



Hospital outpatient clinics as a potential hazard for healthcare associated infections



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Summary Healthcare acquired infections are no longer confined to the hospital environment. Recently, many reported outbreaks have been linked to outpatient settings and attributed to non-adherence to recommended infection-prevention procedures. This study was divided into two parts: The first is a descriptive cross-sectional part, to assess the healthcare personnel's knowledge and compliance with Standard Precautions (SP). The second is an intervention part to assess the role of health education on reducing the level of environmental and reusable medical equipment bacterial contamination. Assessment of the doctors' and nurses' knowledge and compliance with SP was performed using a self-administered questionnaire. Assessment of environmental cleaning (EC) and reusable medical equipment disinfection has been performed using aseptic swabbing method. The extent of any growth was recorded according to the suggested standards: (A) Presence of indicator organisms, with the proposed standard being <1 cfu/cm². These include *Staphylococcus aureus* (including methicillin-resistant *Staphylococcus aureus*, MRSA), *Enterococci*, including vancomycin-resistant *Enterococci* (VRE) and various multidrug-resistant Gram-negative bacilli. (B) Aerobic colony count, the suggested standard is <5 cfu/cm². The effect of health education intervention on cleaning and disinfection had been analyzed by comparing the difference in cleaning level before and after interventional education. Good knowledge and compliance scores were found in more than 50% of participants. Primary screening found poor EC and equipment disinfection as 67% and 83.3% of stethoscopes and ultrasound transducers, respectively, were contaminated with indicator organisms. For all indicator organisms, a significant reduction was detected after

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intervention ($p = 0.00$). Prevalence of MRSA was 38.9% and 16.7%, of the total *S. aureus* isolates, before and after intervention, respectively. Although 27.8% of the total *Enterococcus* isolates were VRE before intervention, no VRE isolates were detected after intervention. These differences were significant. Development and monitoring of the implementation of infection prevention policies and training of HCP is recommended.

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Introduction

Developing countries have reported to have up to 20 times the risk of healthcare acquired infections (HCAIs) compared with developed countries [1]. Healthcare acquired infections are no longer confined to the hospital environment [2]. Outpatient care is defined as care provided in facilities where patients do not stay overnight. Recently, most patient encounters are with outpatients. Thus, infection prevention and control in outpatient settings is critical [2].

Many reported outbreaks have been linked to outpatient settings and attributed to non-adherence to recommended infection-prevention procedures [3]. The main mode of transmission of infection is healthcare personnel (HCP) [4]. Consistent with these data, ongoing education and training of HCP on the basic principles and practices for infection control (IC), hygiene and environmental cleaning (EC) are critical [5]. About one-third of all HCAIs may be prevented by adequate cleaning of medical equipment [6]. Because the equipment used in non-critical settings, such as outpatient clinics, is less likely to have standard cleaning protocols than the equipment used in the critical setting, it is more likely to carry a large number of microorganisms.

Infections with antibiotic-resistant bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin intermediate *S. aureus* (VISA), vancomycin-resistant *Enterococcus* (VRE), *C. difficile*, and multiple-resistant Gram-negative bacteria are well known hazards of inpatient care [7]. Recently, the rapid emergence and high prevalence of community-associated infections caused by resistant microorganisms such as *community acquired-MRSA*, VRE and *C. difficile* have been recognized in many parts of the world. These organisms have the potential to cause serious infections among patients without known risk factors. This might make outpatient clinics potential reservoirs of those pathogens [4].

This study aimed to assess the potential risk of outpatient clinics at Fayoum University Hospital (FUH) toward the community via a systematic assessment of outpatient HCP's knowledge and compliance with Standard Precautions (SP), assessment of EC and reusable medical equipment disinfection and evaluation of the role of health education (HE) intervention on the improvement of environmental cleaning and equipment disinfection.

Subjects and methods

Study design

This study was divided into two parts: The first was a descriptive cross-sectional part, to assess HCP's knowledge and compliance with SP. The second was an intervention part to assess the role of health educational activity on reducing the level of environmental and reusable medical equipment bacterial contamination.

Study setting

This study was based at the outpatient clinics in FUH. FUH is a 245-bed teaching hospital at Fayoum Governorate (population is approximately 3 million). The average number of patients visiting these outpatient clinics is approximately 13,000/month.

Participants

Full-time medical doctors and nurses on duty at one of the outpatient clinics at the time of the visit were included in the study. Participants who agreed to participate provided their verbal informed consent. Final data analysis did not include incomplete questionnaires. Thirty-four doctors and 31 nurses were included in the study.

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