Exploring the Relationship Between Demographic Factors and Accuracy of Anesthesiology Residents' Self-Assessments of Clinical Competencies

UNC SCHOOL OF MEDICINE

Fei Chen PhD, Emily Teeter MD, Adriana Ruby Gaona BS, Robert Isaak DO
Department of Anesthesiology, University of North Carolina at Chapel Hill

INTRODUCTION

- Accurate self-assessment is critical for self-directed learning, clinical competency development, and patient safety.
- In general, its challenging for residents to accurately assess their own performance[1-4]
- Studies on the relationship between demographic characteristics and self evaluation are scarce.
- This study aimed to examine the accuracy of residents' self-assessment of clinical competencies and investigate the gender- or race-related discrepancies in competency assessment.

- **Research Questions**
  - Is there any gender/race difference in terms of CCC assigned scores?
  - Is there any gender/race difference in terms of self-assessment scores?
  - Is there any gender/race difference in terms of the accuracy of assessment, as measured by the difference between the self-assessment and CCC assigned scores?

METHODS

- This retrospective study analyzed Accreditation Council for Graduate Medical Education milestone scores and self-assessments from clinical anesthesiology residents at a single institution over six academic years (Dec 2015 - Jun 2021).
- Semi-annual Clinical Competency Committee (CCC) assessments and resident self-assessments were compared to measure self-assessment accuracy. Data were analyzed using mixed-effects ANOVA and Tukey's test.

Table 1. Characteristics of residents (N=117)

Characteristics	N	(%)
Gender		
Female	46	(39.3)
Male	71	(60.7)
Race		
Asian	18	(15.4)
Black of African American	7	(6.0)
Hispanic, Latino, or of Spanish Origin	7	(6.0)
White	78	(66.7)
Other	7	(6.0)

Table 2. Comparison between self-and faculty-assessments on Anesthesiology Milestones by Competency and Time

		SA		CCC		Dif		
Competency	Time	Mean	SD	Mean	SD	Mean	SD	P value*
PC	3	22.028	5.94	14.464	1.135	7.725	5.933	**<.0001**
	4	27.043	5.362	19.799	1.626	7.243	5.429	**<.0001**
	5	29.813	5.03	25.39	1.507	4.396	5.351	**<.0001**
	6	33.174	4.876	29.604	1.071	3.558	4.97	**<.0001**
	7	37.029	4.397	34.93	1.584	2.086	4.612	**0.0003**
MK	3	1.937	0.621	1.261	0.357	0.676	0.61	**<.0001**
	4	2.621	0.699	1.951	0.358	0.664	0.706	**<.0001**
	5	2.938	0.605	2.39	0.336	0.549	0.582	**<.0001**
	6	3.268	0.645	2.951	0.377	0.319	0.612	**<.0001**
	7	3.65	0.567	3.225	0.412	0.429	0.677	**<.0001**
SBP	3	4.507	1.596	3.021	0.132	1.486	1.606	**<.0001**
	4	5.371	1.348	3.993	0.351	1.379	1.314	**<.0001**
	5	5.757	1.144	5.329	0.435	0.424	1.093	**0.0016**
	6	6.63	1.059	6.535	0.506	0.101	1.083	0.4393
	7	7.3	1.001	7.338	0.412	-0.043	0.932	0.7015
PBL	3	9.465	2.661	7.056	0.532	2.408	2.649	**<.0001**
	4	11.05	2.557	9.181	0.539	1.864	2.522	**<.0001**
	5	12.083	2.044	11.171	0.641	0.889	1.941	**0.0002**
	6	13.572	2.024	13.313	0.507	0.268	1.973	0.263
	7	14.829	1.841	15.063	0.77	-0.243	1.916	0.2927
PROF	3	13.458	3.983	7.817	0.581	5.641	3.995	**<.0001**
	4	14.921	3.278	10.056	0.674	4.857	3.203	**<.0001**
	5	15.229	3.139	12.534	0.733	2.667	3.087	**<.0001**
	6	17.261	2.787	14.938	0.65	2.319	2.733	**<.0001**
	7	18.4	2.819	17.408	1.073	0.993	2.794	**0.0041**
ICS	3	7.556	2.444	3.042	0.203	4.514	2.436	**<.0001**
	4	8.55	2.068	4.049	0.267	4.5	2.036	**<.0001**
	5	9.104	2.037	5.116	0.328	3.986	2.01	**<.0001**
	6	10.174	1.778	6.063	0.365	4.101	1.748	**<.0001**
	7	10.843	1.684	7.176	0.471	3.664	1.654	**<.0001**
Total	3	58.951	16.136	36.71	1.889	22.754	15.889	**<.0001**
	4	69.557	14.346	49.028	2.688	20.507	14.034	**<.0001**
	5	74.924	12.924	61.932	2.745	12.91	12.76	**<.0001**
	6	84.08	12.202	73.403	2.16	10.667	12.005	**<.0001**
	7	92.05	11.459	85.141	3.556	6.886	11.597	**<.0001**

Note: Time =3: December (mid-year)of CA1, Time=4: June (year-end) of CA1, Time=5: December of CA2, Time=6: June of CA2, Time=7:December of CA3. SA = Self-assessment, CCC= CCC assigned score, Dif = score difference between SA and CCC scores (SA minus CCC). *SD=standard deviation,* * based on paired t-test comparing SA and CCC.

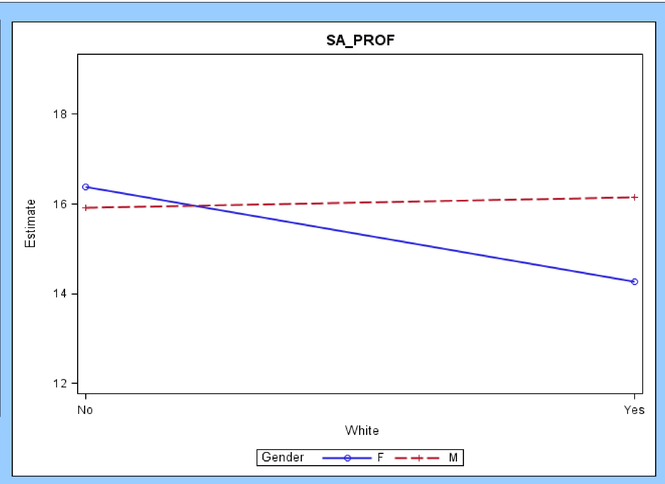

Fig. 1 Interaction between gender and race on resident self-assessment (SA) on professionalism milestone competency (PROF).

Legend: Gender: F=female, M=male. White=race being white or Caucasian. Estimate=estimated mean SA score.

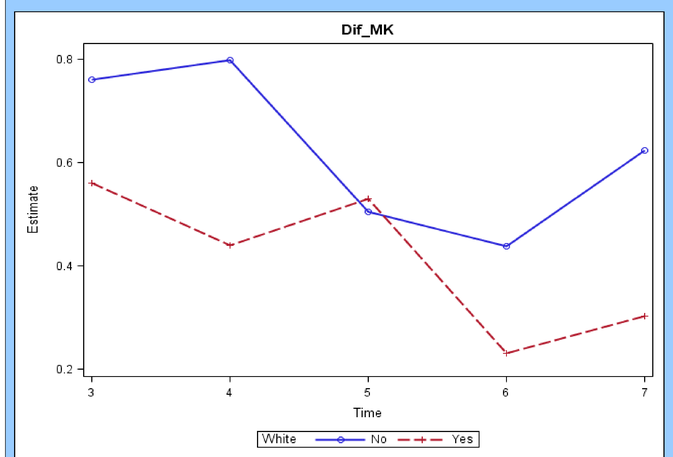

Fig. 2 Resident self-assessment (SA) accuracy on medical knowledge milestone competency (MK) over time by race.

Legend: Dif_MK= difference score calculated by subtracting CCC score from SA score. White=race being white or Caucasian. Estimate=estimated mean of the difference in score. Time =3: December (mid-year)of CA1, Time=4: June (year-end) of CA1, Time=5: December of CA2, Time=6: June of CA2, Time=7:December of CA3.

RESULTS

- The sample included 17,773 sub-competency ratings from 117 residents, with no significant gender or race effects on CCC scores.
- Self-assessment scores showed a significant gender-race interaction in professionalism milestones, with female white residents rating themselves lower than their peers.
- Residents generally overestimated their competencies compared to CCC scores, with notable improvement in self-assessment accuracy over time, except for interpersonal and communication skills.
- White residents' self-assessment was closer to CCC's evaluations of their medical knowledge than the non-white residents.

CONCLUSION

- Our study investigated the underexplored area of gender and racial biases in residents' competency-based assessments.
- The observed differences in self-assessment suggest that further research is warranted to explore the impact of personal characteristics on competency assessment and to develop targeted interventions for improving self-assessment accuracy and reducing potential biases.

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