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Exploring the approaches used to teach concepts of hand hygiene to Australian medical students

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Abstract

Background: Recent audit data has revealed that the hand hygiene (HH) rates of Australian medical students is suboptimal. It has been suggested that new approaches are needed to teach students about infection control. As a first step, we undertook a study to determine the current educational approaches used to teach Australian medical students about HH. Secondly, this study aimed to explore the perceived barriers and to explore what other teaching approaches could be used to improve the levels of knowledge and compliance.

Methods: A self-administered questionnaire was sent to the Dean of Medical Education at each of the medical schools in late 2012.

Results: Of the 19 medical schools in Australia, 17 agreed to participate. The most commonly reported approaches currently used to teach students about HH are skills stations (17/17) and case scenarios/lectures (15/17). Clinical practical exams (15/17) and competency checks (11/17) are mostly used to assess the HH practices of medical students. Participants nominated the following as barriers to improving HH compliance: negative role modelling by senior doctors, and negative attitudes of students. Practical exercises (15/17), online teaching (12/17) and reflection (12/17) were suggested as other useful approaches that could be used to teach these concepts.

Conclusion: Practical laboratory-based approaches were suggested as the most useful teaching and learning approach. Given the trend towards blended learning, universities may want to consider new HH teaching approaches that combine campus-based learning with online components and reflection. Early exposure and the continued reinforcement of HH concepts through the student's medical degree are essential.

Keywords

Education, hand hygiene, healthcare-associated infections, infection control, qualitative research

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Introduction

Despite the well documented benefits of hand hygiene (HH), compliance among health professionals remains suboptimal. This includes medical students (Feather et al, 2000; Paotong et al, 2003; Mann and Wood, 2006). Although the World Health Organization (WHO) has developed several guidelines, tools and educational materials to educate, observe and monitor HH amongst healthcare workers (Pittet et al, 2009; WHO, 2009) they are not specifically targeted at medical students. Perhaps not surprisingly recent audit data of HH compliance of Australian medical students reveals that rates are low at around 70% nationally (Hand Hygiene Australia, 2013). Past studies have suggested that these low rates may be associated with: (1) a lack of knowledge regarding the indications of HH (Feather et al, 2000; Mann and Wood, 2006; Duroy and Le Coutour, 2010; Graf et al, 2011,); (2) a high self-assessment of their HH compliance (Hunt et al, 2005; Graf et al 2011);

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and/or (3) the negative impact of role modelling by senior doctors (Feather et al, 2000; Roberto et al, 2011).

As future healthcare practitioners medical students have been shown to play important roles in reducing patient harm (Seiden et al, 2006). Previous studies have suggested that more attention needs to be paid to the hygiene training of medical students, as poor HH compliance amongst trained physicians probably has its roots in a failure to learn good HH behaviours at medical school (Feather et al, 2000; Fisher et al, 2010; Scheithauer et al, 2012). Of the few studies which have been undertaken, only one has previously explored how HH is actually taught in medical schools (O'Brien et al, 2009). The study surveyed 31 medical schools in the UK and Ireland and identified that multiple choice questions (MCQs) and objective structured clinical examinations (OSCEs) are the most commonly used methods of assessment. Lectures, case discussion and practical demonstrations were also considered to be useful by the vast majority (>90%) of their respondents (Deans of medical schools), followed by the use of online material (67%) and logbooks (60%). To the best of our knowledge there has not been a similar study conducted to examine the learning/teaching strategies used in Australia.

Our study aimed to determine the current educational approaches used to teach Australian medical students about HH, the perceived barriers impacting on the quality of teaching and to explore what other teaching approaches could be used to improve the levels of knowledge and compliance.

Methods

In Australia, there are 19 medical schools, which offer either undergraduate or postgraduate medical degrees. Of these, 11 deliver postgraduate programs only (4 to 5 years in length), five schools offer only undergraduate programmes (5 to 6 years), while the remaining four offer both types. In 2013, a total of 16,993 medical students graduated in Australia (Medical Deans Australia and New Zealand, 2013).

The study was undertaken by infection control/infectious diseases experts and academics involved with undergraduate medical school teaching at UNSW Australia. An invitation to participate was emailed to all of the Deans of Medical Education across Australia, along with the participant information sheet and survey. One university has two schools located in different Australian states, so each site was sent an invitation. Non-respondents were followed up by email.

A paper questionnaire was developed based on the previously validated questionnaire by O'Brien et al (2009). Our questionnaire covered the following areas of interest: (1) type of programme offered/number of enrolled medical students; (2) theoretical and practical infection control concepts taught and the years they are taught in; (3) teaching approaches utilised; (4) use of assessment/frequency of assessment; (5) attitudes regarding the usefulness of teaching approaches around HH; (6) perceived barriers associated with teaching HH concepts; (7) perceived attitudes of students towards the different teaching approaches and their impact on learning; and (8) attitudes towards future HH teaching approaches.

Analysis was performed using SPSS version 21 (SPSS Inc.). Descriptive statistics were calculated for all survey data. Ethics approval was sought and granted by the Human Research Ethics Advisory Panel at UNSW Australia.

Results

Of the 19 schools invited to participate, 17 agreed (90%). Most (16/17) reported that the topic of infection control and HH (theory/practical skills) is covered at least twice during the medical program. Skills stations, case scenarios, and lectures were reported to be the most commonly used teaching approaches. Videos and reflections were reported to be used in approximately half of the medical schools, while e-learning was the least used approach (Table 1).

With regard to using assessment as an HH teaching tool, 15 participants reported that their schools implemented clinical practical exams and 11 participants used competency checks (Table 1). Eleven schools reported that they assessed the students at least twice during their course (HH theory and practical skills), while a further six schools reported that they assessed students yearly around these topics.

Twelve participants agreed that there are a number of key issues negatively impacting the quality of HH teaching to medical students. Most felt that students are being exposed to negative role modeling especially by senior doctors in the hospitals. Others postulated that in recent times, there has been a negative shift in the attitudes of the students regarding the inclusion of these "topics" (i.e. HH and infection control) in their course. They also felt that the time devoted in the timetable to teaching these topics has been impeded. Despite these issues, participants were mostly satisfied with how the concepts of HH were taught in their schools. Interestingly, 13 participants rated the understanding of their medical students around HH concepts as 'high' to 'very high'. However, only eight respondents believed that their students are 'very' receptive to learning around HH, while a similar proportion disagreed with the statement that 'students' rate learning about HH as equivalent to learning about other core medical concepts'.

Five participants said that they wanted to increase the number of HH teaching/learning opportunities in their schools. They felt that students would benefit from earlier exposure to HH (theory/practical skills), more support/guidance in clinical placements through the use of role modelling, and the reinforcement of the concepts in a variety of clinical environments. Posting material online, using

Table 1. Current teaching and assessment approaches used in medical schools.

Current teaching approaches	No. (%)	Current assessment approaches	No. (%)
Case scenarios	15 (88.2)	MCQs	7 (41.2)
Lectures	15 (88.2)		
Videos	10 (58.8)	OSCEs	12 (70.6)
e-learning	6 (35.3)	Peer evaluation	2 (11.8)
Skills stations	17 (100)	Clinical practical exams	15 (88.2)
Reflective learning	8 (47.1)	Competency checks	11 (64.7)

MCQs: Multiple choice questions.
OSCEs: Objective structured clinical examinations.

Table 2. Useful learning/teaching approaches for improving hand hygiene of medical students.

Teaching/Learning approach	Disagree No. (%)	Agree No. (%)	Unsure No. (%)
Lectures	9 (52.9)	7 (41.2)	1 (5.9)
Case-based problem solving	5 (29.4)	7 (42.2)	5 (29.4)
Online material	0	12 (70.6)	5 (29.4)
Reflection	0	12 (70.6)	5 (29.4)
Practical exercises	0	15 (88.2)	2 (11.8)

reflection and practical exercises were considered to be the most useful teaching approaches (Table 2). Only two participants agreed with the suggestion that HH concepts should only be taught in the hospital setting (Table 3).

Discussion

Currently most of the medical schools surveyed rely on the use of traditional lectures and case scenarios to teach important infection control concepts, including HH. As previously highlighted, O'Brien and colleagues in their survey of medical schools in UK and Ireland found that their study participants reported relying on MCQs for assessment (O'Brien et al, 2009). In comparison, our study respondents reported using practical clinical exams for assessment. As universities start to move away from traditional approaches of teaching (i.e. face to face lectures, tutorial sessions), medical schools may need to start considering the introduction of assessment-based strategies, reflection, and e-learning approaches. While there have not been any studies which have identified the optimal approach to teaching infection control and HH concepts, it has been suggested that more attention and innovation is needed (Fisher et al, 2010; Scheithauer et al, 2012). In their study, Fisher et al (2010) used the World Health Organization's audit package combined with video-based scenarios around the 'My 5 moments of HH' to teach HH to medical students. They reported receiving strong positive feedback as most of the students considered their approach helpful in enhancing their knowledge around HH (Fisher et al, 2010).

In recent times blended learning has been trialled as a teaching and learning approach in some medical schools across Australia (Ilic et al, 2013). In blended learning, some aspects of the campus-based course are designed for an online learning environment to improve the flexibility of access and provide a broader range of learning opportunities for students (Lehmann et al, 2010; Pereira et al, 2007). One of the suggestions made by our respondents was to include online approaches to teach HH to medical students. Given the ever-increasing demands being placed on the medical curriculums and the inability to dedicate additional in class time to teaching concepts such as infection control, moving towards online modules around infection control and hand hygiene may be a novel and effective solution that medical schools could consider. Online teaching tools could cover the background theory around healthcare associated infections, HH and its role in reducing HAIs, which could be supported by face to face training sessions during which students could engage in scenarios around WHO's '5 moments of HH'. However, before we move towards this model it would be useful to either update the current tools or develop new tools that are specifically targeted at medical students. Having scenarios that focus on medical students' practices in hospitals and other healthcare settings

Table 3. Attitudes of medical educators to teaching/learning of hand hygiene to medical students.

Statement	Disagree No. (%)	Agree No. (%)	Unsure No. (%)
Students are very receptive to learning concepts about hand hygiene	3 (17.6)	8 (47.1)	6 (35.3)
Students rate learning about hand hygiene as equivalent to learning about other core medical concepts	8 (47.1)	4 (23.5)	5 (29.4)
Hand hygiene should be mainly taught at hospitals during clinical practice	15 (88.2)	0	2 (11.8)

will help students relate to the material and hopefully improve long term knowledge retention and ultimately compliance.

In some settings, participants felt that insufficient time is currently being given to the teaching of infection control and that HH messages are not currently being reinforced during the course appropriately. In support of this finding is a report from Melenhorst et al (2009) which also voices concerns that the hygiene behaviour of students is being compromised during their medical training because of a shortage of HH education in the medical curriculum. Interestingly, it is not just the experts who are concerned. A number of surveys have documented that the students themselves are also not satisfied. For example, Duroy and Le Coutour (2010) surveyed French medical students and reported that 66.5% of the participants considered their HH training to be insufficient. They recommended that in the particular case of medical students, the importance of HH must be taught from the first year and integrated into their clinical curricula throughout medical program (Duroy and Le Coutour, 2010).

Our participants also recommended the use of reflection as a teaching approach. While the use of this strategy is not new to medicine, to the best of our knowledge, it is rarely applied to teaching HH and infection control. Reflection may help students contextualise patient safety with HH and reflect on their own HH practices in comparison to their role models and peers. One study that looked at the role of reflection was undertaken by Burnett et al (2008), who measured the reflective ability of 5th year medical students in relation to their HH practices following the introduction of a cleanliness champion programme aimed at teaching the students to maintain a culture in which safety and adherence to infection control practices is of the highest importance. Their study results suggest that the students were able to link theory to practice following the completion of the programme.

As suggested by our participants, there is currently a culture among the medical students to disregard or downplay the importance of learning about HH. While we did not include any students in this study, a previous hospital based study by van de Mortel has documented this negative attitude towards HH among Italian medical students (van de Mortel et al, 2012). It has been suggested that this negativity is a direct consequence of medical students witnessing the poor HH practices of senior doctors or their role models (Feather et al, 2000; Roberto et al, 2011), which was acknowledged by our study participants too. This signifies the important role played by senior doctors in reinforcing a culture of patient safety and proper HH and thus bringing a change in the attitudes of medical students towards HH.

Our survey was limited to assessing the views of medical educators and did not assess the knowledge, attitudes, and practices of medical students and infection control academics. Nonetheless our study provides important information about the current learning/teaching around HH and future directions in order to improve the HH compliance of medical students.

Our study participants were in favour of teaching HH at the medical school level compared to solely relying on the actual clinical setting for teaching these concepts. Infection control concepts should be introduced early on in the curriculum and reinforced in a variety of clinical/non-clinical environments as suggested by our respondents. The learning and teaching approaches useful for improving HH of medical students suggested by our respondents may help to familiarise medical students with good HH practices and their importance in patient safety. These may also bring about a change in their attitudes towards HH. Increased knowledge and positive attitudes towards good HH practices may eventually influence their adherence to good HH practices. Directions for future research include investigating the attitudes of Australian medical students and exploring the feasibility of implementing blended learning approaches.

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