Virtual Patients in Health Professions Education: A Systematic Review

David A. Cook, MD, MHPE[1], Marc M. Triola, MD[2]
[1] Division of General Internal Medicine and Office of Education Research, Mayo Clinic College of Medicine, Rochester, MN, USA
[2] Division of Educational Informatics, New York University School of Medicine, New York, New York, USA

Principle Investigator
David A. Cook, MD, MHPE
Division of General Internal Medicine
Mayo Clinic College of Medicine
Baldwin 4-A, 200 First Street SW
Rochester, MN 55905

Phone: 507-538-0614
FAX: 507-284-5370
E-mail: cook.david33@mayo.edu

Background

Safer and more efficient means of facilitating clinically-relevant knowledge and skills are needed to accommodate the increasing complexity of medical decision-making. The computer-based virtual patient, "a specific type of computer program that simulates real-life clinical scenarios; learners emulate the roles of health care providers to obtain a history, conduct a physical exam, and make diagnostic and therapeutic decisions,"[1] has been proposed as one contribution to the solution.[2-4]

Importance of topic

Virtual patients are increasingly common in health professions education.[5] Educators will benefit from a better understanding of the potential roles of virtual patients, the instructional designs and outcomes commonly used, and which features are associated with higher outcomes. A review and synthesis of existing evidence could inform decisions on how to effectively use virtual patients. We are not aware of previous systematic reviews addressing these issues.

Methods

We seek to answer the questions: what design features are commonly used in virtual patients, what outcomes are commonly evaluated, and what features are associated with higher outcomes? We will adhere to standards of quality for reporting systematic reviews (QUOROM and MOOSE),[6, 7] including duplicate coding at all phases.

We will conduct a comprehensive search of MEDLINE, EMBASE, CINAHL, ERIC, and PsychINFO using terms including virtual patient, computer simulation, clinical simulation, and medical education. We will also identify relevant studies from investigators' files and from reference lists of included articles. We will include studies published in any language that have investigated use of virtual patients to teach health professions learners at any stage in training or practice. Working independently and in duplicate we will review all titles and abstracts for inclusion. In the event of disagreement or insufficient information we will review the full text of potential articles, in duplicate.

We will conduct full text review in duplicate. We will catalog all original research reports including descriptive studies. We will abstract in full all comparative studies (those with a pre/post-intervention assessment or comparison arm). Abstracted information will include study design, participant demographics, details of intervention(s), outcomes, and main quantitative and qualitative results.

We will group studies according to the research question(s) or hypothesis(es) using inductively-identified themes (conceptual frameworks). Within each theme we will pool quantitative results using random effects meta-analysis.

Importance of review

This review will benefit medical education in multiple ways. First, the catalog of studies (descriptive and comparative) will provide educators a reference to virtual patient designs employed for various clinical topics, and for comparative studies will identify effective virtual patient formats. Second, the quantitative syntheses will provide best estimate answers for each research question. Third, we hope to distill theoretical and conceptual insights[8] to inform future virtual patients. Fourth, the research themes identified will provide a starting point for further research.

Feasibility

Our preliminary search identified approximately 350 potentially eligible articles, of which we expect approximately 50 will be eligible for full review. The principal investigator has experience conducting systematic reviews including a recently-published meta-analysis of Internet-based instruction,[9] and anticipates the review can be completed within twelve months.

References *(note that references do not count in word limit)*

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Note to applicants:
The fact that this model document describes a systematic review / meta-analysis does not imply that SDRME Invited Reviews need to be systematic reviews. In fact, a large proportion of the sponsored reviews have been non-systematic. What is important, however, is that the review methods are clearly described, rigorous, feasible, and appropriate to answer the question of interest.