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Research

Teaching the World Health Organization's How to Handrub and Five Moments for Hand Hygiene in a health care delivery course at a new school of pharmacy

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Abstract

Objective: To implement and evaluate instruction of hand rubbing with alcohol-based products using the World Health Organization (WHO) guidelines and indications.

Design: Newly matriculated P1 students were required to attend a 75-minute class during which an instructor presented hand hygiene in the context of professionalism and the incidence of health care-associated infections and community-acquired antimicrobial-resistant infections in pharmacy practice settings. Students then practiced the eight-step World Health Organization (WHO) method using a WHO infographic and alcohol-based hand sanitizer and watched a *New England Journal of Medicine* video to reinforce skill instruction and to introduce the WHO indications for hand hygiene.

Assessment: Individual hand rubbing skill was assessed by individual observation using a ten-point rubric. Knowledge was tested by exam. Change in student attitudes and motivation to perform hand hygiene were measured by survey. All students ($n = 77$) demonstrated mastery of WHO hand rubbing. Correct answers to exam questions ranged from 83% to 100% per question. Student attitudes and motivation to perform hand hygiene increased significantly.

Conclusions: Mastery of WHO hand rubbing can be achieved with limited class time. This skill may protect both students and patients from health care-associated infections and community-acquired infections while providing a strong visual demonstration of professionalism to patients and other providers.

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Keywords: Hand hygiene; Health care-associated infections; Health care delivery; Professionalism

Introduction

Health care-associated infections (HAIs) are one of the top ten leading causes of death in the US.¹ Hand hygiene is the single most effective method for preventing transmission.² Yet, the World Health Organization (WHO) has estimated the health care worker compliance with hand-hygiene recommendations to be only 38.7%.³ Many times, health care workers

lack the time, knowledge of appropriate technique, or basic training of proper hand-hygiene recommendations to ensure adequate compliance.⁴ On rotation, pharmacy students may experience low- and medium-risk opportunities for hand hygiene based on the Fulkerson Risk Scale (e.g., touching patient bedrails and tables or shaking hands with patients).^{5,6} Students may also round with residents and physicians, with associated risk of patient cross-transmission in the hospital setting.⁵ Yet, to our knowledge, few publications have addressed instruction and assessment methods for formal hand-hygiene instruction in schools of pharmacy.

The Accreditation Council on Pharmaceutical Education (ACPE) tasks pharmacy educators to teach disease

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prevention in cooperation with patients and other members of an inter-professional health team,⁷ and the Center for Advancement of Pharmacy Education (CAPE) outcomes specify learning outcomes related to the selection and implementation of strategies to prevent or detect diseases in target populations.⁸ Pharmacists and pharmacy faculty are likely well aware that one of the most important factors in disease prevention in institutional settings is prevention of microbe transmission.⁹ Decreased transmission will result in less patient morbidity and mortality and decreased health care costs.¹ Yet, formal hand-hygiene skills training (for example, using the WHO Five Moments for Hand Hygiene using alcohol-based preparations^{10–12}) does not appear in the CAPE or ACPE recommendations. As a result, such training is unlikely to be the focus of instruction and assessment. In fact, we were unable to identify articles in the peer-reviewed literature that specifically addressed hand-hygiene education in schools of pharmacy.

Our goal was to introduce newly matriculated P1 students to the knowledge and skills of the World Health Organization's Five Moments for Hand Hygiene and Hand Rubbing (with alcohol-based preparations)^{10–12} in the context of required instruction in professionalism and health care delivery. In this article, we describe the design, implementation, and assessment of a P1 first-semester required course. We share outcomes data for student self-reported knowledge, attitudes, and motivation to perform hand hygiene before and after implementation, exam results, and hand rubbing skills assessment based on a ten-point rubric we created for visual assessment.

Design

In a 75-minute class period of the required course, Health Care Delivery, newly matriculated P1 students were introduced to the prevalence, morbidity, and mortality associated with health care-associated infections and the role of hand hygiene in prevention. The Socratic method was used to engage students in exploring the relationship between hand hygiene and the characteristics of a profession, health care delivery settings and provider roles, and the expected incidence of health care-associated infections and community-acquired antimicrobial-resistant infections in experiential education settings.¹³ Students then practiced the eight steps of hand rubbing with alcohol-based gel using the WHO graphic instructions: *How to Handrub?*¹⁴ (Fig. 1) and *Your Five Moments for Hand Hygiene*.¹⁵ Finally, students watched a 14-minute *New England Journal of Medicine (NEJM)* video¹⁶ that included a review of adherence to hand hygiene, associations with health care-associated infections, and a review of the WHO hand rubbing method and indications. (The companion *NEJM* article was provided on Blackboard for reference review.¹⁷) Students practiced again in the class and completed a paper copy of the assessment survey. Students were then assigned to present individually during

office hours over the following two weeks mastery of the method.

Instruction incorporated the three levels each of Bloom's and Frank's taxonomies of learning (Table 1).^{18,19} Students gained *knowledge* by identifying the indications for performing hand hygiene. They demonstrated *ability* by performing all steps in hand rubbing with alcohol-based preparations in 20–30 seconds, and their *comprehension* was expressed by both mastering the ability and by confident responses to survey questions about knowledge, attitudes, and motivation to perform hand hygiene (Table 4).¹⁹

Instructional environment

Our student population is predominantly young, Caucasian, and evenly balanced by gender (Table 2). We offer only a four-year Doctor of Pharmacy and residencies. Most graduates practice in community pharmacy settings after graduation.

Expected outcomes and learning objectives

After completion of the instructional module, students are expected to have the ability to perform the Five Moments for Hand Hygiene in 30 seconds or less and to demonstrate knowledge of: why hand hygiene by pharmacists is important, hand hygiene indications, and why hand hygiene is a critical component of health professional behavior. Knowledge, attitudes, and motivation to perform hand hygiene were assessed using a two-page pre-/post-survey.

Survey items addressed knowledge, attitudes, and motivation to perform hand hygiene as well as past experience with hand-hygiene training. The survey was modeled after the one used by the Pharmacy Quality Alliance to evaluate the Educating Pharmacists and Pharmacy Students to Improve Quality (EPIQ) assessment survey.²⁰

Evaluation and assessment

Assessments included (1) a written exam of hand-hygiene indications and rationale, (2) teaching assistant observation of individual student skill in performing the seven moments for hand hygiene in 20–30 seconds (Fig. 2), and (3) an anonymous survey of 15 questions with a Likert scale response set self-administered during class time at the end of instruction.

Survey items and responses appear in Table 4. For each survey item, students simultaneously assessed pre-module/baseline and post-module/final scores of their knowledge of and attitudes toward hand hygiene in pharmacy practice.

A ten-item rubric (Fig. 2) was developed to assess technique and time to completion as specified in *How to Handrub?*¹⁴ The rubric was posted on Blackboard.

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