Debriefing for Simulation-Based Medical Education: A Systematic Review and Meta-Analysis (Submission #159)

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Introduction/Background: Debriefing is a common feature of technology-enhanced simulation (TES) education. Evidence for its effectiveness, however, remains unclear. The authors sought to characterize how debriefing is reported in the TES literature, evaluate the effectiveness of debriefing in TES and identify features of debriefing that are associated with improved outcomes.

Methods: This review was planned, conducted and reported in adherence to PRISMA standards of quality for reported meta-analyses. In this systematic review, we sought to answer the following questions: 1) To what extent is debriefing reported as a component of simulation-based educational interventions? 2) To what extent is debriefing in TES for training health care professionals associated with improved outcomes in comparison to no intervention? and 3) How do outcomes vary for different debriefing instructional designs? Studies published in any language were included if they: (a) Investigated the use of TES in which a debriefing was done and labeled as a debriefing, OR in which there is another term/descriptor that indicates a discussion/dialogue between two or more individuals (eg. two learners or at least one learner and a facilitator); and (b) Involved health professionals at any stage in training or practice, in comparison with no intervention or with a study intervention, using outcomes of learning, behaviours or effects on patients. We excluded studies where feedback was delivered but there was no indication of discussion or dialogue between two individuals. We searched MEDLINE, EMBASE, CINAHL, PsychINFO, ERIC, Web of Science and Scopus using search terms for the intervention (eg. simulator, simulation, manikin), topic (eg. surgery, anesthesia, trauma) and learners (eg. education medical, education nursing, education professional). No beginning date cutoff was used and the last date of the search was May 11, 2011. This search was supplemented by adding the entire reference lists for several published reviews of health professions simulation and all article published in two journals devoted to health professions simulation (Simulation in Healthcare and Clinical Simulation in Nursing). Inclusion and exclusion criteria were applied to identify studies of interest. The authors worked independently and in duplicate to screen all titles and abstracts for inclusion. In the event of disagreement or insufficient information in the abstract, the full text of potential articles was reviewed independently and in duplicate. All conflicts were resolved by consensus. For each study, we extracted the training level of learners, clinical topic, training location, study design, method of group assignment, outcomes and methodological quality of the studies (graded using the Medical Education Research Study Quality Instrument [MERSQI]), along with several items related specifically to debriefing (eg. number of learners, facilitator presence, debriefing theory, debriefing structure, duration of debriefing, timing of debriefing).

Results: From a pool of 10903 studies, the authors identified 177 studies (11,483 learners) employing debriefing as part of TES. Effect sizes (ES) were pooled using a random-effects model. Among studies comparing TES with no intervention, ES were large for knowledge, process/product skills (eg. performance in simulated setting; successful task completion) and time skills/behavior (eg. time to complete task in real and simulated setting) outcomes (range=1.23-1.91) and small to moderate ES for behavioral process with outcomes of debriefing, timing of debriefing, versus no intervention. Among studies comparing high versus low physical realism simulators showed moderate effect sizes in favor of high realism simulation.

Conclusion: TES for pediatric education is associated with large effect sizes in comparison with no intervention. Studies comparing the use of high versus low physical realism simulators showed moderate effect sizes in favor of high realism simulation.

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