ORIGINAL REPORTS

A Randomized Controlled Trial to Compare e-Feedback Versus "Standard" Face-to-Face Verbal Feedback to Improve the Acquisition of Procedural Skill

Wissam Al-Jundi, MBBS, MSc, MEd, FRCS,[*,†] *Mohamed Elsharif, MBBS, MRCS, MSc, PgCert (MedEd),*[*] *Melanie Anderson, MBChB MRCS,*[*] *Phillip Chan, MA, MBBChir, MChir, FRCS,*[*,†] *Jonathan Beard, MBBS, BSc, ChM, MEd, FRCS,*[*,†] *and Shah Nawaz, MB ChB, MEd, MBA, MD, FRCS, FRCS (gen)*[*,†]

[*]Sheffield Vascular Institute, Northern General Hospital, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, United Kingdom; and [†]Academic Unit of Medical Education, University of Sheffield, Sheffield, United Kingdom

BACKGROUND: Constructive feedback plays an important role in learning during surgical training. Standard feedback is usually given verbally following direct observation of the procedure by a trained assessor. However, such feedback requires the physical presence of expert faculty members who are usually busy and time-constrained by clinical commitments. We aim to evaluate electronic feedback (e-feedback) after video observation of surgical suturing in comparison with standard face-to-face verbal feedback.

METHODS: A prospective, blinded, randomized controlled trial comparing e-feedback with standard verbal feedback was carried out in February 2015 using a validated pro formas for assessment. The study participants were 38 undergraduate medical students from the University of Sheffield, UK. They were recorded on video performing the procedural skill, completed a self-evaluation form, and received e-feedback on the same day (group 1); observed directly by an assessor, invited to provide verbal self-reflection, and then received standard verbal feedback (group 2). In both groups, the feedback was provided after performing the procedure. The participants returned 2 days later and performed the same skill again. Poststudy questionnaire was used to assess the acceptability of each feedback among the participants.

RESULTS: Overall, 19 students in group 1 and 18 students in group 2 completed the study. Although there was a significant improvement in the overall mean score on the second performance of the task for all participants (first performance mean 11.59, second performance mean 15.95; $p \leq 0.0001$), there was no difference in the overall mean improvement score between group 1 and group 2 (4.74 and 3.94, respectively; $p = 0.49$). The mean overall scores for the e-feedback group at baseline recorded by 2 independent investigators showed good agreement (mean overall scores of 12.84 and 11.89; Cronbach $\alpha = 0.86$). Poststudy questionnaire demonstrated that both e-feedback and standard verbal feedback achieved high mean Likert grades as recorded by the participants (4.42 [range: 2-5] and 4.71 [range: 4-5], respectively; $p = 0.274$).

CONCLUSION: e-Feedback after watching a video recording appears to be acceptable and is not quantitatively different than standard feedback in improving suturing skills among novice trainees. Video assessment of procedural skills is reliable. (J Surg Ed ■:■■■-■■■. Crown Copyright © 2016 Published by Elsevier Inc. on behalf of the Association of Program Directors in Surgery. All rights reserved.)

KEY WORDS: procedural skills, surgical training, feedback, video recording, e-learning

COMPETENCIES: Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism

INTRODUCTION

Feedback can be defined as "specific information about the comparison between a trainee's performance and a standard, given with the intent to improve the trainee's performance.[1]"

Correspondence: Inquiries to Wissam Al-Jundi, MBBS, MSc, FRCS, Sheffield Vascular Institute, Northern General Hospital, Harries Rd, Sheffield, United Kingdom; e-mail: waljundi@hotmail.com

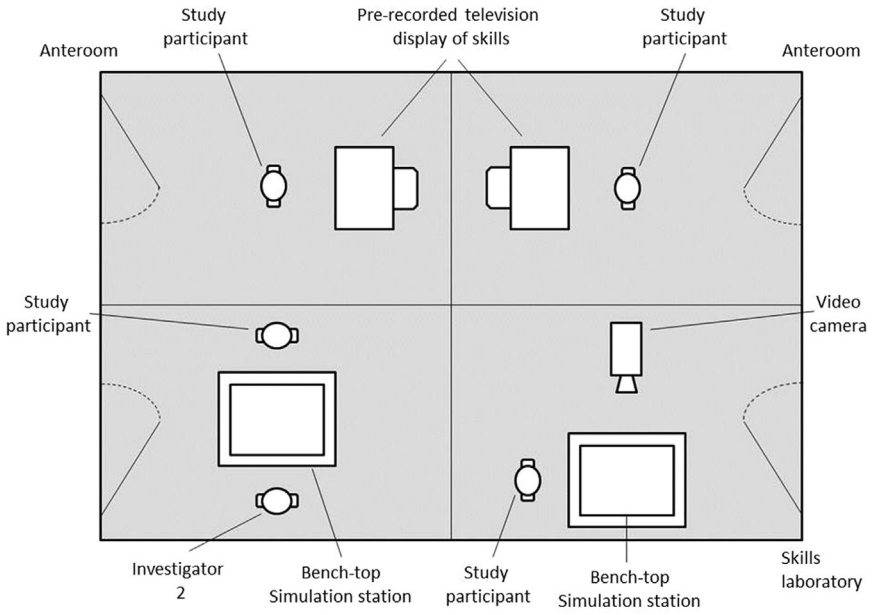

FIGURE 1. Layout of the facilities used for data capture in the study. The participants watched the prerecorded video footage of the skill in the anterooms, and then performed the skill in the skill laboratory rooms. The 2 groups were separate all the time, and the participants made their way directly to the exit without returning to the anteroom.

Such feedback is fundamental for reinforcing learning when teaching procedural skills. The intended effect of this feedback is to help students and trainees learn and improve their performance. It is based on the assumption that feedback creates awareness of shortcomings and thereby motivates learners to improve or change.[2] In order for the feedback to be effective, it should be specific, objective, documented, and promote a specific learning goal.[3] In addition, it should focus on the process as feedback relating to the personal level is rarely effective.[4] In the context of procedural skills, feedback is usually based on objective assessment, during or following direct observation, using a structured pro forma in a summative setting such as an Objective Structured Clinical Examination or in a formative setting such as an Objective Structured Assessment of Technical Skill (OSATS).[5] Standard feedback is delivered verbally after direct observation of the procedural skill; however, this requires the physical presence of trained faculty, which can be difficult to arrange in a busy clinical environment. A recent student survey[6] revealed that across the UK, and in all undergraduate curricula, students are unhappy with the amount of feedback they receive from their respective faculty, yet most demonstrate good insight and empathize at the difficulties teachers encounter in providing effective feedback.[7] Both teachers and students recognize that time and resources are limiting factors, which can make individualizing feedback difficult. Technology has been implemented in various applications in training and simulation. Ericsson called for procedures to be video recorded for educational and research purposes which offer a new perspective for medical education, including residency training and continuing education.[8] Personal review of a recorded skill has been shown to improve the acquisition of procedural skill.[9] However, using video recording to provide remote e-feedback by a trainer has not been investigated before. This has the potential benefit of overcoming time and cost barriers for providing faculty. We present a randomized controlled trial (RCT) that aimed to compare e-feedback with standard verbal feedback during the acquisition of a basic procedural skill by surgical novices. We hypothesized that e-feedback is acceptable and equally effective to face-to-face feedback in improving suturing skills for novices. A validated pro forma was used to standardize the assessment and provide feedback. Minor modifications to the checklist were performed to make the pro forma applicable to the context of novices performing surgical suturing. An integral factor of an OSATS is the use of predefined pro formas against which the performance of a specific surgical skill can be measured and subsequent constructive feedback can be provided.[10]

METHODS

This prospective RCT was conducted over 3 days in February 2015 at the University of Sheffield. Ethical approval for the study was sought and granted via the University of Sheffield Ethics Committee process. The study participants were 38 undergraduate medical students who were assigned to an Integrated Learning Activity relating specifically to surgical skills as part of a Student Selected Component of the undergraduate curriculum. All students were informed that the Integrated Learning Activity would include participation in a scientific study. Written consent for inclusion in the study was obtained. Students attended the Clinical Skills Centre at the Northern