>No response/don’t know</td>
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<td>3. Do you wear gloves when touching mucous membranes or nonintact skin?</td>
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<td>Always</td>
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<td>Occasionally</td>
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<td>Never</td>
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<td>No response/don’t know</td>
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<td>4. Do you routinely wear a face mask to cover your mouth and nose?</td>
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<td>Always</td>
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<td>Usually</td>
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<td>Occasionally</td>
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<td>No response/don’t know</td>
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<td>5. Do you wear eye protection during procedures and patient-care activities that may generate splashes or sprays of body fluids?</td>
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<td>Always</td>
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<tr>
<td>Usually</td>
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<td>Occasionally</td>
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<td>Never</td>
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<tr>
<td>No response/don’t know</td>
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<td>6. Do you wear a gown during procedures and patient-care activities that may generate splashes or sprays of body fluids?</td>
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<td>Always</td>
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<tr>
<td>Usually</td>
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<td>Never</td>
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<td>No response/don’t know</td>
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<td>7. Do you change into outer clothes when leaving the operating room and put on a new set of theatre attire upon your return?</td>
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<td>Always</td>
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<td>Usually</td>
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<td>Never</td>
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<tr>
<td>No response/don’t know</td>
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<td>8. Do you recap needles after use?</td>
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<td>Usually</td>
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<td>Occasionally</td>
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<td>Never</td>
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<tr>
<td>No response/don’t know</td>
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<td>Adherence score</td>
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that they had never received instruction about any infection control measures and that they felt their knowledge of infection control practices was inadequate. The remaining 81% of respondents thought that they possessed a working knowledge of current infection control recommendations, having attained this information through informal communication with colleagues (80.4%), self-directed research (62.6%), signs posted around the hospital (38.3%), and formal courses (34.6).

The mean overall adherence score for all respondents was 25.1 (SD, ± 3.6; range, 15-32). According to the predetermined categories, only 40.1% (53) of the respondents adhered to established protocols. There was no significant association between the distribution of adherence score and sex (p = 0.319), time since completion of basic medical training (p = 0.595), occupational rank (p = 0.461), or age (p = 0.949).

Discussion

Only 40% of the OR staff in this sample adhered to existing infection control guidelines. This is an important finding because surgical-site infections are significant contributors to perioperative morbidity and mortality. They are the most common type of nosocomial infection, with international meta-analyses estimating a pooled prevalence of 5.6 per 100 surgical procedures. Health care-associated infections prolong hospitalization and increase the cost of health care delivery. Interventions to improve adherence to infection control policies could reduce the prevalence of these infections, allowing more resources to be allocated to other areas of health care delivery. This is especially meaningful in the Caribbean, where most health care delivery systems are underfunded and operate with limited resources.

A review of literature published up to January 2012 revealed a paucity of data about the incidence of health care-associated infections in Caribbean nations. The best available data are estimates extrapolated from non-Caribbean developing nations. Allegranzi et al. performed a systematic meta-analysis of published data regarding health care-associated infections in developing countries from 1995 to 2008. Using pooled data, they estimated that the prevalence of health care-associated infection was significantly higher (95% confidence interval, 12.6-18.9) in developing nations compared to developed countries (15.5 vs 8.5 per 100 patients). Surgical-site infections were the most common infections in hospitals (pooled cumulative incidence 5.6/100 surgical procedures), with significantly higher rates in the developing world (11.8% vs 5.2%) than in developed countries.

This widely recognized problem prompted the World Health Organization’s World Alliance for Patient Safety to launch its Global Patient Safety Challenge in 2007. At the 27th annual Pan American Sanitary Conference (2007), health ministers from 14 anglophone Caribbean countries convened in Washington, DC, for the first Global Safety Challenge to discuss improvements in infection control. The exercise culminated in a regional agreement to take steps to reduce health care-associated infections, with an emphasis on prevention through adherence to standard guidelines. Our finding of 40% adherence at the study facility 4 years after Jamaica participated in the Global Patient Safety Challenge highlights the magnitude of the problem.

Although the nature of our study precludes conclusions about the reasons for this failure, the fact that there were low adherence scores across all strata (groups defined by age, sex, occupational rank, or time since completion of basic medical training) suggests a need to revisit the general method for approaching the problem. An understanding of the existing barriers to adherence in this setting is necessary.

Availability of Supplies

With only 4% of Jamaica’s national budget allocated to health care and no other source of external funding, OR supplies are scarce. These include basic supplies that may be taken for granted in developed nations, such as functional hand-washing facilities, a consistent water supply, disinfecting hand lotions, sterile gowns, properly fitting gloves, waterproof aprons, and safety goggles. To reduce surgical-site infections, these supplies should always be available to OR staff; only then can a culture of habitual use develop. Availability of supplies should be a priority for policy makers.
Surveillance and Enforcement

Because resources are quite limited in Jamaica, evaluating the practice of OR staff has not been a high priority. This is not ideal because without effective monitoring, protocol breaches go undetected and corrective measures cannot be instituted.

Financial constraints do not readily allow the use of technologic aids such as closed-circuit cameras in the OR. One option to improve adherence in this setting may be to form teams dedicated to monitoring adherence to local guidelines. The role of disciplinary action is controversial. In any event, knowledge of ongoing monitoring may be sufficient to bring about behavioral modification among OR staff, even without the immediate threat of sanctions.

The paucity of available data regarding surgical-site infections in Jamaica is indicative of the wider problem of ineffective surveillance and reporting systems. Without these, the problem will continue to be underestimated and any need for change trivialized. Effective strategies for surveillance and reporting for health care-associated infections are required to overcome this barrier.

Health Care Culture

Although they accomplish much good work, health care workers in Jamaica are often expected to provide patient care with scarce supplies and minimal support services. Most patients have no access to care beyond what the government health care delivery systems can offer, since most of the Jamaican population do not have adequate health insurance. Therefore, most health care workers make a conscious decision to treat patients despite the limitations of the health care delivery systems. Eventually, this became the subjective norm across all components of the health care system, affecting adherence to infection control guidelines.

This barrier is difficult to overcome because it requires a major change in the health care culture, primarily through targeted educational campaigns. Many have suggested relaxing local protocols, seeking partnerships with clinicians in developed countries, introducing legislation for mandatory health insurance, and reversing local policies for free health care. Although these strategies may all contribute to change, they must still be accompanied by a fundamental change in the health care culture.

Training in Best Practices for the Operating Room

This study has revealed a paucity of educational campaigns that have resulted in 19% of OR staff feeling inadequate in their knowledge of infection control practices. Although it is true that improvements in education and knowledge alone do not always translate to sustained improvement in adherence, a complete absence of education is inappropriate. It is only through knowledge of infection control best practices that OR staff can begin to change the health care culture in this setting. This can be achieved by implementing educational campaigns or distributing instructive material. Another strategy that may increase adherence is required certification in infection control best practices before placement in the OR.

It is interesting that our findings mirror those of adherence studies conducted in developed nations where there is wide variation in adherence to standard infection control practice guidelines. Despite abundant supplies, certification requirements, and better monitoring in developed countries, there were only incremental improvements in performance, suggesting that this is a complex, multifactorial problem.

Study Limitations

There are several limitations to our study. First, it was carried out at a single institution. A nationwide study would have been more instructive.

Second, we used the participants’ responses to define their adherence. In these types of questionnaire surveys, many participants tend to overestimate their adherence, reporting what they perceive to be ideal responses. However, even if adherence was over-reported, the finding that OR staff believe they are not generally adherent to standard infection control practices is important. One way to overcome this weakness would have been to have an independent investigator observe the participants’ practices without the latter’s knowledge.

We also acknowledge that the method of defining adherence may have introduced a degree of bias. Although 100% adherence to existing guidelines is ideal, this is not a realistic expectation: there are no reports of 100% adherence in the medical literature. It is difficult to determine the degree of nonadherence that is tolerable, because there are no existing standards to determine a level of adherence that meets expectations for clinical practice.

Conclusion

Despite the proven efficacy of infection control practices for preventing and controlling health care-associated infections, we found that only 40% of OR staff adhered to these protocols. It is time to rethink our approach to this problem in the Caribbean, where several unique cultural, financial, and environmental factors that influence adherence differ from conditions in developed countries.

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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References

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