

OBJECTIVE

Evaluate the reliability and validity of

- Mayo High Performance Teamwork Scale (MHPTWS)
- Ottawa Crisis Resource Management Global Rating Scale (Ottawa GRS)

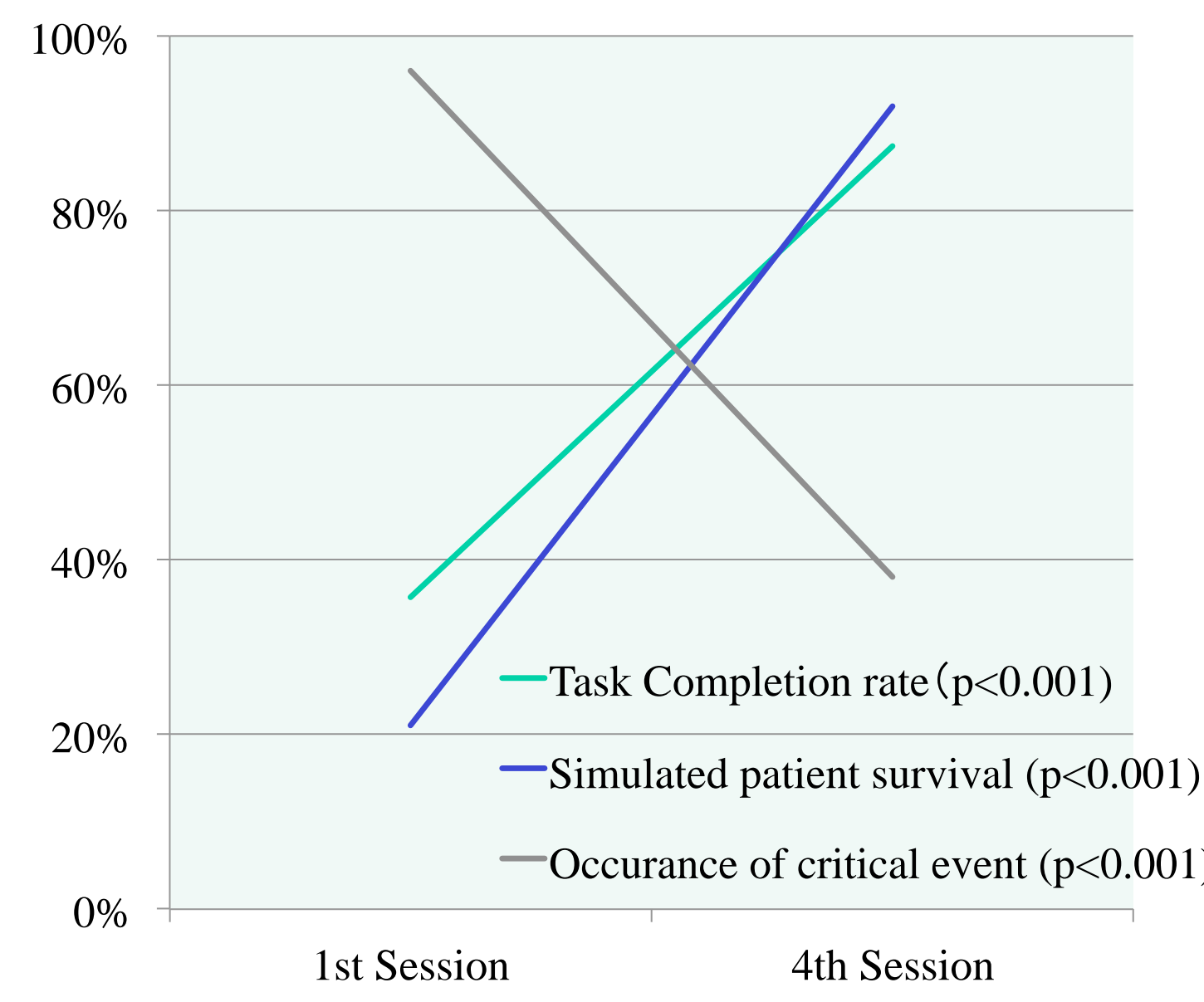
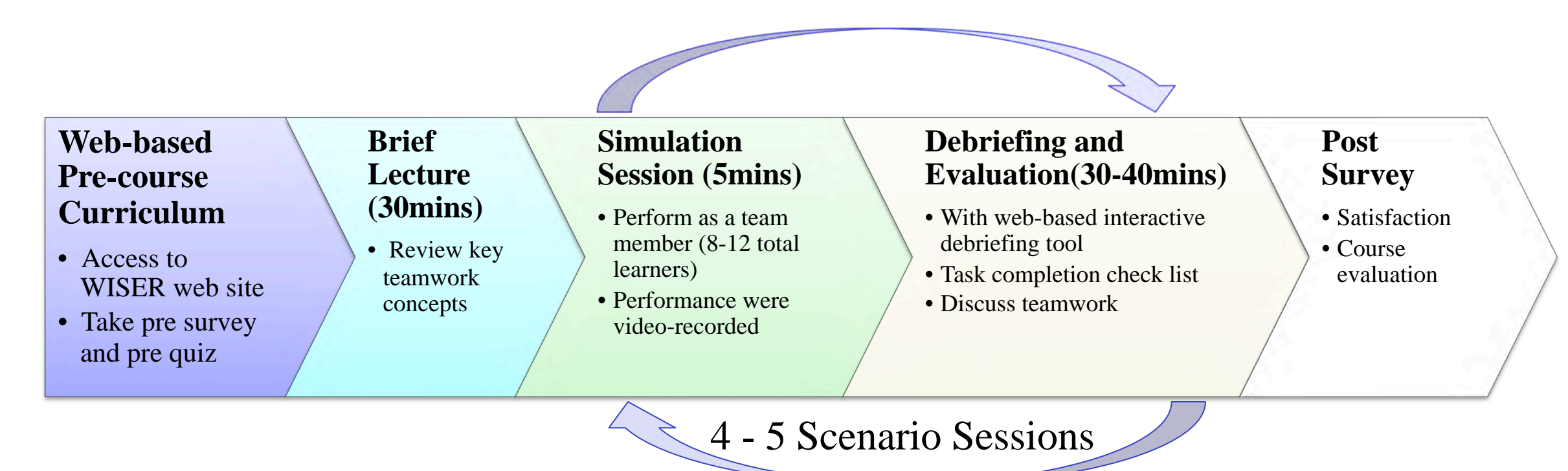
in a Crisis Team Training (CTT) course at WISER

INTRODUCTION

- Evaluation is a key component of simulation education
- Evaluation of team training with simulation is challenging (AMEE Guide No. 82. Med Teach. 35:10 e1511-30. 2013)
- Development of reliable and validated assessment instruments requires considerable time and effort
- Several non-technical skill or team performance assessment tools have been developed and used in various settings
- MHPTWS was developed to assess teamwork skills in CRM training (Malec et al. Sim Health vol.2 No.1 2007)
- Ottawa GRS is a reliable and valid assessment tool in team training (Kim et al. Crit Care Med 2006 vol. 34. No.8)
- Goal: assess utility and generalizability of MHPTWS and Ottawa GRS to evaluate CTT team performance

BACKGROUND

Crisis Team Training Course Overview



Improvement of performance in CTT

Airway Manager	
● Assess oxygenation/ventilation	
● Consider need for intubation	
● Check Pupils	
● Communicate findings to treatment leader	
Airway Assistant	
● Set up pulse ox	
● Check pulse ox reading	
● Report Pulse ox to Airway manager	
● Cricoid pressure	
● Learn airway plan from Airway Manager	
● Assemble needed equipment	
Bedside Assistant	
● Place back board	
● Check vital signs	
● Check pulse ox	
● Report vital signs to data manager	
● Verify Pads attached to defibrillator	
● Adjust IV rate	
● Deliver medications	
Crash Cart Manager	
● Verify EKG on defibrillator	
● Report EKG to Treatment leader	

Sample Task Checklist

METHODS

Raters

- **Novice Raters:** Four U. Pitt nurse anesthetist students with prior experience as participants in simulation courses
- **Expert Raters:** Four experienced simulation instructors at SimTiki simulation center ; U. Hawaii School of Medicine

Audiovisual Recordings

- 52 CTT courses : February 2007 to April 2012

Video review:

- Randomized blind sequence of 1st and 4th CTT scenarios
- MHPTWS : Two novice raters and two expert raters
- Ottawa GRS : Two novice raters and two expert raters

Assessment Tools

- MHPTWS
- Ottawa GRS

Standardized Rater Training

- 1.5 hours
- Brief orientation to CTT
- Review of assigned instrument
- Practice evaluation with 3 sessions
- Same training for novices and experts

Data Collection

- iPad data entry to iForm@: Downloaded to Excel
- SPSS statistical analysis

Statistical Analysis

◆MHPTWS

- Inter-rater reliability: Kappa statistic
 - Novice - Novice
 - Expert - Expert
 - Expert - Novice
- Validity: paired t-test
 - 1st session compared to 4th session

◆Ottawa GRS

- Inter-rater reliability: Interclass correlation coefficients
 - Novice - Novice
 - Expert - Expert
 - Expert - Novice
- Validity: paired t-test
 - 1st session compared to 4th session

RESULTS

◆MHPTWS

Table 1. MHPTWS inter-rater reliability Kappa Statistic

Question	Novice - Novice	Expert - Expert *	Novice - Expert
Kappa (95% Confidence Interval)			
1.A leader is clearly recognized by all members	0.33 (0.16, 0.49)	0.40 (0.08,0.72)	0.20 (0.04, 0.35)
2.The team leader assures maintenance of an appropriate balance between command authority and team member participation	0.35 (0.19, 0.51)	0.29 (0.05, 0.53)	0.40 (0.26, 0.55)
3.Each team member demonstrates a clear understanding of his or her role	0.38 (0.21, 0.56)	0.21 (-0.08, 0.51)	0.16 (0.01, 0.32)
4.The team prompts each other to attend to all significant clinical indicators throughout the procedure/intervention	0.35 (0.18, 0.52)	0.27 (0.03, 0.51)	0.22 (0.06, 0.38)
5.When team members are actively involved with the patient, they verbalize their activities aloud	0.18 (0.03, 0.32)	0.38 (0.15, 0.61)	0.15 (0.06, 0.25)
6.Team members repeat back or paraphrase instructions and clarifications to indicate that they heard them correctly	0.40 (0.26, 0.55)	0.36 (0.13, 0.59)	0.30 (0.18, 0.42)
7.Team members refer to established protocols and checklists for the procedure/ intervention	0.33 (0.05, 0.61)	0.03 (-0.03, 0.09)	0.55 (0.30, 0.80)
8.All members of the team are appropriately involved and participate in the activity	0.20 (0.02, 0.37)	0.25 (-0.04, 0.55)	0.32 (0.02, 0.37)

Table 2. MHPTWS score 1st session vs. 4th session

	1 st Session Scores	4 th Session Scores	Paired t-Test
Novice A	8.69±3.49	11.90±2.15	P<0.0001
Novice B	8.80±3.67	11.53±2.47	P<0.0001
Expert A	7.80±3.64	11.38±2.58	P<0.0001
Expert B *			

◆Ottawa GRS

Table 3. Ottawa GRS inter-rater reliability interclass correlation coefficient (ICC)

Question	Novice - Novice	Expert - Expert	Novice - Expert
ICC (95% Confidence Interval)			
Overall Performance	0.39 (0.33, 0.47)	0.45 (0.41, 0.51)	0.58 (0.55, 0.61)
1.Leadership Skills	0.38 (0.33, 0.46)	0.32 (0.26, 0.43)	0.52 (0.49, 0.56)
2.Problem Solving Skills	0.35 (0.29, 0.44)	0.44 (0.40, 0.50)	0.51 (0.47, 0.55)
3.Situational Awareness Skills	0.36 (0.31, 0.45)	0.45 (0.41, 0.51)	0.52 (0.49, 0.57)
4.Resource Utilization Skills	0.33 (0.27, 0.43)	0.42 (0.38, 0.49)	0.56 (0.54, 0.59)
5.Communication Skills	0.41 (0.36, 0.48)	0.44 (0.40, 0.50)	0.38 (0.33, 0.40)

Table 4. Ottawa GRS score 1st session vs. 4th session

	1 st Session Scores	4 th Session Scores	Paired t-Test
Novice C	3.53±1.29	5.14±1.46	P<0.0001
Novice D	4.31±1.08	4.64±0.85	P=0.06
Expert C	3.23±1.03	4.86±1.25	P<0.0001
Expert D	3.06±1.35	4.39±1.11	P<0.0001

*The expert to expert inter-rater reliability for the MHPTWS was evaluated in 29 of 104 sessions. Due to the small number of sessions evaluated by Expert B, the 1st and 4th session comparisons are pending rating of the remaining videos.

DISCUSSION

- There is only average inter-rater reliability for both instruments
- Our modest inter-rater reliability in our study was equivalent to the original validation of Ottawa GRS
- Both instruments were able to significantly detect differences in team performance between the 1st and 4th scenarios
- Both tools seem to perform similarly in ability to detect differences between our simulation scenarios of CTT

CONCLUSION

- The MHPTWS and Ottawa GRS could be used to assess team performance in simulation training scenarios by both novice and expert evaluators, however more work needs to be done to look at inter-rater reliability

REFERENCES

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