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A scoping review to understand simulation used in interprofessional education

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ABSTRACT

The purpose of this scoping review is to describe professions engaged in interprofessional education-focused simulations, characterize the types of simulations, and review common facilitators and barriers to utilization in the classroom, clinical and experiential settings. An electronic search of PubMed, CINAHL, Scopus and ERIC databases was conducted. Peer-reviewed, English-language articles published between January 2007 and November 2017 were retrieved. Articles were included if they were interprofessional, included learners and simulation, were research articles, and had full text available. A total of 315 articles were screened and 93 were eligible for analysis, of which, 64% (n = 60) were published since 2015. The most common professions were nursing (n = 76), medical students (n = 55), physical therapy (n = 27), pharmacy (n = 25), and medical residents (n = 13), respiratory therapy (n = 12), occupational therapy (n = 12), dentistry (n = 9), and paramedic (n = 8). The most common types of simulations were mannequin alone (n = 33), or standardized patients alone (n = 17) as well as standardized patient plus mannequin (n = 11) or other types of multiple simulations (n = 18). Typically, between three to six professions participated in each simulation (range 2–13). Key facilitators included representation of more than two professions, including at least one learner per profession on each team, using realistic cases that could be adapted to reflect the learner's knowledge and skills, allowing repetitive practice in order to fix mistakes, including a debriefing session, and including simulations in required courses. Barriers included not having enough learners for a valid evaluation of the simulation experience, learner's lack of experience with interprofessional education or simulations, learner's feeling uncomfortable being observed, different knowledge and skill by profession, poor learner attitude, scheduling, cost, and incorporating learners who are both required and elect to complete the simulation. Additional research is needed to assess the impact of these experiences, both at the time of the activity and as learners transition to become practitioners.

1. Introduction

Over the past few decades there have been advances in structured educational venues in which health sciences learners study from one another, gain transferable communication skills, and develop patient care strategies for better health care, and thus, outcomes. Interprofessional education (IPE) has become increasingly recognized as significant to train health sciences learners as a "collaborative ready workforce" that can properly manage complex health conditions.[1] IPE curriculum for dentistry, medicine, osteopathic medicine, public health, nursing, and pharmacy, as well as other health sciences (e.g., optometry, social work, etc.), has been developed with the objective of meeting the overarching competency domain of Interprofessional Collaboration.[2]

Simulations have been used to provide a safe and realistic environment for health care professional learners to gain knowledge and practice within their respective professions such as managing emergencies and diagnostic arthroscopy within medicine, pain management and mental health care within nursing, denture procedures and dental implant training for dentistry and preparation of intravenous medications and medication therapy management within pharmacy.[3–10] Beyond technical skills, simulations are frequently used to practice problem-solving, decision-making, communications skills, and the ability to work as a team.[11] Common types of simulations include computer-based, high-fidelity mannequins which mimic human physiology and functionality, and standardized patients which are individuals to portray a patient in a medical situation.

There has been an interest in the overlap between simulation and

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interprofessional education; however, a comprehensive evaluation of these educational initiatives has not been reported.[12] The purpose of this scoping review was to describe professions engaged in IPE-focused simulations, characterize the types of simulations, and review common facilitators and barriers to utilization in the classroom and clinical settings. We conclude by giving recommendations for educators interested in implementing IPE-focused simulations as well as opportunities for future research.

2. Methods

2.1. Study inclusion criteria

This literature review includes reports of qualitative, quantitative, and mixed methods studies published between 2007 and 2017. We focused on this time interval in order to capture the most recent trends in the overlap between simulation and interprofessional education. Studies were required to be a peer reviewed research study, include both students and trainees (e.g., medical residents) as the learners, be interdisciplinary, and include simulation.

2.2. Study identification

The following databases were searched for English language studies: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Education Resources Information Center (ERIC), and Scopus. We designed search strategies in consultation with an Informationist at the University's Health Sciences Library. Boolean search techniques using the following terms were utilized: (IPE[tiab] OR “interprofessional education"[tiab] OR “multidisciplinary education"[tiab] OR “interdisciplinary education"[tiab] OR “interprofessional learning"[tiab]) **AND** (course[tiab] OR class[tiab] OR courses[tiab] OR classes[tiab] OR classroom[tiab] OR classrooms[tiab] OR workshop [tiab] OR workshops[tiab] OR “experiential learning"[tiab] OR “reflective learning"[tiab] OR “hands on learning"[tiab] OR internship [tiab] OR internships[tiab] OR training[tiab] OR “case study"[tiab] OR “learning experience"[tiab]) **AND** (simulator[tiab] OR simulators[tiab] OR simulation[tiab] OR simulate[tiab]). Two research team members discussed and applied inclusion/exclusion criteria to screen potential articles for inclusion in an iterative process.[13] This was reviewed by a third team member. The team engaged in iterative discussions when questions arose until consensus was reached. A total of 135 articles were included for full review. The literature search and article identification flow are shown in Fig. 1.

2.3. Data extraction and synthesis

Our research team developed a data abstraction form to collect information related to the (1) type of simulation, (2) setting, (3) description of the intervention, (4) facilitators, (5) barriers, and (6) number of learners by discipline.[13] Two research team members reviewed a selection of articles independently. Their results were compared and discrepancies discussed with a third team member until consensus was reached. Data that was compiled in the data abstraction form was reviewed by all study team members. Microsoft Excel was used to analyze quantitative data and descriptive statistics that were reported. Qualitative data was analyzed for themes and frequencies by two team members. Preliminary results were reviewed by all team members and discussion occurred until consensus was reached.

The following iterative process was subsequently used to guide the review. All of the team members (authors) collaborated to develop a process for gathering and organizing data including the study profile (title and year of publication), professions, number of learners per profession, type of simulation, setting of the activity, description of the intervention, and facilitators and barriers to implementation and evaluation. Two core team members (CL and KP) were trained and subsequently served as coders. Their submitted information was maintained and updated in a shared Google Drive folder. When additional clarification was needed, it was discussed with the entire study team. We synthesized the key qualitative results through team discussions of predominant themes associated with facilitators and barriers. Descriptive statistics were used to report the average number of professions and learners by type of simulation.

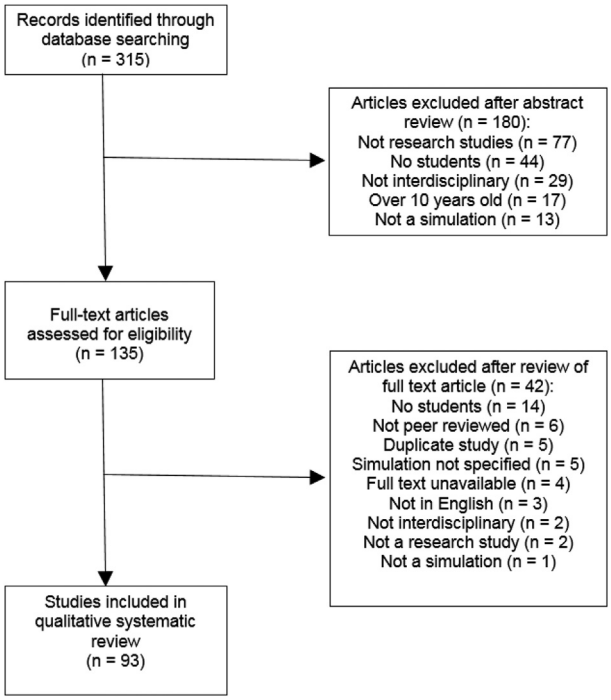

Fig. 1. Flow Diagram.[14]

3. Results

A total of 93 articles were included in this qualitative scoping review. Table 1 through 7 present the summary of the reviewed studies arranged by type of simulation and year. The number of studies has significantly increased over the past decade, with 64% being published since 2015. The most common professions engaged in simulation as an IP learning experience were nursing (n = 76), medical students (n = 55), physical therapy (n = 27), pharmacy (n = 25), and medical residents (n = 13), respiratory therapy (n = 12), occupational therapy (n = 12), dentistry (n = 9), and paramedic (n = 8). Professions that were reported less frequently are listed under “Other Area of Expertise” (Table 1 through 7). As this review focused on learners, the counts and averages only include learner groups; however, a list of health care professionals is also provided in Table 1.

The most common types of simulations included using mannequin alone (n = 33) or standardized patients alone (n = 13) as well as standardized patients plus mannequin (n = 11) or other combinations of simulations (n = 18) (Table 8). Typically, between three to six professions participated in each simulation (range 2–13). Role play and emergency response simulators typically included the most professions. The average number of learners varied by type of simulation, but 100 to 200 learners was commonly included. The settings for the simulation varied but the classroom, clinic or simulated laboratory were all represented. The most common type of intervention was a simulation followed by a debriefing session.

Common facilitators and barriers were identified and categorized according to whether they applied to the study design, learners, simulation, or logistics (Table 9). Key facilitators included representation of more than two health care professionals, including at least one learner