

Simulation-Enhanced Interprofessional Education in Health Care*

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Abstract

Using simulation-enhanced interprofessional education in health care increasingly refers to the development of team member. Collaborative teamwork in a simulated healthcare environment can contribute to increasing students' understanding of professional roles and team building in clinical settings. Common objectives are developed for both teams that focused on safer care, effective communication, and implementation of appropriate decision-making in the management of patients. Studies highlight the benefits of social learning with peers, noting that collaboration enhances knowledge, especially when learners are responsive to the contributions of others. However, simulated interprofessional education presents many challenges that can impact teamwork opportunities. Additional research needs to be conducted to evaluate the most effective way to incorporate simulation in teamwork learning. The purpose of this study is to present a framework of IPE and specific recommendations to achieve competencies and address these challenges for IPE using simulation.

Keywords

Simulation, Interprofessional Education, Interprofessional Collaborative

1. Introduction

Simulation, the art and science of recreating a clinical scenario, has been a necessary active technique in nursing education because it has the ability to be used for evaluation of cognitive, psychomotor, and affective domains of learning (Decker et al., 2008; Regan & Onello, 2013; Jeffries, 2005). Simulation provides the opportunity for nurses to practice skill sets repeatedly until they develop a routine for safe patient care. Another advantage to simulation is that it permits interprofessional education (IPE), allowing each nurse to examine the roles of other professions (NLNAC, 2012). IPE involves integrating the perspective of professionals from two or more profes-

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sions, by organizing the education around a specific discipline, where each discipline examines the basis of their knowledge” (Palagnas, 2012). Interprofessionalism (IP) is “the effective integration of professionals through mutual respect, trust, and support, from various professions who share a common purpose to mold their knowledge and skills”. Similar to constructivist pedagogy, transformative learning theory promotes educational practices to empower learners (Howkins & Bray, 2008).

The World Health Organization (WHO) describes IP collaborative practice as occurring, “when multiple health workers from different professional backgrounds work together with patients, families, caregivers, and communities to deliver the highest quality of care.” The WHO has provided standards for nursing education and recommended the use of simulation to work together in collaborative teams (WHO, 2010). The International Nursing Association for Clinical Simulation Learning (INACSL) and The National League for Nursing (NLN), endorsed simulation use to prepare students for IP teamwork, complex clinical and critical thinking skills to be more achievable of the simulation model. The IPE Collaborative Expert Panel (IPECEP) and American Association of Colleges of Nursing included IPE criteria in their accreditation guidelines. Also, the Society for Simulation in Healthcare also has focused on IPE strategies at their annual meetings (NLNAC, 2012; IPECEP 2011). Simulation enhanced IPE is defined as the use of health care simulation modalities with scenarios designed to increase understanding about other professions for holistic approach and transformative learning. Team members contribute an individualized knowledge base and specific skills, keep lines of communication open and involve shared decision making during simulation activities (Sanford, 2010; Palagnas, 2012).

The purpose of the simulation enhanced IPE is to advance quality and safety of care, understanding and respect for other disciplines, relationship, collaboration, knowledge-sharing, cost effectiveness, problem-solving, future health system needs and communication among health care professions and to improve the quality of care in health settings. It is not a merging of or dilution of roles (Howkins & Bray, 2008, AHRO, 2008). There are many principles of effective IPE experiences include responsibility, investing time in pre-planning with all stakeholders, ensuring clear communication, accountability, coordination, open communication, cooperation, assertiveness, autonomy, and mutual trust and respect. A successful IPE will ensure that students can experience, share, and practice these traits with each other. As a part of simulation enhanced IPE health care, students become more immersed in their own education and more comprehensive understanding of their role in the health-care team (IPECEP 2011).

2. Purpose

Despite the demonstrated value of the IPE approach to using simulation for ongoing patient-centered care still has not been completely integrated into all school of health professions. This study presents review of the mean elements of IPE and practical recommendations to achieve competencies for IPE using simulation.

3. Theoretical Framework for Simulation-Enhanced IPE

3.1. Importance of Simulation-Enhanced IPE

Simulation provides unique experiences to improve student’s cognitive and psychomotor skills. The power of simulation lies in its fidelity and interactive manner beyond the didactic learning, which leads to better patient outcomes and more sustainable program. Health care simulation is recognized as an ideal vehicle for IPE (Palagnas, 2012). IPE is a partnership between a team of health providers, which includes coordination, communication, knowledge, and skills. Today’s patients have complex health needs and typically a single profession cannot adequately meet all the complex needs of patients. Medical error rates are frequently due to poor communication within healthcare professional teams. All practitioners’ work as part of team, individual competency alone is not sufficient in clinical setting. Over time, healthcare professionals are desired to focus on IPE, so simulation provides the next best alternative to keep patient safe and near-miss events (NLNAC, 2012).

Simulated enhanced IPE is an approach to develop healthcare students for future IP teams. This model includes many forms such as clinical setting, tele-health, online simulation-based IPE activities, and community disaster experts. In fact, IPECEP also cite an urgent need for quality IP learning opportunities for health care disciplines. Finally, IP collaborative practice competencies have been developed to provide strategies toward teamwork learning by the IPECEP in 2011. The group formed the framework for the effective simulate IP practice. The IPECEP came to consensus the 38 competencies under 4 domains (IPECEP, 2011) (see Table 1).

Table 1. Main competencies of IPE.**Domain 1: Values/Ethics Competencies for IPE**

- VE1. Place the interests of patients and populations at the center of IP health care delivery.
- VE2. Respect the dignity and privacy of patients while maintaining confidentiality in the delivery of team based care.
- VE3. Embrace the cultural diversity and individual differences that characterize patients, populations, and the health care team.
- VE4. Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions.
- VE5. Work in cooperation with those who receive care, those who provide care, and others who contribute to or support the delivery of prevention and health services.
- VE6. Develop a trusting relationship with patients, families, and other team members.
- VE7. Demonstrate high standards of ethical conduct and quality of care in one's contributions to team-based care.
- VE8. Manage ethical dilemmas specific to IP patient/ population centered care situations.
- VE9. Act with honesty and integrity in relationships with patients, families, and other team members.
- VE10. Maintain competence in one's own profession appropriate to scope of practice.

Domain 2: Roles/Responsibilities Competencies for IPE

- RR1. Communicate one's roles and responsibilities clearly to patients, families, and other professionals.
- RR2. Recognize one's limitations in skills, knowledge, and abilities.
- RR3. Engage diverse health care professionals who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs.
- RR4. Explain the roles and responsibilities of other care providers and how the team works together to provide care.
- RR5. Use the full scope of knowledge, skills, and abilities of available health professionals and health care workers to provide care that is safe, timely, efficient, effective, and equitable.
- RR6. Communicate with team members to clarify each member's responsibility in executing components of a treatment plan or public health intervention.
- RR7. Forge interdependent relationships with other professions to improve care and advance learning.
- RR8. Engage in continuous professional and IP development to enhance team performance.
- RR9. Use unique and complementary abilities of all members of the team to optimize patient care.

Domain 3: IP Communication Competencies for IPE

- CC1. Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.
- CC2. Organize and communicate information with patients, families, and health care team members in a form that is understandable, avoiding discipline-specific terminology when possible.
- CC3. Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care decisions.
- CC4. Listen actively, and encourage ideas and opinions of other team members.
- CC5. Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others.
- CC6. Use respectful language appropriate for a given difficult situation, crucial conversation, or IP conflict.
- CC7. Recognize how one's own uniqueness, including experience level, expertise, culture, power, and hierarchy within the health care team, contributes to effective communication, conflict resolution, and positive IP working relationships.
- CC8. Communicate consistently the importance of teamwork in patient-centered and community focused care.

Domain 4: Team and Teamwork Competencies for IP

- TT1. Describe the process of team development and the roles and practices of effective teams.
- TT2. Develop consensus on the ethical principles to guide all aspects of patient care and teamwork.
- TT3. Engage other health professionals—appropriate to the specific care situation—in shared patient centered problem solving.
- TT4. Integrate the knowledge and experience of other professions appropriate to the specific care situation—to inform care decisions, while respecting patient and community values and priorities/ preferences for care.
- TT5. Apply leadership practices that support collaborative practice and team effectiveness.
- TT6. Engage self and others to constructively manage disagreements about values, roles, goals, and actions that arise among health care professionals and with patients and families.
- TT7. Share accountability with other professions, patients, and communities for outcomes relevant to prevention and health care.
- TT8. Reflect on individual and team performance for individual, as well as team, performance improvement.
- TT9. Use process improvement strategies to increase the effectiveness of IP teamwork and team-based care.
- TT10. Use available evidence to inform others on effective teamwork and team-based practices.
- TT11. Perform effectively on teams and in different team roles in a variety of settings.

3.2. Main Competencies of IPE

Instructors to determine objectives for the simulation-based IPE may use these competencies. All domains can be developed through simulation experiences to maintain a climate of mutual respect and shared values. Characteristics of effective teams: open communication, use of reflection and feedback for continual improvement and effective practice. According to INACSL, simulation standards represent principles, beliefs, and values that provide the teamwork, and patient-centered care. Recently, health care practitioners from nursing, physician, residents, pharmacy, physical therapy, and dentistry have adopted immersive high fidelity mannequin-based simulation methodologies as well as standardized patients, confederates, hybrid, task training, team-based games, in-situ, virtual simulation focused on developing IPE program called Team Strategies and Tools to Enhance Performance and Patient Safety (Team STEPPS) (NLNAC, 2012). The Team STEPPS highlights the power of simulation to enhance ethic values, roles, responsibilities, communication, evidence-based and team-based practices, using various units such as mock operating room, intensive care, labor-delivery suit, and emergency unit. Also IPE contribute to team members being “on the same page” during the scenarios (AHRO, 2008).

Another communication guide often used is the ISBARR (introduction, situation, background, assessment, recommendation, and read-back) while work together. This guide helps promote information about patient’s condition in the IPE. For management of patient such as informed consent, error prevention, effective care, IV therapy, advanced invasive procedures, connect patient monitor, communicate with team, patient and caregivers, vital signs, central venous access device, patient examination, assessment, reduction of risk potential, comfort, safe use of equipment, perioperative care, parenteral therapy, including care at the end of life, crisis intervention, patient advocate, ethical practice, team leader roles, and emergency care are integrated into simulation activities (AHRO, 2008; Paige et al., 2009). In 2012, the Society for Simulation in Healthcare (SSH) and NLN identified that the healthcare simulation framework may help better understand IPE outcomes and practice challenges as an instrument in this science (see **Figure 1**).

A review of the literature showed that if educator is not well organized to manage IPE or adopt the teaching methods to achieve appropriate objectives for teamwork, this model would not enhance student learning. Also, Simulation-based IPE Reliability Validity Assessment (Sim-BIE RVA) Framework offers a process for creating a high-quality simulation enhanced IPE as a general guide. Most importantly, this framework generates new capabilities and describes challenges in the IPE (Palagnas, 2012):

- 1) Assess needs; describe their professional knowledge, skills, attitudes and values and limitations relevant to these.
- 2) Describe the target learners and environment.
- 3) Match expectation and knowledge both partners.
- 4) Finalize IPE learning objectives and identify challenges.

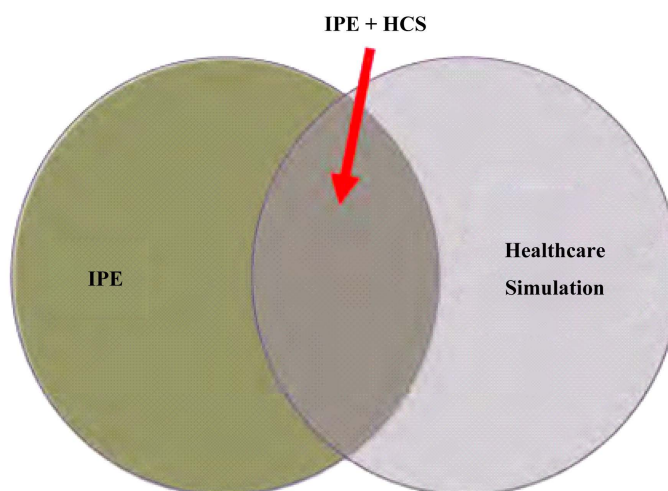


Figure 1. Relationship and leveraging the intersection between IPE and healthcare simulation. Resource: SSH & NLN -IPE in healthcare simulation (Palagnas, 2012).

- 5) List ideal sequence of events and research ways to evaluate.
- 6) Scheduling and find valid reliability evaluation tools.
- 7) Train professions.
- 8) Focus on guide scenario and continue to evaluate the scenario outcomes.
- 9) Perform dry run establishing content validity.
- 10) Determine limitations, revise supplements and pilot run for learner group establishing scenario reliability.
- 11) Teach effective communication skills.
- 12) Work with simulation team and hold peer-to-peer feedback debriefing.
- 13) Measure and analyze data.
- 14) Report.

All activities undertaken within the IPE program are underpinned by the Curtin's IP Capability Framework, which is designed to provide a model for teaching and assessing the capabilities required to be a collaborative. The framework is designed with three core elements: client centered service, client safety and quality and collaborative practice. Client refers to the individual, family or community that is the focus of the health or social service. The three core elements are consisting of by five collaborative practices (Brewer & Jones, 2013) (see **Figure 2**);

1) Communication: The collaborative worker consistently communicates in a sensitive and professional manner demonstrating effective interpersonal skills.

2) Team function: The collaborative worker understands the principles of teamwork and group processes and their importance in providing effective IP collaboration to improve client services/care. The collaborative worker is able to participate across teams and in inter-agency work to ensure integrated service/care delivery.

3) Role clarification: The collaborative worker understands their own role and the roles of other relevant parties and uses this knowledge to improve client services.

4) Conflict resolution: The collaborative worker actively engages in addressing different perspectives among colleagues and clients in a positive and constructive manner as they arise.

5) Reflection: The collaborative worker utilizes reflective processes in order to work in partnership with clients and others to ensure safe and effective services/care. The collaborative worker addresses personal leaning needs to ensure optimal service/care provision.

Practice of simulation enhanced IPE: a) Introduction (15 minutes) b) Highlight the uses of simulation for IPE (15 minutes) c) Play the scenario-based blended learning sessions in IP groups (30 minutes), d) Reflect on the potential teamwork for use in simulation experiences, e) Discuss the good and bad points of simulation for IPE in the debriefing section (15 minutes).

In this process, health care students are assigned voluntarily to a patient case, then students was divided into teams of three groups randomly who worked together during scenario. Before the scenario student are oriented



Figure 2. Curtin's IP capability framework. Resource: Brewer & Jones, 2013. *An IP practice capability framework focusing on safe, high quality client centered health service. Journal of Allied Health. 42(2): 45-49.*

to the scenario. Additionally, students facilitate throughout simulation experiences by facilitator. Each case has planned roles—two primary registered nurses and other one play a supportive role, a team lead who could be called as an extra resource, a family member who serve as a source of patient information via a written script, and an allied health staff member who could perform a range of activities such as delivery, obtaining laboratory results. The instructor runs the mannequin computers during the scenario. Immediately, following the simulation facilitator conducted a debriefing as a reflective activity. Eventually participants and observers take part in the debriefing session. This process is repeated for subsequent clinical scenarios, thus allowing students to create meaningful IP teams. The videotapes from debriefing sessions are analyzed for time spent on discussion related to simulation objectives and the application of learning to practice. At the end of the simulation session, the students complete the post-training questionnaire, which focused on their perceptions of simulation effectiveness (Decker et al., 2008; Brewer & Jones, 2013; Ryan et al., 2010). The levels described equate approximately for IPE practice with the following; focus upon the development of professional attributes and behaviors in level 1, evidence based practice in levels 2 and 3, and leadership and entrepreneurialism in level 4.

3.3. The Benefits of Simulation-Enhanced IPE

The simulation-enhanced IPE provides a realistic educational approach and standardized experience that can promote teamwork. This approach allows to learn from mistakes, and to avoid patient harm. The findings of the review revealed the benefits of IPE included the development of IP knowledge and skills, and changes in attitudes. Students find IPE most valuable when it involves opportunities for face-to-face small-group discussion with peers from other professional schools. Therefore, IPE has been a growing part of the curricula in colleges of medicine and nursing for decades (Howkins & Bray, 2008). Several students noted that they were more comfortable with another profession after the IPE activities. Sharing patient data helps them develop decision making, and problem solving with decreased stress. In addition, students are more prepared for collaborative practice before they enter healthcare settings there is the potential for enhanced patient safety and satisfaction, improved patient outcomes. Nursing and medical students reported feeling more prepared for future non-technical skills such as IP roles and communication skills to improve patient safety during simulation experiences (Couto et al., 2015; Ellis et al., 2008; Vyas et al., 2012). In the study, significant positive improvements were seen in nursing students' responses (of these, 11% were pharmacy students, 46% were medical students and 26% were nursing students) on the post-course survey of knowledge, skills, attitudes and job satisfaction. Over 90% of students reported that simulation increased their understanding of IP roles and the importance of communication (Paul et al., 2014). In a different study, based on the student's feedback it was recommended that revisions be made to include more information regarding their IP roles. Other research reported that simulated IPE enhanced IP communication, self-confidence and cultural awareness in nursing and medical students (Baker et al., 2008). Despite positive reports with many enjoying teamwork-learning activities, integration of IPE into the clinical education remains limited. Accordingly, simulated teamwork presents still many barriers that can impact IPE (Jeffries, 2005; Palagnas, 2012; IPECEP, 2011).

3.4. The Challenges of Simulation-Enhanced IPE

Barriers commonly cited to the integration of IPE include; differences in professional language and culture, preconceived ideas of professionals, curriculum structures, and staff attitudes and beliefs regarding teaching and education. Furthermore, other cited barriers to IPE in education include administrative/faculty resistance to change, role confusion, insufficient time, resources, contemporary curricula, co-located health professions programs, accreditation requirements, and research on the performance of teamwork practice (Jeffries, 2005; Howkins & Bray, 2008). Cultural diversity between healthcare professionals and patients present another challenge in this area. Participants have varying needs and varying level of experience. In particular, observing learner passively follow participant students during simulation. Debriefing IP teams remains a challenge in health care education and practice. Additionally, standardized self-evaluation tools are needed to assess professional values in simulation (Howkins & Bray, 2008). There are several factors that are essential to the success of IPE. Some of the challenges may be eliminated using potential strategies during teamwork activities. IPE initiatives require novel learning environments, innovative teaching methods, and diverse active - learning activities (IPECEP, 2011).

The strategies should be person centered and that different professions should value the diversity they bring to

IPE. Administrative support is vital in the collaborative approach include confirm mentor availability, submit attendances and grades, and find substitutes when necessary. The management, staffing, teaching and clinic systems are explored to identify the steps that were undertaken to facilitate IPE (IPECEP, 2011). Additionally, faculty availability and expertise, a change in the staff culture, time, and budgetary issues are constraints that need to be addressed to ensure successful IPE models. Various partnerships with agencies can help reduce these expenses and develop IPE materials (Howkins & Bray, 2008). Coordination of IP experiences may require significant changes in the curriculum structure of one or more colleges. Curriculum administrators or education committees must be supportive of these activities to achieve adoption of the IPE standards and examine personal assumptions, knowledge and skills relative to healthcare simulation. Faculty development work must be intentional and model a team approach. IPE requires practitioners to articulate their roles within the IP team and to their clients. In this respect, IPE is an innovation that health care professionals should be educated using standardized language when sharing knowledge. The facilitator should plan the processes ahead of the teamwork to maintain a positive atmosphere that encourages open communication. Group members should have positive expectations and should be made aware of group similarities and differences to develop an initial understanding of each other's professional roles. Communication can be demonstrated as a core competency for all health professionals. The facilitators from each disciplinary are needed to provide curricular mapping, as well as coordinating activities between different programs and develop plans for meetings, case discussions, feedback from students. To create successful IPE must have clear formative learning objectives with detail timeline. After clarity about purpose of the IPE is determined, educators are better able to decide the most appropriate methodology, equipment and technology. They also consider the level of students participating in simulation enhanced IPE that can help determine priorities for both the professionals. The second issue to consider is the educators has to provide an opportunity for all students to participate in the specific learning needs by using various alternatives and continue to monitor their progress (AHRO, 2008; Paige, 2009).

Electronic health records (EHR) may also be used to enhance teamwork for good communication skill. IP teams review live, real time patient records with EHR to involve protocols and the roles of the patient and family as part of the team within simulation enhanced IPE. Some simulations associated with teamwork require little technology. IPE activities involving students do not need to be held in a high fidelity simulation in order to be successful. Facilitators can assist the students to develop evaluation for simulation training by asking questions. For example, "What did the client achieve/learn in the session? What did you learn from that session? What theoretical knowledge did you use during the session? What do you need to learn or find out about before the next session?". Debriefing barriers can be addressed will empower attendees to translate theory into practice at IPE organizations. Measurement of student outcomes should follow a standardized procedure using valid and reliable tools. The Team-based Objective Structured Clinical Exams, Objective Structured Clinical Examination and Team STEPPS model should be used to guide development of the simulation. Self-evaluations should be compared between groups on students' perception and readiness towards IPE. Many students should access e-mail, online knowledge through student-friendly media (e.g. book, website, and social media) to achieve more progress and provide to stimulate change. Professions are encouraged to explore further studies so that IPE can be effectively engineered into the simulation. Especially, identification of the most effective simulation technique to enhance IP collaboration needs to be addressed. Organizations can support cross-disciplinary IP research in the area as well as dissemination of best practices in simulation enhanced IPE (Ryan et al., 2010; Vyas et al., 2012; Paul et al., 2014).

4. Conclusion

Simulation has been showed to be an innovative method to enhance the competencies associated with IPE. It appears that adding the IPE to simulations as a part of curriculum gives students the opportunity to provide safer care. Although the use of literature reports of simulation may help to bridge the gap for teamwork, additional well-designed studies are necessary in this area to work toward full integration of simulated IPE and to figure out how to develop an evidence base regarding the effectiveness of simulated IPE.

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