



Effectiveness of peer review

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Goals of authors and editors

- Advancement of scientific understanding and improvement in treatment and prevention of disease
- Poor research is the fault of authors
- Poor research and fraud could be less likely if research were not a career necessity for physicians

Errors in medical articles

- Poor research that has survived the peer-review process
- Peer review should weed out serious methodological errors

Functions of peer review

- Filtering out incorrect or inadequate work
- Improving accuracy and clarity of published reports

Efficacy

- Good evidence
 - Deficiencies
- Poor evidence
 - Benefits
- Expensive, slow, prone to bias, open to abuse, and unable to detect fraud

Readability of articles

- 101 manuscripts before and after peer review
- Gunning fog index and Flesch reading ease score
- Readability scores improved significantly
- But both remained difficult to read at publication
 - Roberts, Fletcher, Fletcher. JAMA 1994

Detecting mistakes

- 420 reviewers
- Modified a paper accepted for publication introducing 8 areas of weakness
- Number of weaknesses found - 2
- No differences between groups
 - JAMA 1998

Quality of peer review

- No formal training available
- Attempts to improve quality
 - Blinding reviewers
 - Rating reviewers
 - Checklists
 - Workshops for reviewers

Type of reviewer

- Author-recommended reviewers vs editor-identified reviewers
- Grades assigned by author-recommended reviewers better
 - 2-3 times more likely to assign high grade
 - Recommend publication
- Clustering of grades
- Recommended use of rating relative to other manuscripts in the same field
 - Chance, Concurrence, and Clustering
 - Reviewers' Recommendations on 1,000 Submissions to JCI

Effect of blinding reviewers

- Expectation
 - Decrease bias
- Facts
 - Better quality after blinding
 - 127 consecutive manuscripts
 - Two external reviewers
 - Blinding successful for 73%
 - Quality of reviews higher for blinded manuscripts (3.5 vs 3.1 on a 5-point scale)
 - 43% of reviewers signed their reviews
 - McNutt, Evans, Fletcher, Fletcher JAMA 1990
- Difficulty
 - Blinding reviewers, esp. in specialty journals

Masking and blinding

- 527 manuscripts in BMJ randomized
- Two reviewers
- Review quality assessed by two editors and corresponding author
- No difference in assessment between
 - Masked and unmasked groups (2.82 vs 2.96)
 - Blinded and unblinded groups (2.87 vs 2.90)
- Reviews recommending publication were scored more highly
 - Van Rooyen, Godlee, Evans, Smith, Black. JAMA 1998

Blinding on acceptance

- Blinded reviewers and editors gave better scores
- Blinded reviewers provide more unbiased reviews
 - Fisher, Friedman, Strauss. JAMA 1994

Open review

- Authors and reviewers in equal positions and for increasing accountability
- Protocols of systematic reviews on the web together with software that allows anybody to comment in a structured way—so long as they give their names
 - Cochrane

Open peer review

- Identity of authors and reviewers known
- Arguments in favor
 - Increased accountability
 - Fairness
 - Transparency
 - Leads to better quality reviews
 - No evidence that anonymous peer review is superior

Identity of reviewers known

- Increases credit and accountability
 - Most reviewers agreed to be identified, and most authors favor open peer review
- If reviewers have to sign their reviews
 - Put more effort
 - Produce better reviews
 - (?? blunt their opinions for fear of causing offence)
 - More reviewers will decline to review if their identity will be revealed to authors

Exchanging comments of reviewers

- **Indian and non-Indian reviewers**
- 100 manuscripts to pairs of peer reviewers
- Non-Indian reviewers scored higher (56.7 v. 48.6)
 - Especially those in non-exchanged group (58.4 v. 47.3)
- Training programs to improve quality of peer reviews in India.
 - **Das Sinha, Sahni, Nundy. NMJI 1999**

Training and peer review

- Intervention groups identified more errors after training (3.14 vs 2.96 vs 2.13)
- Evidence for benefit of training was not apparent on further testing six months after the interventions
- Training associated with an increased likelihood of recommending rejection (92% and 84% v 76%)

Use of checklist

- Beneficial especially to new reviewers

Postpublication peer review

Readers assume that articles in peer-reviewed journals are scientifically sound

- Evidence to the contrary
- Misleading work identified after publication
- “Ultimate interpretation and decision about the value of an article rests with the reader”
- Publishing corrections, retractions, and letters critical of articles

Quality of peer review

- Outcome measures to assess peer review
- Properly defined objectives
- Almost impossible to assess or improve its effectiveness
 - Jefferson, Wager, Davidoff. JAMA 2002

Conclusion

Is peer review beneficial?

- Yes!
- Journals should work to strengthen it
- Methodological review compulsory

- Impossible to eliminate misleading studies



But!

An imperfect peer-review system
is a safeguard without which
quality of published research
would be lower