SIMULATION: THEORY TO PRACTICE IN UNDERGRADUATE MEDICAL EDUCATION

Pamela J Morgan* MD, FRCPC, Doreen Cleave-Hogg^ψ PhD, Susan DeSousa* BSc, RRCPC, Jenny Lam-McCulloch* MSc. * Department of Anesthesia, Sunnybrook & Women's College Health Sciences Centre, 76 Grenville St. Toronto, Ontario M5S 1B2, ^ψ Wilson Centre for Research in Education, University of Toronto, 200 Elizabeth St. Eaton Wing South, Room 565 University Health Network, Toronto, Ontario M5G 2C4

INTRODUCTION

Bridging the gap between theoretical knowledge and practical application has been problematical for most professions. Many recent innovations in medical curricula have focused on the need to integrate practice and theory and teaching students to “know how” rather than to “know all”. This study was designed to allow medical student teams to manage a high-fidelity simulation case and to repeat the scenario after a faculty-facilitated debriefing and review of written educational material.

METHODS

After research ethics board approval and informed consent, final year medical students completed a 10 question multiple choice quiz to identify their knowledge regarding the management of cardiac arrhythmias. Four simulation scenarios were presented and 1 of 4 scenarios was presented to each team of students. Faculty facilitated the sessions and feedback given using students' videotaped performances as a template for discussion. Performance evaluation scores using predetermined checklists and global rating scales were completed. Students then reviewed the American Heart Association guidelines for the management of unstable cardiac arrhythmias. The afternoon session involved repetition of the 4 case scenarios with the same teams involved but different team leaders. Students then repeated the multiple-choice quiz. Descriptive statistics, paired t test and repeated measures analysis of variance (ANOVA) were used to analyze results.

RESULTS

Two hundred ninety-nine students comprising 103 teams participated. There was a significant improvement between individual's pre and posttest pharmacology scores, $t=-7.650$ ($p<0.001$). Analyses of data indicated a significant improvement between pre and posttest simulator team performance scores when all scenarios were considered together ($F_{1,103}=101.29$, $p<0.0001$). Specific scenarios did have an impact on improvement in learning in that some scenarios were more difficult than others ($F_{3,103}=15.63$, $p<0.0001$). There was also significant improvement in checklist and global rating scores between pre and posttest performance when analyzed by scenario (Table 1).

Scenario #	Checklist Pre/Posttest	P value	Global Pre/Posttest	P value
1	$F_{1,26}=18.38$	$P<0.0001$	$F_{1,26}=22.75$	$P<0.0001$
2	$F_{1,26}=25.99$	$P<0.0001$	$F_{1,26}=20.08$	$P<0.0001$
3	$F_{1,26}=51.32$	$P<0.0001$	$F_{1,26}=34.67$	$P<0.0001$
4	$F_{1,26}=7.54$	$P=0.011$	$F_{1,26}=8.20$	$P=0.008$

DISCUSSION

High-fidelity simulation is a valuable learning experience and bridges the gap between theory and practice. Further studies examining communication skills and team dynamics are warranted.