Assessment of Medical and Nursing Student Perceptions of Team Training

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Objectives of presentation

• Describe pedagogies used in interdisciplinary team training to improve quality and safety.

• Examine the results of a large scale project measuring the outcomes of interdisciplinary team training with nursing and medical students across two universities.
We can’t hope to make lasting change in the ability of health care systems to improve without changes in the way we develop future health professionals. Those changes require faculty and schools to change.

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- Joey Woodyard
Framework for the study

- Institute of Medicine Quality Chasm report on changes needed in health professions education and impact of human factors

- Quality and Safety Education for Nurses (QSEN) definition for Teamwork and Collaboration:
  - Function effectively in inter-professional teams, fostering open communication, mutual respect, and shared decision-making to achieve quality patient care

- Nursing Outlook, May-June 2007
Project Aims: Interprofessional Safety Education Consortium (IPSEC)

1. Provide senior SOM & SON students an interdisciplinary patient safety focused teamwork experience

2. Randomized control design to evaluate interactive teamwork training scenarios

3. Engage and train faculty in teaching patient safety and teamwork skills
Curriculum: First student use TeamSTEPPS
Team Strategies and Tools to Enhance
Performance and Patient Safety

Multi-media public domain curriculum from AHRQ to teach team coordination KSAs
Developed by the Department of Defense
### Teamwork and Collaboration Example

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe examples of the impact of team functioning on safety and quality of care</td>
<td>Follow communication practices that minimize risks associated with handoffs among providers and across transitions in care</td>
<td>Appreciate the risks associated with handoffs among providers and across transitions in care</td>
</tr>
<tr>
<td>Explain how authority gradients influence teamwork and patient safety</td>
<td>Assert own perspective (using SBAR or other team communication models)</td>
<td>Value the influence of system solutions in achieving effective team functioning</td>
</tr>
<tr>
<td>Identify system barriers and facilitators of effective team functioning</td>
<td>Participate in designing systems that support effective teamwork</td>
<td>&quot;Nursing Outlook, May-June, 2007&quot;</td>
</tr>
</tbody>
</table>
TeamSTEPPS: Team Performance

Skills
Behaviors “Do”

Attitudes Affect “Feel”

Leadership
Communication
Situation Monitoring
Mutual Support

Knowledge Cognitions “Think”

...team performance is a science... consequences of errors are great...
Effective Team Leaders

- Organize the team
- Articulate clear goals
- Base decisions on collective member input
- Empower members to speak up and challenge, when appropriate, call a huddle
- Skillful at conflict resolution
- Team Activities:
  - Briefs – planning
  - Huddles – problem solving
  - Debriefs – process improvement
Hypotheses

1. Interactive training in a high fidelity environment will be more effective in promoting team coordination skills than training in a low fidelity environment.

2. Participation in interactive training in small groups will be more effective than in large groups.

3. Large group interactive training exercises will be more effective than training with only lectures without interactive exercises.
March 6, 2007 Duke & UNC-CH

- 438 students
- 70 faculty
- 90 volunteers
- 12 temporary workers
Design: 2 universities, 4 schools

- Instrument development to evaluate effectiveness of pedagogies pre and post intervention
- Faculty development workshop
- Interdisciplinary grouping for single day team training, N=438
- Core content 2 hour lecture
- Four randomized cohorts: lecture, ARS, role play, simulation
Four Cohorts N = 438
Matched nursing and medicine

<table>
<thead>
<tr>
<th>Small Groups, 2 strategies</th>
<th>Large Groups, 2 strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 High Fidelity Human Simulation (n = 80)</td>
<td>Lecture &amp; Audience Response (n = 139)</td>
</tr>
<tr>
<td>10 Role-Play (n = 79)</td>
<td>Traditional Lecture (n = 140)</td>
</tr>
</tbody>
</table>
4 Assessment Tools

- **Pre-Post**
  - 12-item teamwork knowledge test
  - 36-item teamwork attitudes instrument

- **10-item standardized patient (SP) evaluation of four-student teamwork skills**

- **10-item modification of Malec et al. (2007, *Sim Healthcare* 2:4-10) Mayo High Performance Teamwork Scale (HPTS).**
<table>
<thead>
<tr>
<th>Sample</th>
<th>Nursing N=196</th>
<th>Medicine N=233</th>
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<tbody>
<tr>
<td>Gender</td>
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<td></td>
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<tr>
<td>Female</td>
<td>178</td>
<td>127</td>
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<tr>
<td>Male</td>
<td>13</td>
<td>105</td>
</tr>
<tr>
<td>Average age</td>
<td>27 yrs.</td>
<td>26.5</td>
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<tr>
<td>Ethnicity</td>
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<td></td>
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<tr>
<td>African American</td>
<td>13</td>
<td>21</td>
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<tr>
<td>Caucasian</td>
<td>157</td>
<td>152</td>
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<tr>
<td>Hispanic</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Native American</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Asian/Pac Island</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Cohort Means</td>
<td>Lecture</td>
<td>ARS</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>-----</td>
</tr>
<tr>
<td>N=140</td>
<td>N=139</td>
<td>N=79</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
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<tr>
<td>Pre-test</td>
<td>9.37</td>
<td>9.16</td>
</tr>
<tr>
<td>Post-test</td>
<td>10.38</td>
<td>10.62</td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
<td></td>
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<tr>
<td>Pre-test</td>
<td>141.4</td>
<td>139.8</td>
</tr>
<tr>
<td>Post-test</td>
<td>144</td>
<td>142.9</td>
</tr>
<tr>
<td>Skills</td>
<td>19.5</td>
<td>19.5</td>
</tr>
</tbody>
</table>
Teamwork Knowledge Results

Knowledge test results

- Simulation
- Role play
- ARS
- Lecture

Training condition

Pre-test
Post-test
Data did not support Hypotheses:

1. Interactive training in a high fidelity environment did not demonstrate more effective results in promoting team coordination skills than training in a low fidelity environment.

2. Participation in interactive training in small groups did not present as more effective than in large groups.

3. Large group interactive training exercises did not show as more effective than training with only lectures without interactive exercises.
Differences in student responses

- Nursing students had previous experiences with role play and high-fidelity simulation whereas Medical students had previous experiences with standardized patients and ARS.

- Evaluation by student satisfaction measures revealed differences across cohorts; students were significantly more satisfied with high-fidelity team training.
Next Steps: Project Aims for the Interprofessional Safety Education Consortium (IPSEC)

- Apply lessons from year 1
- Develop an exportable interactive video teaching tool requiring minimal resources.
- Implement a randomized control design to evaluate a teamwork educational intervention
- Improve faculty development for teaching patient safety and teamwork skills
- Continue instrument development
What is the impact of an educational intervention using video and interactive small groups on interprofessional teamwork KSAs?

- Questions remain about the best methods within a safety framework.
TeamSTEPPS Curriculum: Human factors, Teamwork and collaboration

• Challenges to teamwork:
  – Complex care coordination,
  – Safe handling between providers,
  – Communication across hierarchy
Content focused on

- Each Healthcare Team Member can act as a Leader
- Team Huddles and Debriefs to Problem-Solve
- Team members monitor entire patient situation
- Structured Communication – SBAR
- Callouts, Checkbacks for Accuracy, Proper patient handoffs between teams
- Mutual Support
- Assertion
Method: Experimental design

- UNC completed the project in two groups each of two days (180 each day).
- Duke spread the groups over four training sessions in three days (92 medical students and 64 nursing students).
- Faculty from both institutions met weekly to plan, recruit faculty for training to facilitate groups, and participate in the student training sessions at both sites.
March 3
Experimental Group n = 80 Medical Students and n = 80 Nursing Students at separate time. 6 groups (1B-5B, 1A) of approximately 32 students each. Each group will be further subdivided into 4 role-play groups of 8 students each. (Note: Group 1B will follow this sequence on March 3 because of Accelerated Nursing schedule)

Knowledge Test, Part One

Educational Interaction:
All n = 340 students over the course of a week:
1. Podcast followed by the Podcast Evaluation Instrument
2. Group role-play exercises (4 students on, 4 students observing/scoring the Video&RolePlay Checklist, then switch and repeat).
3. Students view and rate aspects of a prepared teamwork video scenario using a duplicate Video&RolePlay Checklist.

Knowledge Test, Part Two plus the Retrospective Teamwork Attitudes Pre-Posttest.

March 6
Control Group n = 80 Medical Students and n = 80 Nursing Students. 4 groups (2A-5A) of approximately 32 students each. Each group will be further subdivided into 4 role-play groups of 8 students each.

Control Group will receive combined Knowledge Test, Parts One and Two, as well as the Retrospective Teamwork Attitudes Pre-Posttest.

Control Group Finished

Experimental Group Finished

Course Evaluation
Design

- All students completed the pre-test and then participated in a one hour TeamSTEPPS Podcast/Webcast lecture

- Divided into small groups with trained facilitators to apply a case study using low fidelity simulation role-play, complete a rating scale to complete a video-rating, and participate in feedback discussions, and then complete the post-test.

- Experimental group: completed the post-test instruments after the interactive exercises

- Control group: 
  - completed the post-test instruments before completing the interactive exercises.
Sample

- 46.2% medicine,
- 45.9% nursing,
- 9.9% other health professions
- 68.9% female
- 70.8% Caucasian,
- 12.1% African American,
- 17.1% other population groups
- average student age 27.2 +/- 5.2 years
Small group activity

- 8 students per group were evenly divided by role, each was led by a trained faculty facilitator and completed the same activities.

- 4 students enacted the role play of a case study while the other 4 students observed and completed the Video & Role Play Checklist and then switched.

- Each group viewed a teamwork video from TeamSTEPPS and used a duplicate Video & Role Play Checklist.
Instruments

– Teamwork attitudes
  • 36-item Collaborative Healthcare Interdisciplinary Relationship Planning (CHIRP)

– Teamwork knowledge
  • 10-item Teamwork Knowledge scale

– Podcast evaluation

– Case study video rating scale observing teamwork skills
Sample CHIRP Attitudes Items

<table>
<thead>
<tr>
<th>I do not agree at all</th>
<th>I somewhat agree</th>
<th>I fairly much agree</th>
<th>I very much agree</th>
<th>I completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>My Attitude Before Activity</th>
<th>My Attitude After Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I must consider the interests of every professional, patient, and family member involved in a medical decision.</td>
<td>1 2 3 4 5 1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Pharmacists, nurses, physicians, social workers and other health care professionals are of equal importance in providing patient care.</td>
<td>1 2 3 4 5 1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
## Sample Webcast Evaluation Items

<table>
<thead>
<tr>
<th>I do not agree at all</th>
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<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statement</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should work at recognizing multiple sources of potential errors in every patient case.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>It is okay for team members to monitor each other’s actions.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Each healthcare team member should challenge a decision if they are uncomfortable with it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>The podcast made me rethink my approach to patient care.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>The podcast was useful for my professional development.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Estimated Marginal Means of MEASURE_1

- **NURSES V MEDICAL STUDENTS**
  - MEDICAL STUDENTS
  - NURSING STUDENTS

- **Estimated Marginal Means**
  - Time 1: 60.00
  - Time 2: 62.00
  - Time 3: 64.00
  - Time 4: 66.00
Estimated Marginal Means of MEASURE_1

NURSES V MEDICAL STUDENTS

Estimated Marginal Means

MEDICAL STUDENTS
NURSING STUDENTS

Estimated Marginal Means

7.50
8.00
8.50
9.00
9.50

1
2

time
Results

• Both groups improved at the same rate

• Nurses improved at higher levels than medicine

• Achieved the goals of
  – Improve Communication
  – Improve Respect for other Disciplines
  – Improve Patient Safety
Implications

• Using the communication tools in planning sessions *really did work*...briefing, debriefing, SBAR, check back, appropriate assertion, mutual support and situation awareness facilitated our process.

• It is unclear whether video only will have the same long term impact as the inclusion of interactive role play.

• TeamSTEPPS can be successfully adapted for student training
Outcomes

• TeamSTEPPS training added to the nursing and medical school curricula at UNC and Duke

• Created lasting collaborations within and between the two universities

• Developed instruments

• Produced a TeamSTEPPS training video/podcast.

• IPE Courses developed in each school
Challenges and Opportunities

Faculty have choices in designing curricula

Differences in

– Schedules
– Competing priorities
– Program content & sequencing
Future Study

• Which methods promote sustained behavior change over time?

• When is the best time to place in the curriculum?

• Which are the best matches for level of education across the health professions?

• What instruments are needed to produce more discreet metrics?
Even a single day has an impact.

Thanks, GlaxoSmithKline Foundation of North Carolina