Psychometric Validation of the Modified Comprehensive Assessment of Team Member Effectiveness Tool for Health Science Graduate Students

Karishma Chhabria, MPH, Erik Black, PhD and Amy V. Blue, PhD
Teamwork is an intrinsic component of interprofessional collaboration
– Domain of both IPEC and CIHC interprofessional collaborative competency frameworks
Providing students interprofessional teamwork learning opportunities imperative
Background

• Need for rigorous assessment of interprofessional collaborative competencies

• Measuring teamwork
  – Perceptions of members; observations by others
  – Team as a whole; as individuals
  – Associated outcomes

• Students’ teamwork
  – Faculty; self; peers
• Peer Assessment
  – Used for students particularly in areas of professionalism
  – 360 degree for physicians and other professionals regarding interprofessional teamwork

• Few reports of peer assessment of learners as an interprofessional team
• Determine the effectiveness of a peer-assessment instrument for health professions students’ interprofessional teamwork
  – Examine the usefulness of the CATME instrument for health science students
Study Context

• Year-long interprofessional service-learning experience, “Putting Families First”
  – Interprofessional teams of 4 students with volunteer family
  – 4 home visits and health improvement project
  – 6 in-class sessions with faculty facilitators

Inaugural Program Award for Excellence in Social Mission 2016
Study Context

• Content includes social determinants of health, cultural competency, access to care

• Interprofessional competencies addressed:
  – Values and ethics for interprofessional practice
  – Roles and responsibilities
  – Interprofessional communication
  – Interprofessional teamwork

• Patient-centered engagement through interprofessional collaboration
Study Context

• Student professions (approximately 700 total each year):
  – Clinical Health Psychology
  – Dental
  – Health Administration
  – Medicine
  – Nursing
  – Nutrition
  – Pharmacy
  – Physical Therapy
  – Veterinary Medicine
Study Context

• Challenge of behavioral assessment with large number of students (i.e., 700) and teams (i.e., 175)
• Faculty do not really observe teamwork
• Peers probably have best sense
  – How to manage process in a meaningful manner?
Use of CATME

• Comprehensive Assessment of Team Member Effectiveness (CATME)
• Online peer assessment system
• Based on teamwork science, used in undergraduate education and team-based learning
Study Methods

• Students from 2014-2015 and 2015-2016

• 3 CATME items
  – Contributing to Team’s Work (“C”)
  – Interacting with Teammates (“I”)
  – Keeping the Team on Track (“K”)

Scored on 5 point behaviorally anchored rating scales: poor, average and exceptional behaviors
### Study Methods

#### Behavioral anchor rating scale example

<table>
<thead>
<tr>
<th>Contributing to the Team’s Work</th>
<th>Rating: Rank frequency and intensity of your teammates by placing a mark in the relevant box.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Does more or higher-quality work than expected.</td>
</tr>
<tr>
<td></td>
<td>• Makes important contributions that improve the team’s work.</td>
</tr>
<tr>
<td></td>
<td>• Helps to complete the work of teammates who are having difficulty.</td>
</tr>
<tr>
<td></td>
<td>Demonstrates behaviors described in the row just above and just below.</td>
</tr>
<tr>
<td></td>
<td>• Completes a fair share of the team’s work with acceptable quality.</td>
</tr>
<tr>
<td></td>
<td>• Keeps commitments and completes assignments on time.</td>
</tr>
<tr>
<td></td>
<td>• Fills in for teammates when it is easy or important.</td>
</tr>
<tr>
<td></td>
<td>Demonstrates behaviors described in the row just above and just below.</td>
</tr>
<tr>
<td></td>
<td>• Does not do a fair share of the team’s work. Delivers sloppy or incomplete work.</td>
</tr>
<tr>
<td></td>
<td>• Misses deadlines. Is late, unprepared, or absent for team meetings.</td>
</tr>
<tr>
<td></td>
<td>• Does not assist teammates. Quits if the work becomes difficult.</td>
</tr>
</tbody>
</table>
Methods

• 3 question team satisfaction survey
  • I am satisfied with my present teammates
  • I am pleased with the way my teammates and I work together
  • I am very satisfied with working with this team
  • 5 point Likert type scale: strongly disagree to strongly agree

• 2015-2016 Psychological Safety questions added (Edmondson’s 7 questions)
Methods

• Students accessed CATME mid-point (Dec):
  – Self and anonymous peer assessment
• Students returned to CATME and reviewed evaluations (Jan)
• Students accessed CATME at end (April)
  – Self and anonymous peer assessment
Methods

- Descriptive statistics
- Item analysis, including item difficulty
- Inter-item correlations to test for redundancy
- Cronbach’s alphas for internal consistency for both administrations during each year.
- Exploratory factor analysis for 2014-2015
- Confirmatory factor analysis for 2015-2016
- Cumulative scoring used for each team member
Results

• Respondents:
  • At least one completed CATME peer evaluation: 655 (93.9%) 2014-2015 and 696 (98.1%) 2015-2016
  • Teams with all members completed evaluations: 516 (78.8%) 2014-2015 and 451 (64.8%) 2015-2016
  • Evaluation of missing-ness: no correlations to gender, year or program
## Results – Team Items

<table>
<thead>
<tr>
<th>Team Competencies</th>
<th>2014-2015</th>
<th>2015-2016</th>
</tr>
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<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td><strong>Team Competencies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C - Contributing (S)</td>
<td>4.55 (0.71)</td>
<td>4.60 (0.36)</td>
</tr>
<tr>
<td>C - Contributing (F)</td>
<td>4.24 (1.25)</td>
<td>4.59 (0.33)</td>
</tr>
<tr>
<td>I - Interacting (S)</td>
<td>4.59 (0.66)</td>
<td>4.59 (0.34)</td>
</tr>
<tr>
<td>I - Interacting (F)</td>
<td>4.25 (1.23)</td>
<td>4.53 (0.29)</td>
</tr>
<tr>
<td>K - Keeping (S)</td>
<td>4.52 (0.73)</td>
<td>4.57 (0.34)</td>
</tr>
<tr>
<td>K - Keeping (F)</td>
<td>4.18 (1.25)</td>
<td>4.50 (0.30)</td>
</tr>
</tbody>
</table>

F=Fall; S=Spring administrations
### Results – Team Items

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<tr>
<td></td>
<td>Mean (SD)</td>
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</tr>
<tr>
<td>I am satisfied with my present teammates (S)</td>
<td>4.64 (0.72)</td>
<td>4.73 (0.62)</td>
</tr>
<tr>
<td>I am satisfied with my present teammates (F)</td>
<td>4.40 (1.27)</td>
<td>4.75 (0.59)</td>
</tr>
<tr>
<td>I am pleased with the way my teammates and I work together (S)</td>
<td>4.62 (0.73)</td>
<td>4.12 (0.65)</td>
</tr>
<tr>
<td>I am pleased with the way my teammates and I work together (F)</td>
<td>4.38 (1.26)</td>
<td>4.72 (0.63)</td>
</tr>
<tr>
<td>I am very satisfied with working in this team (S)</td>
<td>4.59 (0.78)</td>
<td>4.69 (0.68)</td>
</tr>
<tr>
<td>I am very satisfied with working in this team (F)</td>
<td>4.32 (1.31)</td>
<td>4.70 (0.64)</td>
</tr>
</tbody>
</table>

F=Fall; S=Spring administrations
Results - Correlations

• Strong correlations among team competency items (.70-.89) and team satisfaction (.90 -.96)
Results

• Test retest reliability was confirmed using formative and summative data for the 2015-2016 data
  • (C=0.325, P=0.00; I=0.339 P=0.00; K=0.405 P=0.00).

• Concurrent validity assessed between psychological safety, and team satisfaction with the team competencies.
  • Evidence of moderate to strong correlations.
Results – Factor Analysis

90% of variance associated with 1 factor

C
K
I

T
“Teamness”
Discussion

• Results suggest CATME is a valid and reliable tool for health professions students’ peer assessment of teamwork behaviors.

• Global teamwork satisfaction items appear to capture valid measures of effective teamwork.

• Psychological safety items related to effective teamwork (as expected).
Limitations

• Missing data not imputed; a conservative strategy for non-response selected; large sample size however.
• Validation only focused on a subset of CATME items.
• CATME calibrator function not used.
• Students’ work not in a clinical context – future research could explore this.
Conclusion

• Measuring students’ longitudinal interprofessional teamwork challenging, particularly with large groups.
• Peer assessment possible approach.
• CATME appears to be an efficient, effective method.
  • Brief, online, student-driven
References


