Journal of Hospital Infection 95 (2017) 355–358

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Short report

Setting the right foundations: improving the approach used to teach concepts of hand hygiene to medical students

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ARTICLE INFO

Article history:
Received 8 November 2016
Accepted 11 January 2017
Available online 18 January 2017

Keywords:
Hand hygiene
Teaching
Learning
Five Moments for Hand Hygiene

SUMMARY

A pre- and postintervention study was conducted to evaluate the impact of a new hand hygiene (HH) teaching module on the knowledge and attitudes amongst medical students towards HH. The teaching module significantly improved knowledge about HH indications and duration (T1=7.9, T2=9.2, T3=9.1; P=0.001), the use of HH materials (T1=1.3, T2=3.8, T3=4.3; P=0.004), and the 'Five Moments for HH' (T1=3.1, T2=6.7, T3=5.9; P=0.012). It also improved the students' attitudes towards HH (T1=48.5, T2=56.2, T3=54.1; P=0.04). Additional studies are warranted to evaluate the impact of this intervention on actual HH compliance of medical students.

Introduction

The World Health Organization (WHO) guidelines on hand hygiene (HH) in health care recommend that HH interventions should be formulated and executed based on the known resistance factors to HH documented for healthcare workers (HCWs).[1] Similar to other HCWs, the resistant factors associated with poor HH compliance of medical students are lack of knowledge, ignorance of the risks, misconceptions and poor HH practices by role models.[2,3]

WHO recommends education and training as part of a multimodal strategy to improve HH knowledge and compliance amongst all HCW categories, including medical students.[1] Previous studies that have utilized education as either a sole approach or as part of a multi-modal intervention have reported improvements in HH for other HCWs,[4] and medical students,[5] as a result of an increase in knowledge of HH.

Despite the fact that past studies have recommended an increased emphasis on HH in undergraduate teaching, very few studies to date have explored the development and testing of HH education modules for undergraduate students.[5] The development of HH education materials should be based on available evidence and expert opinion.[1] Therefore, prior to undertaking this study, the barriers and facilitators of HH in medical students were explored by interviewing medical students and medical education and/or infection control experts.[6] An Australian-wide survey of the deans of medical education of

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http://dx.doi.org/10.1016/j.jhin.2017.01.006
0195-6701/

17 medical schools was also undertaken to explore the different HH teaching approaches used.[7] Both students and academics recommended that HH teaching should start at university level and continue into the clinical setting. Scenario-based learning (SBL) activities were considered to be the best mode of teaching HH at university level. This study aimed to evaluate the impact of a new HH teaching module on the knowledge (including retention) and attitudes amongst medical students towards HH.

Methods

A convenience sample of 96 undergraduate medical students from Years 1 and 2 was recruited from a university in Sydney, Australia. Students were approached during their group facilitation sessions, during that time students are generally working on SBL activities in small groups. Each facilitation group consisted of 13–15 medical students.

Students were asked to complete the baseline questionnaire (time period T1). This was followed by a 30-min teaching session on healthcare-associated infections (HCAIs) and HH, with a second questionnaire two weeks (time period T2) after the session. A third online questionnaire was completed six months (time period T3) after the baseline questionnaire. The teaching module consisted of a practical demonstration of HH accompanied by a Powerpoint (Microsoft Corp., Redmond, WA, USA) presentation on the importance of HH and its impact on HCAIs, and an SBL activity around a scenario in which a medical student in a hospital setting forgets to carry out the 'Five Moments for HH'. Students worked in small groups to identify the missed moments and the consequences of missing these moments.

All three questionnaires included the same set of questions to assess students' knowledge and attitudes towards HCAIs and HH. These questions had a multiple-choice format, with at least one correct answer. A set of seven questions assessed the students' knowledge of HH, including indications and duration of HH. Students were also asked to rate HH on as scale of 1–10 to understand the level of importance that they give to HH. Two questions assessed students' knowledge about the relationship between HH and HCAIs, and three questions were asked about HH approaches, i.e. soap vs alcohol-based hand rub (ABHR). Eight questions were asked about the 'Five Moments for HH' and the correct technique for performing HH. Fourteen questions assessed attitudes towards HH, which were rated using a five-point Likert-type scale (1=strongly disagree, 5=strongly agree). The second questionnaire had nine additional questions that aimed to capture attitudes towards the teaching module, mainly to assess comprehensibility, appropriateness and usability of the teaching module. Seven open-ended questions were included in order to obtain detailed feedback about the specific aspects of the module that students liked or disliked, and what further improvements are required. Demographic characteristics were recorded at baseline.

Statistical analysis

Statistical Package for the Social Sciences Version 23 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. Linear mixed effects models were used to assess outcome variables with multiple time points to allow for correlated and missing data. Scores were computed by combining variables assessed across three time periods. The combined main variables were knowledge of HCAIs, HH, HH materials, 'Five Moments for HH' and attitudes towards HH. $P \leq 0.05$ was considered to indicate statistical significance.

Results

One hundred and twenty-six medical students were approached; of these, 96 (76%) agreed to participate. At six-month follow-up, 80/96 participants completed the last questionnaire. All three questionnaires were completed between July 2014 and March 2015. The mean age of participants was 19.2 years (standard deviation 0.97 years, range 18–22 years) and 65.6% were female. Of the 96 participants, 53 (55.2%) were in Year 1 and 43 (44.8%) were in Year 2.

Using a mixed effects model with random baseline measurements, the results identified a significant mean difference in the scores between baseline and the two follow-up questionnaires in relation to the questions around HH indication and duration, as shown by an increase in mean score over the three time periods (T1=7.9, T2=9.2, T3=9.1; P=0.001) (Table I). Significant improvement in knowledge was also noted in the questions about HH and HCAIs (T1=2.3, T2=3.8, T3=3.7; P=0.018). There was a significant improvement in knowledge about the use of ABHR and soap between baseline and the two follow-up surveys (T1=1.3, T2=3.8, T3=4.3; P=0.004). On reviewing the individual responses, the percentage of correct responses ranged from 8% to 63% at baseline for questions on knowledge about HH, HCAIs and indications for use of ABHR and soap. This increased to 68–100% at T2 and 60–100% for T3. Thus, there was an overall increase in knowledge in the two

Table I
Variable mean scores for knowledge and attitudes among medical students at three time points

Score	Mean (95% CI)			*P*-value
	T1 *N*=96	T2 *N*=96	T3 *N*=80	
Knowledge of HCAIs	2.3 (2.2–2.5)	3.8 (3.6–3.96)	3.7 (3.6–3.9)	0.018
Knowledge of HH	7.9 (7.5–8.4)	9.2 (8.8–9.7)	9.1 (8.5–9.4)	0.001
Knowledge of HH materials	1.3 (1.2–1.5)	3.8 (3.6–4)	4.3 (4.1–4.6)	0.004
Knowledge of 'Five Moments for HH'	3.1 (2.9–3.4)	6.7 (6.5–7)	5.9 (5.7–6.2)	0.012
Knowledge of HH and HCAIs	2.8 (2.7–3)	3.8 (3.6–3.9)	3.8 (3.7–3.9)	<0.001
Attitude	48.5 (47.6–49.5)	56.2 (55.3–57.3)	54.1 (53–55.1)	0.04

HCAIs, healthcare-associated infections; HH, hand hygiene; T1, baseline; T2, two weeks post intervention; T3, six months post intervention; CI, confidence interval.