Early Assessment of Competency-Based Preceptor Evaluations of Students on Clinical Rotations

Indiana University Physician Assistant Studies

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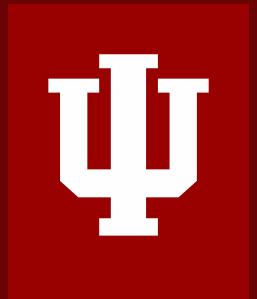

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Main Topics

Beginning to evaluate competency-based curriculum

- Why competency-based?
- First steps
- Reliability
- Fleiss' Kappa and Inter-rater reliability
- Other Considerations/Strategies

Background on Assessment of the Clinical Year at IUMPAS

What did we do before?

- *5-point Likert Scale*
- *(Strongly Agree → Strongly Disagree)*

Background on Assessment of the Clinical Year at IUMPAS

What did we change?

- *5-point Likert Scale with steps/stages of competence*
- *More specific to each competency*

Why Competency-Based Assessment?

Why did we change?

- *Feedback was highly rater-dependent*
- *Objective results of progress are important for determining whether interventions/remediations need to be made*

Why Competency-Based Assessment?

Drawbacks

- *More time consuming for preceptors*
- *Survey exhaustion? (Increased "Going down the line?)*

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Program Goals

1. Recruit highly qualified applicants who share the program values and possess characteristics to successfully complete our PA program. +
2. Promote a culture of diversity and inclusion through recruitment, curriculum design, and clinical placement. +
3. Educate students for entry-level practice to provide quality patient-centered care in a wide variety of clinical settings. +
4. Educate students to provide culturally competent and sensitive health care in the context of the communities our learners serve. +
5. Prepare students to work collaboratively and effectively with all members of the health care team. +
6. Prepare students for critical thinking and evidence-based decision-making. +

First Steps: Producing the Competencies

Based on National Standards

- *Core competencies of healthcare professionals*
- *Communication, Leadership, Professionalism, Knowledge, Business Skills*

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First Steps: Producing the Competencies

Based on Program Specific Goals

- *Cultural Competence*
- *Self Awareness/Care*

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First Steps: Producing the Competencies

Modified from Medical School Program

- *Help align our evaluation with tools given by one familiar to preceptors shared by our program and medical schools*

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Initial Evaluation

Where are we now?

- *Currently, we are gathering data from our first cohort of the new assessment tool.*

Initial Evaluation

Concerns for Inter-rater reliability

- *Does having competency-based assessment increase inter-rater reliability?*
- *Failure to meet competencies could result in deceleration of student progress*

Cohen's Kappa

Traditional statistical method for inter-rater reliability

- *Does each rater give similar scores to the same student?*
- *Would be useful if we had consistent preceptors*

Value of κ	Strength of Agreement
< 0.20	Poor
$0.21 - 0.40$	Fair
$0.41 - 0.60$	Moderate
$0.61 - 0.80$	Good
> 0.80	Very Good

$$\kappa = \frac{p_0 - p_e}{1 - p_e},$$

Cohen's Kappa

Traditional statistical method for inter-rater reliability

- *Would be more useful if we had consistent preceptors*
- *For each clinical rotation (event) our students don't have the same group of preceptors (raters)*

Value of κ	Strength of Agreement
< 0.20	Poor
$0.21 - 0.40$	Fair
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$$\kappa = \frac{p_0 - p_e}{1 - p_e},$$

Fleiss' Kappa

Better than Cohen's Kappa for pool of non-unique raters

- *Fleiss' Kappa assumes students do not have the same raters*
- *For each clinical rotation (event) one preceptor (rater) may only rate a subset of students with some non-unique overlap*

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< 0.20	Poor
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Fleiss' Kappa

Clinical Reasoning Data

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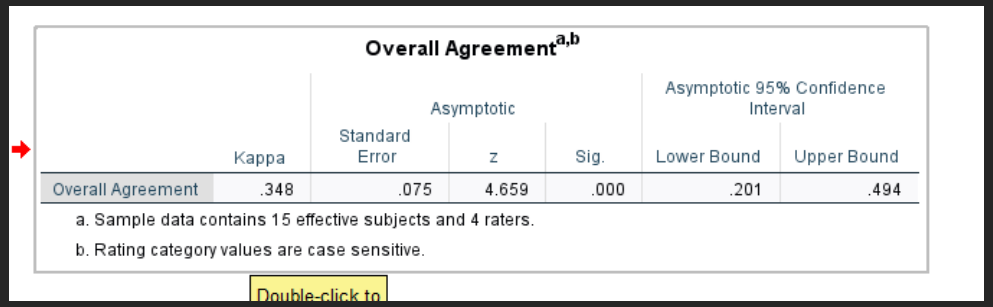
- *For each clinical rotation (event) one preceptor (rater) may only rate a subset of students*

Fleiss' Kappa



Overall Agreement[a,b]

	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
Overall Agreement	.348	.075	4.659	.000	.201	.494

a. Sample data contains 15 effective subjects and 4 raters.

b. Rating category values are case sensitive.

Double-click to

Clinical Reasoning Data

- *4 Raters*
- *95% CI = 0.201, 0.494*

Fleiss' Kappa

Medical Knowledge

- *4 Raters*
- *95% CI = 0.127, 0.413*
- *Individual Category Agreement*

Overall Agreement[a]

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Agreement on Individual Categories[a]

Rating Category	Conditional Probability	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
2.00	.000	-.017	.105	-.161	.872	-.224	.190
3.00	.471	.261	.105	2.479	.013	.055	.468
4.00	.519	.125	.105	1.182	.237	-.082	.331
5.00	.622	.496	.105	4.708	.000	.290	.703

a. Sample data contains 15 effective subjects and 4 raters.

Fleiss' Kappa

Diagnosis

- *4 Raters*
- *95% CI = 0.285, 0.581*
- *Individual Category Agreement*

Overall Agreement[a]

	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
Overall Agreement	.433	.076	5.716	.000	.285	.581

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Rating Category	Conditional Probability	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
3.00	.718	.502	.105	4.765	.000	.296	.709
4.00	.533	.300	.105	2.846	.004	.093	.507
5.00	.619	.503	.105	4.773	.000	.297	.710

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Fleiss' Kappa

Clinical Management

- *4 Raters*
- *95% CI = 0.203, 0.496*
- *Individual Category Agreement*

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Rating Category	Conditional Probability	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
3.00	.533	.300	.105	2.846	.004	.093	.507
4.00	.444	.145	.105	1.378	.168	-.061	.352
5.00	.737	.615	.105	5.833	.000	.408	.821

a. Sample data contains 15 effective subjects and 4 raters.

Fleiss' Kappa

Social Skills

- *4 Raters*
- *95% CI = 0.203, 0.496*
- *Individual Category Agreement*

Overall Agreement[a]

	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
Overall Agreement	.261	.075	3.490	.000	.114	.408

a. Sample data contains 15 effective subjects and 4 raters.

Agreement on Individual Categories[a]

Rating Category	Conditional Probability	Kappa	Asymptotic Standard Error	Asymptotic z	Asymptotic Sig.	Asymptotic 95% Confidence Interval Lower Bound	Asymptotic 95% Confidence Interval Upper Bound
3.00	.392	.152	.105	1.441	.150	-.055	.358
4.00	.400	.100	.105	.949	.343	-.107	.307
5.00	.696	.506	.105	4.805	.000	.300	.713

a. Sample data contains 15 effective subjects and 4 raters.

Fleiss' Kappa

Better reliability?

- *Possibly?*
- *Confounding issues*

	Fleiss' Kappa	Significance	95% CI Lower Bound	95% Upper Bound
History and Physical Taking	0.348	*P*< .001	0.201	0.494
Medical Knowledge	0.27	*P*< .001	0.127	0.413
Creating a Differential	0.433	*P*< .001	0.285	0.581
Management	0.349	*P*< .001	0.203	0.496
Recognizing Social Determinants	0.261	*P*< .001	0.114	0.0408
Oral Presentation	0.264	*P*< .001	0.116	0.413
Written Documentation	0.309	*P*=.001	0.16	0.0457
Interaction with Patients and Families	0.237	*P*=.001	0.094	0.381
Interaction with members of the health care team	0.286	*P*< .001	0.136	0.436
General Professionalism	0.317	*P*< .001	0.175	0.459

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Increasing Reliability After Data Collection

Creating subsets of raters

- *By specialty*
- *By competency*

Control "Student"

Increasing Reliability After Data Collection

Grouping by Specialty

- *EM*

Overall Agreement[a,b]

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Increasing Reliability After Data Collection

Grouping by Specialty

- *General Surgery*

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0.81-1.00	Very good

Increasing Reliability After Data Collection

Grouping by Specialty

- *Primary Care*
  - Family Medicine
  - Pediatrics
  - Internal Medicine (Outpatient)

Value of κ	Strength of agreement
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0.21-0.40	Fair
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Increasing Reliability After Data Collection

Grouping by Competency

- *Medical Knowledge*
- *Diagnosis*
- *Clinical Management*
- *Social Skills*

Value of κ	Strength of agreement
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Discussions

Comparisons to Subjective Assessment

- *More/Less reliability?*

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Discussions

Student Strength

- *Are strong (more competent) students less likely to have inter-rater inconsistency?*

Discussions

Survey Exhaustion

- *Is the same rater more are less subject to “going down the line”*

Discussions

Survey Exhaustion

- *Does the number or surveys submitted change “going down the line”*

What next?

Competency-based assessments may be more objective but how objective can evaluators in the clinical setting be?

Comparisons of competencies to summative evaluations before and after clinical year

Transition of the didactic year to competency assessment

References

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2. Taylor & Francis. 2021. Building a competency-based workplace curriculum around entrustable professional activities: The case of physician assistant training. [online] Available at: <https://www.tandfonline.com/doi/full/10.3109/0142159X.2010.513719>

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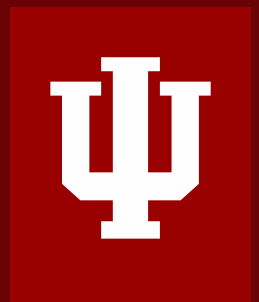
4. Lohenry, K., Brenneman, A., Goldgar, C., Hills, K., VanderMeulen, S., Lane, S., Ziegler, O., Barwick, T. and Fletcher, S., 2017. Entrustable Professional Activities. Journal of Physician Assistant Education, 28(1), pp.33-40.

Thank you

Any Questions?



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