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Environmental cleaning resources and activities in Canadian acute care hospitals

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Background: Environmental cleaning interventions have increased cleaning effectiveness and reduced antibiotic-resistant organisms in hospitals. This study examined cleaning in Canadian acute care hospitals with the goal of developing strategies to improve cleaning and reduce antibiotic-resistant organism rates.

Methods: Managers most responsible for environmental services (EVS) completed an extensive online survey that assessed EVS resources and cleaning practices.

Results: The response rate was 50.5%; 96 surveys were completed, representing 103 of 204 hospitals. Whereas 86.3% (82/95) of managers responsible for EVS reported their staff was adequately trained and 76.0% (73/96) that supplies and equipment budgets were sufficient, only 46.9% (45/96) reported that EVS had enough personnel to satisfactorily clean their hospital. A substantial minority (36.8%, 35/95) of EVS departments did not audit the cleaning of medical surgical patient rooms on at least a monthly basis. Cleaning audits of medical surgical patient rooms frequently included environmental marking methods in only one third (33.3%, 31/93) of hospitals and frequently included the measurement of residual bio-burden in only 13.8% (13/94).

Conclusion: There was a general need for increased and improved auditing of environmental cleaning in Canadian hospitals, and there were perceived EVS staffing deficits in the majority of hospitals.

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Antibiotic-resistant organisms (AROs) are endemic in Canadian acute care hospitals.^{1,2} There is considerable evidence that environmental contamination by pathogens in hospitals is associated with patients contracting infections.^{3–8} In studies that assessed environmental cleaning, significant cleaning deficits were found, and only half of designated surfaces in patient rooms were being effectively cleaned.^{9–11} Environmental cleaning interventions and enhancements have reduced ARO levels in acute care hospitals.^{3,12–15}

The purpose of this study was to examine the state of environmental cleaning resources and practices in Canadian acute care hospitals. This study will provide a benchmark of environmental cleaning practices in Canadian acute care hospitals. The study should provide new strategies for improving the

provision of environmental services and help reduce ARO rates resulting in reduced patient morbidity, mortality, and health care costs.

METHODS

The environmental cleaning resources and activities of environmental services (EVS) in Canadian medium to large acute care hospitals were quantitatively assessed as part of the Canadian Hospitals Environmental Services Studies (CHESS). In 2012 and the first half of 2013, the manager most responsible for EVS completed an online survey that assessed the cleaning resources and activities in their hospital in 2011. The CHESS project also included a separate online survey that assessed the working relationships of infection prevention and control programs and EVS in acute care hospitals.¹⁶ The CHESS project was reviewed and approved by the Queen's University Research Ethics Board.

The EVS survey was developed in conjunction with an expert steering committee composed of experts in infection prevention

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and control and environmental services. The survey was pilot tested by 6 managers who were responsible for EVS in Canadian acute care hospitals. There were French and English versions of the survey. The survey assessed EVS human, equipment, supply, and work space resources and cleaning and disinfection policies and practices. Respondents quantitatively rated the adequacy of staffing levels, the EVS staff training, and the supplies and equipment budget. Respondent addresses were obtained from the Canadian Hospital Association database, and respondents were contacted by mail. Second and third invitations to participate were mailed to nonresponders. Respondents were also contacted by e-mail when email addresses were available. Descriptive statistics were predominately used to present the data. Data were analyzed with StatView Version 5.0 (SAS Institute, Cary, NC).

RESULTS

The response rate was 50.5%; 96 surveys were completed, representing 103 of 204 facilities. Three surveys were received from larger health organizations each representing 2 hospitals, and 1 survey was completed on behalf of 5 hospitals. Respondents were managers responsible for EVS, also called Housekeeping or Support Services, at their hospital. Respondents' mean environmental cleaning experience was 17.3 (standard deviation [SD], 10.3) years. 43.8% (42/96) of respondents were certified in environmental cleaning, holding Canadian certificates such as Certificate in Environmental Management and Professional Healthcare Housekeeping certificate or had similar qualifications. Two thirds (65.6%, 63/96) of managers responsible for EVS held academic diplomas or degrees. Two thirds (67.4%, 64/95) were also responsible for departments other than EVS. Of respondents responsible for other departments, 65.7% (SD, 24.7) of their time was allocated to EVS.

Human resources

Most (92.7%, 89/96) hospitals had EVS managers and supervisors employed directly by the hospital, and 24.0% (23/96) had external contracted EVS managers or supervisors. 39.3% (SD, 41.3) of hospital-employed EVS managers and supervisors were certified, and 46.3% (SD, 42.0) of EVS external contracted managers and supervisors were certified. Most (93.8%, 90/96) hospitals had EVS cleaners employed directly by the hospital, and 15.6% (15/96) had external contracted EVS cleaners. A minority (46.9%, 45/96) of respondents reported that EVS had enough personnel to satisfactorily clean their hospital to the required standards, of which only 5.2% (5/96) strongly agreed there were sufficient EVS personnel. In hospitals in which the manager responsible for EVS agreed there were sufficient staff, there was a mean of 4.0 (SD, 1.4) beds per full-time equivalent cleaner versus 5.0 (SD, 2.3) beds per full-time equivalent cleaner in hospitals that did not report sufficient staff, and this difference was significant ($t = 2.4, P = .02$). This calculation was based on full-time equivalent cleaners and total beds for the entire facility.

All but 1 EVS department had introductory training programs for new personnel with a mean duration of 44.7 (SD, 32.3) hours with a median of 37.5 and a range of 4 to 186. Infection control, basic cleaning techniques, use of personal protective equipment, and hand hygiene were the most frequently covered topics in introductory training programs, and customer service, personal hygiene, and dealing with spillages were covered the least (Table 1). 16.7% (16/96) of EVS departments did not have an ongoing training and professional development program. Infection control, hand hygiene, and basic cleaning techniques were the most frequently covered topics in ongoing training programs, and areas of

Table 1

Topics covered in environmental services introductory and ongoing training programs

Topics covered	Introductory training programs (n = 95), %	Ongoing training programs (n = 80), %
Infection control	100	93.8
Basic cleaning techniques	100	90.0
Hand hygiene	97.9	91.3
Use of personal protective equipment	97.9	87.5
Health and safety policies	94.7	87.5
Waste disposal	94.7	73.8
Cleaning and storage of equipment	92.6	70.0
Areas of responsibility	90.4	65.0
Customer service	80.9	73.8
Personal hygiene	79.8	60.0
Dealing with spillages	71.3	72.5

responsibility and personal hygiene were covered the least (Table 1). Almost all (94/96) EVS departments kept records of staff participation in training and education activities. 57.3% (55/96) of EVS departments reviewed their training programs often or always. 82.0% (78/94) of managers responsible for EVS reported managers and supervisors who were hospital employees had received the training necessary to perform their duties satisfactorily and that 72.7% (16/22) of external contracted managers and supervisors had received the necessary training. 85.9% (79/92) of respondents reported hospital employed cleaning staff had received the training necessary to perform their duties satisfactorily and that 73.3% (11/15) of external contracted cleaning staff had received the necessary training. 86.3% (82/95) of respondents reported that, overall, personnel performing EVS functions in their hospital were adequately trained to satisfactorily clean the hospital to the required standards.

Equipment, supply, and work space resources

Almost all respondents (96.8%, 92/95) reported that their preferred hospital-grade licensed cleaning and disinfection products were used in their hospital. Hydrogen peroxide-based (71.9%, 69/96) and quaternary ammonium (63.5%, 61/96) compounds were the most frequently used disinfectants for daily cleaning, and phenolics (3.1%, 3/96) were least often used. Almost all respondents (96.8%, 92/95) reported their hospital used their preferred cleaning and disinfection equipment. Microfiber cleaning cloths were frequently used by 61.1% (58/95) of hospitals. For cleaning the average medical-surgical patient room, microfiber cleaning cloths were used in 58.3% (56/96) of hospitals followed by rags in 21.9% (21/96), manufactured cloths with edges in 16.7% (16/96), and disposable wipers in 3.1% (3/96). A minority (37.5%, 36/96) of hospitals frequently used cleaning cloths that were color coded for different applications. Vacuum cleaners with high-efficiency particulate air filtration were frequently used in clinical areas in 71.3% (67/94) of hospitals. Toilet bowl brushes were used in more than 1 patient washroom in 45.8% (44/96) of hospitals, dedicated to 1 washroom in 34.4% (33/96), discarded after each use in 10.4% (10/96), and were not used in 9.4% (9/96). It was reported there were sufficient supplies of personal protective equipment for cleaning staff in almost all hospitals (97.9%, 94/96). There were clean supply rooms close to patient care areas in 89.6% (86/96) of hospitals, and there were sufficient housekeeping rooms and closets in a slim majority (55.2%, 53/96). Three quarters (76.0%, 73/96) of respondents reported their supplies and equipment budget was sufficient to clean and disinfect their hospital to standards.

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