Improving author adherence to reporting guidelines

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Introduction

Reporting guidelines are important for ensuring clear reporting and reproducibility of published research. However, authors may find it difficult to identify the guidelines which are relevant to their study. We have been working with the EQUATOR Network and Penelope Research to develop and test an automated tool to support authors in identifying the correct reporting guidelines for their study.

The objective of this study was to determine whether providing this tool on submission to a journal improved authors' identification of the correct reporting guidelines.

Methods

A prospective before-after study across four journals – *BMC Family Practice, BMC Gastroenterology, BMC Musculoskeletal Disorders* and *BMC Nephrology.*

The tool used was the Penelope EQUATOR Wizard [1], an automated decision tree which asks authors to provide binary information regarding their study to calculate the study type and the relevant reporting guideline [2]. The tool includes 11 commonly-used guidelines.

A question was introduced into the submission system for each of the journals linking to the EQUATOR Network website and prompting authors to follow the relevant reporting guidelines for their study type (Box 1a – the 'before' group). After 7 weeks the question was updated to include a link to the decision tool and a second prompt to check for relevant guidelines (Box 1b and c – the 'after' group).

Box 1a: Submission questions

a) Initial question introduced to the submission system

Standards of reporting

[journal name] advocates the complete and transparent reporting of research and methods. Authors are required to append the appropriate reporting guideline checklist to their manuscript on submission where applicable. Checklists are available for a number of study designs from the EQUATOR Network. See BioMed Central's policy page for further information.

Please confirm you have included as additional files the required reporting guideline checklist (and relevant extensions) and flow diagram for your study type from the EQUATOR Network.

- I have followed the relevant reporting for my study type, and included a populated checklist with my submission
- Not applicable for my study

We recorded the authors' response to the submission question, what guideline they followed or if none were followed and what reporting guideline they should have followed or if there were none relevant. Study types with reporting guidelines that were not included in the tool were excluded from the analysis. Adherence of the manuscript to the reporting guidelines was not evaluated as a part of this study.

Each manuscript was classified as one of six possible outcomes (Box 2).

Box 1b and c: Submission questions

b) Altered question after introduction of decision tree tool

Standards of reporting

[journal name] advocates the complete and transparent reporting of research and methods. Authors are required to append the appropriate reporting guideline checklist to their manuscript on submission where applicable. Find the right guidelines for my study.

Please confirm you have included as additional files the required reporting guideline checklist (and relevant extensions) and flow diagram for your study type from the EQUATOR Network. See BioMed Central's policy page for further information.

- I have followed the relevant reporting for my study type, and included a populated checklist with my submission
- Not applicable for my study *[to c]*

c) Sub-question prompted by authors stating there were no applicable reporting guidelines

The EQUATOR Network have been working with Penelope to create a tool to help authors find and use the relevant reporting guidelines for their study. Find the right guidelines for my study.

- I have followed the relevant reporting for my study type, and included a populated checklist with my submission
- There are no relevant guidelines for my study type

Box 2: Outcomes measured

Possible outcomes

- Authors identified the correct reporting guideline
- Authors correctly stated that no reporting guidelines were relevant for their study type
- Authors correctly identified that there were reporting guidelines for their study type, but provided no information as to which
- Authors followed a reporting guideline that was inappropriate for their study type
- Authors incorrectly stated that no reporting guidelines were relevant for their study type
- Authors incorrectly stated that there were reporting guidelines for their study type

Statistical analysis

The percentage of manuscripts in each possible outcome was recorded both before and after the introduction of the decision tree tool. One-tailed Student's t-test for proportions was used to evaluate the difference between the proportions, with $\alpha < 0.05$ and H_0 that there were no differences between the proportions.

Results

590 manuscripts were included in this analysis – 300 in the before cohort and 290 in the after. There were no significant differences between the two cohorts at baseline.

There were relevant reporting guidelines for 75% of manuscripts in each group. The most commonly applicable reporting guideline was STROBE, which was relevant for 35% (n=106) of manuscripts in the before cohort and 37% (n=106) of manuscripts in the after cohort.

There was a significant increase in manuscripts where authors had identified the correct reporting guidelines for their study type – 16% in the before cohort and 25% in the after cohort (Table 1). There was also a significant decrease in manuscripts where authors incorrectly stated that there were no relevant guidelines – 27% in the before cohort and 16% in the after cohort.

In addition there was an increase, though not significant, in those saying that reporting guidelines applied but not providing any details relating to reporting guidelines in the manuscript – 23% in before cohort and 29% in the after cohort.

Table 1: Numbers of manuscripts in each outcome

	Before	After	Δ	p-value
No. of submitted manuscripts with relevant article types	300	290	−10	
No. with applicable reporting guidelines	224 (75%)	217 (75%)	0.1%	0.98
Correct reporting guideline	49 (16%)	73 (25%)	8.8%	0.000002
Correctly stated none relevant	72 (24%)	60 (21%)	−3%	0.33
Correctly stated reporting guideline applied, but not which	68 (23%)	85 (29%)	6.6%	0.07
Incorrect reporting guideline	7 (2.3%)	3 (1.0%)	−1.3%	0.22
Incorrectly stated none relevant	82 (27%)	46 (16%)	−11%	0.0007
Incorrectly stated reporting guideline applied, but not which	22 (7.3%)	23 (7.9%)	0.6%	0.75

Conclusions and next steps

- Providing authors with a tool to assist in identifying the correct reporting guidelines for their study improved the identification of the correct reporting guidelines.
- Including this as part of the submission process ensures that authors provide a response to the question, but may lead some authors to choose a response simply to complete the submission process.
- Introduction of the tool increased the numbers of manuscripts identifying reporting guidelines and fewer authors incorrectly stating that no guidelines are relevant.
- Our next step is to identify approaches to prompt authors to use the tool before submission to enable them to identify the guidelines they need at an earlier stage of manuscript preparation.

References
1. http://www.peneloperesearch.com/equatorwizard
2. http://www.equator-network.org/wp-content/uploads/2013/11/20160301-RG-Decision-Tree-used-for-EQUATOR-wizard-vn-1.pdf

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