Investigation of the Reliability of a Clinical Teamwork Observation Measure for an Interdisciplinary Team Training Program

Justin Berk, MPH (SOM, MS1) Coby Ray (SOM, MST)
Faculty Mentor: Sharon Decker, RN, PhD

Background
As the increasing complexity of healthcare delivery increases demand for collaboration among diverse medical personnel, interdisciplinary communication and teamwork has become a core competency in producing positive health outcomes. Seminal research on cross-disciplinary teamwork has begun and suggests teamwork training (specifically, TeamSTEPPS®) can improve care delivery in the fields of trauma care (Capella et al, 2010), operating room surgeries (Armour Forse, Bramble, and McQuillan 2011), surgical and pediatric intensive care (Mayer et al. 2011), and general patient safety culture and staff knowledge, skills, and attitudes (KSA) regarding teamwork and collaborative working relationships, teamwork, interprofessional communication, shared leadership, self-awareness, and evaluation (Bainbridge et al. 2010). Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS™) is a systematic framework, developed by the Department of Defense and the Agency for Healthcare Research and Quality, to integrate teamwork into practice. The program is “designed to improve the quality, safety, and the efficiency of healthcare.” (Henrikse et al. 2008)

Methods
This is a pilot single-blinded non-randomized control study, designed to better understand the reliability of a new interdisciplinary communication tool: the Clinical Teamwork Observation Measure in the setting of simulated medical scenarios. 6 Teams of 3-5 interdisciplinary health professional students will be divided into two groups: an interventional arm and a control arm. All teams from both arms asked to perform simulated medical scenarios (“SimWARS”). A team of untrained “raters” will then observe the interactions of the team (one time) and score the team’s level of clinical teamwork using the Clinical Teamwork Observation Measure (CTOM) and the TeamSTEPPS® Teamwork Perceptions Questionnaire (T-TPQ). Following the initial simulation, teams in the interventional arm will participate in the TeamSTEPPS training program and repeat the same simulated medical simulation. Teams in the control arm will repeat the scenario without completing the teambuilding training course. Thus, a total of 12 recording will be used in analysis. All the simulations will be video recorded. The evaluator group (blinded to both the order of the simulations and the team study arms) will consist of 4 raters (N=48). The raters will evaluate the CTOM to quantitatively assess each team performance in the categories of Communication, Situation Awareness/Monitoring, Evidence-Based Team Decision Making, Collaboration, and Mutual Support. The T-TPQ scale will also be used to assess teamwork. This will allow us to correlate the results of the CTOM tool with the current TeamSTEPPS standard of measuring teamwork competency. Statistical analysis will be conducted to measure inter-rater reliability through intra-class correlation and Cohen’s kappa coefficient. Correlational studies will likewise be conducted to determine the level of concurrence among the CTOM scale and the T-TPQ scale. Additional analysis will involve t-test comparison of difference in means in order to determine whether teams in the interventional study arm showed greater improvement in their team performance ratings than the control arm.

Discussion
If high inter-rater reliability is established by the study, the CTOM could serve as a universal tool for untrained individuals in a simulation setting. This ensures minimal training, if any, which would be necessary to adapt the CTOM measure across diverse simulation or clinical settings. If a high correlation is established with the gold standard tools in the field of collaborative practice (specifically the TeamSTEPPS® Teamwork Perceptions Questionnaire (T-TPQ)) then the CTOM will serve as an appropriate alternative to the current measures available. Furthermore, we hope the CTOM will ultimately be a more useful tool because of improved ease of use and higher inter-rater reliability.

A tool such as the CTOM could be implemented outside of a simulation setting to allow supervisors or healthcare institution quality improvement departments to measure interdisciplinary teamwork in various clinical departments. In doing so, administrators and educators can identify areas of deficiency in interdisciplinary teamwork and communication. Such data can offer insight to ensure continuing medical education programs are accurately and effectively targeting areas of weakness within interdisciplinary teamwork competencies.

There are several limitations in our study. First, the simulation scope of this study may not adequately apply to real-world clinical settings. Second, our study only utilizes nursing and medical students, therefore the results may not apply to other disciplines. Finally, without a structured and replicable simulation environment, the results may not be reproducible in all settings. Ultimately, an efficient and reliable measure such as CTOM can monitor and evaluate interdisciplinary teamwork, which will spotlight sites of practical improvement to enhance health outcomes in a clinical setting.

Objectives
While implementing a new teamwork observation tool, we hope to:
- Determine inter-rater reliability of the tool
- Determine correlation with other gold standard measures
- Determine the tool’s ability to detect TeamSTEPPS training

The aim of this study is to assess the reliability of a Clinical Teamwork Observation Measure (CTOM) – an existing TTUHSC institutional observation instrument to assess the effects of training on team performance in simulated medical scenarios.

Implementation of a new interdisciplinary communication requires robust inter-rater reliability, therefore, this study seeks to determine the consistency among raters’ subscale and overall clinical teamwork scores. Additionally, our study will assess the correlation between CTOM results with other gold standard tools in the field of collaborative practice, specifically the TeamSTEPPS® Teamwork Perceptions Questionnaire (T-TPQ).

Finally, we will measure the tool’s ability to record the expected changes in clinical teamwork scores after clinical simulation teams receive formal TeamSTEPPS training.

References and Acknowledgements:
Sorel, Katrina; Estes-Bruner; Timothy J; Schabath; Sue Eoy; Christy J; Fisher; Robert J; Adams; and Conard W. 2008. “Teams Communicating Through STEPPS.” The Medical Journal of Australia 188 (11) Supplement: S6–S12.

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Figure 1. TeamSTEPPS logo
http://www.albq.edu/teamsteppstools/images/bkg01med.jpg