

Use of Mentored Peer Review of Standardized Manuscripts as an Educational Tool for Neurology Residents

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Introduction

Learning to appraise scientific literature critically and apply this skill to clinical practice is an ACGME core competency or milestone (Practice-Based Learning and Improvement).

Residents lack knowledge in biostatistics necessary to interpret clinical research and more formal training is needed.¹⁻² Innovative approaches to such instruction are lacking in neurology training.

Objectives

1. Determine the feasibility of peer review of standardized manuscripts as an educational tool for neurology residents
2. Compare unstructured mentored with non-mentored peer review
3. Assess the impact of this educational intervention on (A) peer review quality and (B) resident knowledge of research methodology and biostatistics

Methods

- Partially-blinded, randomized, controlled multi-center pilot study
- Seventy-eight PGY-3 and PGY-4 neurology residents were recruited from nine training programs and five standardized manuscripts with introduced errors were distributed at two month intervals (Fig 1)
- Residents reviewed Manuscript 1, then were randomized to receive unstructured faculty mentoring or no mentoring for future reviews
- Baseline resident reviews and reviews of the final manuscript were graded by blinded assessment using a validated instrument, the Review Quality Instrument (RQI, Fig 2a).³
- Primary outcomes: change in RQI score and knowledge assessment

Table 1: Demographics

Factor	Total (n=78)
Age (yrs)	30.8 +/-2.6
Gender (% male)	39 (50%)
PGY4 (n, %)	40 (51%)
Prior Biostatistics Training (n, %)	38 (49%)
No. Prior Publications (n, %)	
- 0	32 (41%)
- 1-5	39 (50%)
- >5	7 (9%)

Figure 1: Study Schema

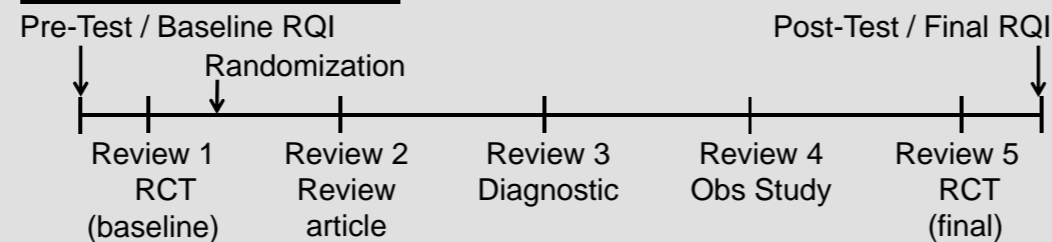


Table 2: Feasibility of Peer Review

Reviews Completed	Total (n=78)	Mentored (n=39)	Non-Mentored (n=39)
One (n, %)	66 (85%)	35 (90%)	31 (80%)
Two (n, %)	53 (69%)	26 (67%)	28 (72%)
Three or more (n, %)	45 (59%)	22 (56%)	24 (62%)

Table 3: Knowledge Assessment

Test	Percentage Correct (Mean ± SD)		P-value
	Non-Mentored	Mentored	
Pre-Test	66.2 ± 13.3	65.4 ± 13.5	0.996
Post-Test	53.9 ± 12.7	55.8 ± 13.0	0.284

Figure (2a, 2b): Review Quality Instrument (RQI)³ and Scores

Box. Review Quality Instrument

1. Did the reviewer discuss the importance of the research question?
1 Not at all, 2, 3, 4, 5 Discussed extensively
2. Did the reviewer discuss the originality of the paper?
1 Not at all, 2, 3, 4, 5 Discussed extensively with references
3. Did the reviewer clearly identify the strengths and weaknesses of the method (study design, data collection, and data analysis)?
1 Not at all, 2, 3, 4, 5 Comprehensive
4. Did the reviewer make specific useful comments on the writing, organization, tables, and figures of the manuscript?
1 Not at all, 2, 3, 4, 5 Extensive
5. Were the reviewer's comments constructive?
1 Not at all, 2, 3, 4, 5 Very constructive
6. Did the reviewer supply appropriate evidence using examples from the paper to substantiate his or her comments?
1 No comments substantiated, 2, 3, 4, 5 All comments substantiated
7. Did the reviewer comment on the author's interpretation of the results?
1 Not at all, 2, 3, 4, 5 Discussed extensively
8. How would you rate the quality of this review overall?
1 Poor, 2, 3, 4, 5 Excellent

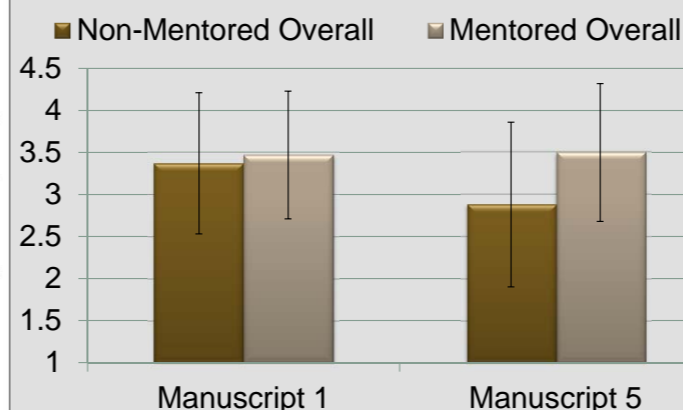
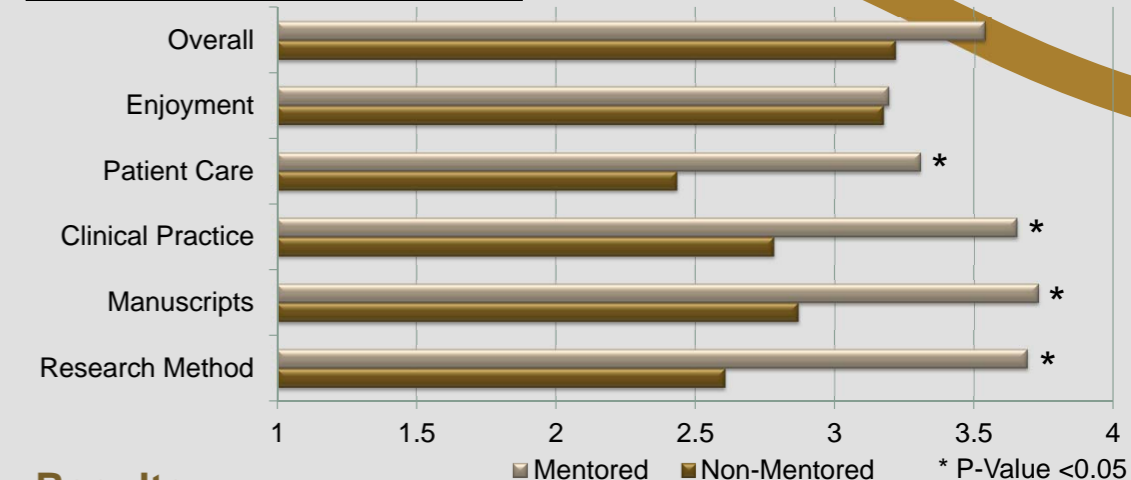


Figure 3: Resident Impressions



Results

- Baseline demographics (Table 1) were not different between groups
- Of all participants, 85%, 69%, and 59% completed 1, 2 and ≥3 reviews (Table 2)
- Mean pre- and post-test knowledge scores did not significantly differ (66% and 55% correct, respectively, p=0.28, Table 3)
- RQI scores for manuscript 5 were not significantly different in mentored and non-mentored residents (p=0.21, Fig 2b)
- Mentored residents indicated significantly greater confidence in assessing correctness of statistical procedures, greater understanding of research methodology and understanding manuscripts, greater motivation to read manuscripts, and greater comfort applying literature results to clinical practice and explaining literature to patients (all p-values <0.05, Fig 3)

Conclusions

1. Mentored peer review is a feasible educational tool to teach neurology residents principles of research methodology
2. Unstructured mentoring did not impact knowledge assessment or RQI scores but did significantly impact perceived knowledge and confidence
3. Long-term follow up and future studies employing formal mentoring curricula and varying resident time commitment are planned

References

1. Windish et al. *JAMA*. 2007;298(9):1010-22.
2. Leira et al. *Neurology*. 2008;70(20):e79-84.
3. van Rooyen et al. *J Clin Epidemiol*. 1999;52(7):625-629.