Team Training and Patient Outcomes

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IOM
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  o Dana L. Joseph, PhD
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  o Heidi B. King, M.S.

  • For full paper results, see
Agenda

• Why is IPE Important?

• What is team training?

• Does team training in healthcare work?

• Describe the results of a comprehensive meta-analysis

• Gaps & Future Directions

• Questions/Comments
Inter-professional collaboration

- Interprofessional collaboration is recognized as essential
- Collaborative care models are being developed and applied
- Improved patient safety and satisfaction (Kearney, 2008)
- Improve skills in giving quality health care to patients and their families
- New found respect for other professionals
  - Manageable workload
  - Colleagues support exchange of ideas, skills, and knowledge
- Studies show that it reduced patient morbidity and mortality (Cadell et al., 2007)
What is team training?

• **Team Training IS...**
  o A family of learning strategies
  o The systematic acquisition of teamwork KSAs
  o Focus on cognitive, behavior, and/or affective team-based change
  o Planned activity
  o Based on pedagogical principles

• **Team Training is NOT...**
  o A group of people in front of a mannequin
  o A place, program or workbook
  o Not just saying “do better”
How do we define an inter-professional team

- **Interprofessional Team**: A team that is composed of members from different professions/occupations (e.g. Nurse, Physician, Tech) with varied and specialized knowledge, skills, and methods.

- **Interdisciplinary Team**: A team that is comprised of members from two or more disciplines (e.g. cardiology, emergency medicine, obstetrics)
Does Team Training in Healthcare Work???
What We Know…

• Widely accepted team training programs
  o TeamSTEPPS, Crew Resource Management, Crisis Resource Management
  o Team training is effective (Salas et al., 2008)

• How do we know these programs are effective for healthcare?
  o Reviews of the literature (Baker, Gustafson, Beaubien, Salas, & Barach, 2005; Buljac-Samardzic, Dekker-van Doorn, van Wijngaarden, & van Wijk, 2010; Cumin, Boyd, Webster, & Weller, 2013; Eppich, Howard, Vozenilek, & Curran, 2011; Gordon, Darbyshire, & Baker 2012; Gough, Hellaby, Jones, & MacKinnon, 2012; Manser, 2009; Merien, Van de Ven, Mol, Houterman, & Oei, 2010; Weaver et al., 2010)

  Where is the empirical evidence?
A Meta-Analysis on Team Training in Healthcare
What is Meta-Analysis?

• An advanced statistical procedure used to determine a “true” effect
  o Gather research studies examining the relationship of interest
  o Aggregate statistical data across studies
Methodology

• Databases
  o UCF OneSearch, ScienceDirect, Pubmed, PsycINFO, OVID, Medline, Google Scholar, EBSCOhost, Business Source Premier, Academic Search Premier

• Search terms combined the following:
  o Team training, teamwork training, team leadership, team communication, etc.

• Inclusion Criteria
  o Trained team skills in healthcare setting or with a healthcare population
  o Empirical
  o Experimental with effect size
  o Appropriate design to calculate Cohen’s d
    • Pre-post/Independent groups

• Followed All PRISMA Guidelines
How do we determine Training Effectiveness?

Kirkpatrick’s Model of Training Evaluation

**Level 1 – Reaction**
Did the participants like the training? What do they plan to do with what they learned?

**Level 2 – Learning**
What skills, knowledge, or attitudes changed after training? By how much?

**Level 3 – Behavior / Training Transfer**
Did the participants change their behavior on-the-job based on what they learned?

**Level 4 – Results**
Did the change in behavior positively affect the organization?

**Level 5 – Return on Investment-Patient Outcomes**
State of the Science of Medical Team Training

- **100** Independent Samples, **87 studies** were included in the meta-analysis
  - Military clinicians-2
  - Nonmilitary clinicians-76
  - Students-18
  - Mix-4
- Most frequently used team training program is **Crew Resource Management** (22%)
- Most teams trained are **interprofessional** (74%) but **interdisciplinary** teams were minority (28%)
- **Communication** was the competency most commonly trained (88%)
**What Did We Find?**

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1. $K$ is the number of effect studies analyzed for this outcome
2. $N$ is the number of individuals evaluated in this outcome
3. Corrected $d_{RM}$ is the corrected effect size estimate

*Statistically significant; confidence interval excludes zero
What Do the Data Mean?

- Team training improves overall outcomes by 9.5%.
- Team training is well-liked and perceived as useful 9.5%.
- Team Training accounts for 21.2% of learning.
- 10.08% of improvement of on-the-job performance.
  - This includes both task and team performance.
- Team training accounts for 3.1% of improvement in organizational outcomes (e.g., culture, turnover, financial).
- Team training accounts for 4.42% of improvement in patient outcomes (e.g., infection, mortality, complications).
**Does Interprofessional team training work?**

We meta-analytically examined inter-professional and interdisciplinary team training outcomes

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IPE Effectiveness

- **Overall**, MTT is **as effective** for interprofessional and interdisciplinary teams ($k=74, d_{rm}=0.61; k=28, d_{rm}=0.59$) as it is for homogeneous teams ($k=17, d_{rm}=0.78; k=45, d_{rm}=0.58$)

- However, a deeper dive shows that MTT is more effective for non-interdisciplinary and non-interprofessional teams for **learning, and transfer of training**.

- No difference for **reactions**, organizational **results**, and **patient outcomes**
Trainee Demographics

While training was effective for all types of trainees*. 

- Practicing non-military clinicians benefit most overall (corrected $D_{RM} = 1.197$).
- Students experience greater increase in learning (corrected $D_{RM} = 1.387$).
- Military clinicians benefit slightly less (corrected $D_{RM} = 0.339-1.008$).

*Note: Few studies report using a military sample (k=3) and primarily focused on practicing non-military clinician samples.
Components of Team Training

• Duration of training positively predicts learning (corrected $D_{RM}=1.00$)
  o Longer training sessions improved learning*

• Opportunities to practice predicts team training effectiveness (corrected $D_{RM}=0.870$)
  o Improves learning (corrected $D_{RM}=0.958$) and
  o Behavioral transfer (corrected $D_{RM}=0.992$)

*Note: Not all training content was delivered within the same day.
Training Strategies: Leveraging Simulation

• All training strategies are effective
  o Simulation *enhances* training learning outcomes (corrected $D_{RM}=.833$)
  o Using combined training strategies with simulated practice, information, and demonstration is *more* effective than *simulation alone* for *learning* (correct $D_{RM}=1.34$), *behavioral transfer* (corrected $D_{RM}=1.44$) and *organizational outcomes* (corrected $D_{RM}=0.484$)
What do these results mean?

- Team Training works for inter-professional teams but it is more difficult than for homogenous teams.
  - Current strategies for IPE in team training require closer examination.
  - Enhance methodologies for interprofessional and interdisciplinary team training.

- Improve organizational conditions for on-the-job use of teamwork for interprofessional teams.

- Interprofessional teamwork should be trained early!

- Leverage Simulation but use it with other strategies
Gaps & Future Directions

• Majority of studies used post-licensure samples
  o Studies should start evaluating IPE earlier on in medical education
  o Team experiences early in training will carry over to on the job attitudes.

• Few studies examine sustainability of team training
  o We need more studies that evaluate team training over time

• Future research should evaluate interprofessional vs. uni-professional team training

• Significant heterogeneity among studies in terms of methods for evaluating training programs

• Not all primary studies provided explicit information on the components of training, so there was missing information for several moderator analyses.

• Need to examine Virtual team training

• Few Patient outcomes reported
  o Research in IPE should emphasize and quantify impact on patients
IPE and Patient Outcomes

The cost of not embracing interprofessional teamwork are significant!

Research on IPE must continue to uncover the most effective ways to:

1. Develop
2. Implement, and
3. Evaluate IPE programs
Thank You!

• QUESTIONS?
• COMMENTS?
Interprofessional teamwork

“Coming together is a beginning. Keeping together is progress. Working together is success.”

~Henry Ford
References

References


References

## Reactions

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*p<.05  **p<.001
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*p < 0.05 **p < 0.001
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The Current State of Interprofessional Education (IPE) in Team Training

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Some Qualitative Findings

- Findings (partial list)

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*% of articles that reported this information
Coding Methodology

- 6 trained coders systematically extracted information, double coded
- Effect sizes
  - Converted into $d_{rm}$
- Outcomes of interest Kirkpatrick’s levels of training evaluation
  - Reactions
  - Learning
    - Skills
    - Knowledge
  - On-the-Job Performance (Transfer of training)
  - Organizational Results (e.g., turnover, staff satisfaction)
  - Patient Outcomes (e.g., patient health)
    - Mortality
Analyzing the Data

- Hedges & Olkin (1985) approach
  - Pre-post and independent groups studies
  - Meta-analyzed Cohen’s $d$
- Converted all effect sizes to repeated measures Cohen’s $d$
  - Morris & DeShon (2002) formula allows conversion from independent groups $d$ to repeated measures $d$
Need for Inter-professional team training

“An essential component of patient-centered primary care practice is inter-professional teamwork. High-functioning teams require collaboration between physicians, nurses, pharmacists, social workers, clinical psychologists, case managers, medical assistants, and clinical administrators…(Department of Veterans Affairs, ”August 26, 2010, p. 2)
Definitions

- **Interprofessional Education (IPE):** Learning occurring when two or more professions (e.g. MD, Nurse, technician) learn with, from and about each other to improve collaboration and the quality of care" (CAIPE, 2002). Effective Interprofessional education improves quality of patient care, focuses on the needs of the learners and learners are active participants in assessing, planning, delivering, and evaluating IPE.

  - **Interprofessional Team:** As defined in the Institute of Medicine’s (IOM) Report, Health Professions Education: A Bridge to Quality, (2003) an interdisciplinary (Interprofessional) team is “composed of members from different professions and occupations with varied and specialized knowledge, skills, and methods.” (p. 54) Members of an Interprofessional team communicate and work together, as colleagues, to provide quality, individualized care for patients.

  - **Interdisciplinary Team:** A team that is comprised of members from two or more disciplines (e.g. cardiology, emergency medicine, obstetrics)

- **Teamwork** is defined as the interaction and relationships between two or more health professionals who work interdependently to provide safe, quality patient care. Teamwork includes the interrelated set of specific knowledge (cognitive competencies), skills (affective competencies), and attitudes (behavioral competencies) required for an interprofessional team to function as a unit (Salas, DiazGranados, Weaver, and King, 2008).
Team Performance

Cognitions
- Knowledge
  - “Think”

Behaviors
- Skills
  - “Do”

Attitudes
- Affect
  - “Feel”
IPE team training in healthcare

- Inter-professional team training is an essential part of educating the next generation of leaders in the health-care field:
  - **Attitudes**: Instill the importance of interdisciplinary team work.
  - **Behaviors**: Educate team members on the team skills necessary to achieve shared goals
    - Mutual Support
    - Communication
    - Situation Monitoring
  - **Cognitions**: Attain a shared understanding of inter-professional goals
    - Shared Mental Models
    - Transactive Memory Systems
What is the current state of team training?

- Training Design and Features
  - Training lasted an average of 8.66 hours
  - Most frequently used team training program is **Crew Resource Management** (22%)
  - Lack of reporting or use of needs analysis (17.4%)
  - **Communication** competency most commonly trained (n=96, 88%)

- Trainee characteristics
  - Most commonly trained students were medical students, not nursing (n=8)
  - Most training for practicing clinicians occurred in **surgical units** (n=16), **obstetric units** (n=12), or throughout the healthcare facility (n=15)
Features of Training Coded

- **Moderators (Partial list)**
  - Sample type (e.g., clinicians, students)
  - Type of training program (e.g., TeamSTEPPS, crew resource management, etc.)
  - Duration of training (in hours)
  - Training strategy employed (information, demonstration, practice)
  - Who designed the training (e.g., internally developed, government association, etc.)
  - Who delivered the training (i.e., internal or external trainer)
  - Type of needs analysis conducted
  - Number of practice sessions
  - **Interdisciplinary teams (i.e., interdisciplinary team training)**
Barr’s (1998) three types of professional competencies:

- **Common Competencies**
- **Individual Professional competencies: Complementary**
- **IP Collaborative Competencies**