Review:
Measuring the Impact of Interprofessional Education (IPE) on Collaborative Practice and Patient Outcomes

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Acknowledgements

• It is a privilege to be here today to represent the UVA IPE team.

• I would like to acknowledge the expert work of
  – Elayne K Phillips PhD, RN, FAAN (EKP)
  – Jessica K Malpass PhD, RN (JKM)

• I would also like to acknowledge the expert editing of John Owen EdD, MSc
Outline of this Presentation

1. State the objectives of this review
2. Briefly describe the criteria and rationale for study inclusion
3. Discuss the data collection and analysis process
4. Provide an overview of the results
5. Describe study limitations and challenges
6. Suggest a framework for measuring the impact of IPE on practice and patient outcomes
Objectives of this Review

The objectives of this review are to:

1. examine the currently best-available methods used for measuring the impact of IPE on collaborative practice, patient outcomes, or both;

2. describe the challenges to conducting high-quality research that seeks to link IPE interventions with measurable changes in practice and patient outcomes.
Two review authors (EKP and JKM) jointly reviewed 2347 abstracts retrieved by the searches to identify all those that met the following criteria

- **Types of studies:**
  - Randomized Controlled Trials (RCT)
  - Controlled Before and After (CBA) studies
  - Interrupted Time Series (ITS) studies
  - Uncontrolled Before and After (BA) studies

- **Types of participants:** Healthcare Professionals
Criteria for Considering Studies

- **Types of Outcome Measures**
  - Objectively measured patient outcomes
  - Objectively measured practice process outcomes
  - Subjective (self-reported) outcomes included only when objective measures also reported

- **Type of IPE Interventions**
  - More than one healthcare professional
  - Interactive
  - Aimed at collaboration skills and team-based care to improve practice/patient outcomes
Data Collection and Analysis

Abstracts were excluded if:

1. the interprofessional intervention lacked a concrete educational component;

2. interprofessional activities involved only students;

3. learning outcomes were the only outcomes measured; or

4. reported outcomes included only feelings, beliefs, attitudes or perceptions
Data Collection and Analysis

Forty-seven studies were identified and the full text obtained for these as well as the fifteen articles from Cochrane review. These articles were then independently reviewed by three authors (EKP, JKM, VLB) using an appraisal tool.
# Rating for UVa Review

**Appraisal Tool: Level**

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>Type of Study</th>
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<tbody>
<tr>
<td>LEVEL I</td>
<td>Randomized Controlled Trial (RCT) or Experimental study</td>
</tr>
<tr>
<td>LEVEL II</td>
<td>Quasi-Experimental (no manipulation of independent variable may have Random Assignment or Control)</td>
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<tr>
<td>LEVEL III</td>
<td>Non-Experimental (no manipulation of independent variable; includes descriptive, comparative, and correlational studies; uses secondary data)</td>
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<tr>
<td>LEVEL III</td>
<td>Qualitative (exploratory [e.g., interviews, focus groups]) starting point for studies where little research exists; small samples sizes; results used to design empirical studies)</td>
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### Rating for UVa Review

**Appraisal Tool: Things to Consider**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
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| **A - HIGH** | Consistent, generalizable results  
Sufficient sample size  
Adequate control  
Definitive conclusions  
Consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence |
| **B - GOOD** | Reasonably consistent results  
Sufficient sample size for the study design  
Some control  
Fairly definitive conclusions  
Reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence |
| **C - LOW** | Little evidence with inconsistent results  
Insufficient sample size for the study design  
Conclusions cannot be drawn |
Summary of Results: Study Design

• 10 RCTs, 6 CBAs, 2 ITS, 20 BA; all were high-quality studies yet had significant methodologic limitations

• All learners were post licensure and there was a huge range of sample sizes for both learners and patient outcomes measures

• Learners mostly MD and RN, also several with PharmD, therapists, social workers and technicians.

• Settings included U.S. academic and community acute and primary care, VA, and five international studies.

• Several studies looked at long-term impact of interventions

• None looked at community/population health outcomes
Summary of Results: Patient Outcomes Measures

- Patient outcome measures for some studies included specific disease-related outcomes, length of stay, readmission rates, and morbidity, mortality.

- Many focused on specific care quality goals and patient safety issues
  - Care quality patient goals such as HgA1C, cholesterol, BP
  - Adverse events such as falls, obstetrical outcomes, infection rates, treatment or procedural delays, thromboembolism
  - Error rates and reporting

- Two focused on provider-patient communication

- Only four focused on patient or family satisfaction
Summary of Results: Practice Outcomes Measures

• Practice outcomes measures included clinical decision making, behaviors related to patient safety and error reporting, use of checklists, adherence to guidelines, organization of care and specific care competencies.

• Several included direct observation of teamwork behaviors at the point of care.

• Two included initial observation in simulation followed by observation in the clinical setting.

• Several looked at care efficiency; only one directly reported costs.
Summary of Results: Tools

- Clinical database
- OR reports
- Incident/Error reports
- Validated observational tools
- Press Ganey
- Tools of own design
Summary of Results: IPE Interventions

- Modified Crew Resource Management (CRM)
- Modified TeamSTEPPs with or without simulation
- Mostly in-house design (some not well described)
- Only a handful were in-situ
Summary of Results: Findings Related to SOT priorities

• Care quality
  – Positive impact on practice processes such as use of checklists, OR briefings, and adherence to best practices reported in the majority of studies
  – Team training almost always implemented as one part of a more comprehensive approach to practice changes (e.g. procedure manuals, mandatory OR briefings, checklists, new reporting systems)
  – Many studies looked at care processes only (no patient outcomes)
  – Specific patient care quality outcomes such as HgbA1C, cholesterol, BP, and mobility after stroke improved in four studies
  – Morbidity and mortality changes most often reported in L & D and OR settings
Summary of Results: Findings Related to SOT priorities

- **Patient Safety**
  - Adverse outcomes – mixed results; selected outcomes improved but other outcomes not improved; inconsistent within and across studies; difficult to discern a pattern
  - Error rates declined in two studies, error reporting increased
  - Studies in L & D and OR most often resulted in increased safety
  - Improvements in “safety culture” a common outcome but not always correlated with decreased errors or adverse outcomes.
Summary of Results: Findings Related to SOT priorities

• **Patient Satisfaction**
  – Improved significantly in two out of four studies
  – Family satisfaction improved in one out of one studies.

• **Costs**
  – Indirect measures of costs via care efficiencies reported
  – One study directly measured costs and reported significant improvements (surgical patients)
Characteristics of Studies with Positive Patient and Practice Outcomes

• High learner participation rates or self-selection to intervention group

• Combination of IPE with goal-specific education (teamwork+ taskwork)

• Combination of IPE with other changes in practice processes

• Use of simulation and videotaping

• Repetition of IPE interventions with regular feedback to learners

• Correlation of IPE intervention with observed and measurable changes in teamwork behaviors/skills
Overview of Methodologic Limitations

1. Inability to control for differences between control and intervention study groups
   a. Even large RCT’s fraught with methodologic challenges (e.g. differences between sites, lack of concealed allocation, inadequate blinding, selective outcome reporting)
   b. Large studies not feasible for many

2. Inadequate control for multiple other simultaneous practice changes that affect patient outcomes
   a. Combination of IPE with practice changes may be most effective in improving patient outcomes
   b. But still worth studying impact of IPE alone due to the challenges involved in implementing effective IPE
Overview of Methodologic Limitations

3. Rationale for choice of outcomes measures poorly described and lack of adequate timeline to document sustained changes outcomes
   a. The heterogenous nature of these studies and suspected selective reporting makes it difficult to discern patterns that might suggest which practice and patient outcomes are most likely to be positively impacted
   b. Several studies reported a decay in practice improvements with time – need to know if/when retraining is needed

4. Paucity of evidence for patient-centered changes in care
   a. Need to better link changes in practice and outcomes with patient experience of care.
   b. New tools needed
Overview of Methodologic Limitations

5. Poor description of participants (how many, which disciplines) and lack of clarity if those trained together actually work as a team in the practice setting
   a. Difficult to discern if outcomes are dependent on a “critical mass” of trained individuals on “ad hoc” teams
   b. More research is needed to optimize IPE and teamwork practices given the “fluidity” of teams.

6. Lack of adequate description of the type and quality of the IPE intervention as a significant variable influencing outcomes
   a. Lack of standardized evidence-based and competency-focused programs
   b. Makes compiling/comparing studies virtually impossible
Overview of Methodologic Limitations

7. Lack of evidence that teamwork training resulted in improved teamwork behaviors prior to assessing clinical outcomes
   a. Difficult to conclude that training impacted patient outcomes unless changes in behavior are documented
   b. Proportion of studies assessing behaviors increasing
   c. Based on this review, using more simulation may be helpful

8. Lack of studies addressing cost outcomes (business case)
   a. Indirect efficiency outcomes helpful but going the next step to directly measure costs would speak more loudly
   b. Need to be sure patient outcomes do not suffer
Suggested Framework for Future Studies

• **Study Type:**
  – Conduct large scale controlled studies which minimize confounding variables;
  – When this is not possible, consideration should be given to conducting well-designed ITS with careful monitoring of the study cohort to account for other variables that may impact outcomes.

• **Outcomes Measures**
  – Choose objective, relevant provider and patient outcome measures
  – Choose measures prospectively and report all results.
Suggested Framework for Future Studies

• **Study Timelines**
  – Collect pre-intervention and post-intervention data at multiple time points over several years
  – Implement the IPE intervention at a defined time and adequately isolated from other practice changes.

• **Optimize IPE interventions**
  – Ensure that the IPE intervention is theory-, evidence-, and competency-based
  – Provide adequate instructor/faculty development
  – Incentivize learner participation
**Suggested Framework for Future Studies**

- **Assessment of patient-centered team-based care**
  - More research into how teamwork affects the patient experience
  - Create new tools

- **Observe and measure team-behaviors** in the actual practice setting prior to collecting practice or patient outcomes data.
  - Creates much stronger link between training and outcomes
  - Work with National Center to develop and implement shared measures of teamwork competencies so studies can be compared
Questions?