

Assessment of publication bias in systematic reviews of health services and delivery research



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Background

- Publication bias is a major threat to the validity of systematic reviews
- Strategies to identify and minimise publication bias are routinely incorporated into systematic reviews of clinical interventions, but the level of adoption of these strategies in systematic reviews relating to health services and delivery research (HSDR) is unclear
- The objectives of this study were to describe the characteristics of systematic reviews of HSDR with regards to assessment of publication bias, and to evaluate factors associated with this

Methods

- A stratified random sample of 200 systematic reviews of quantitative HSDR published in English from 2007-2017 was selected from the Health Systems Evidence database:
 - ✦ 100 reviews evaluating interventions to improve the effectiveness/efficiency of service delivery, for example by synthesizing comparative studies (intervention reviews)
 - ✦ 100 reviews evaluating associations between variables along the service delivery causal chain mostly by synthesizing observational studies, for example the association between nurse-patient ratio and frequency of patient monitoring and in-hospital mortality (association reviews)
- Data extracted included: any reference to publication bias across studies and outcome reporting bias within individual studies; methods for detecting/mitigating publication bias or reasons for no assessment of this; number of included studies; inclusion of meta-analyses, and whether the use of a systematic review guideline was reported
- Journals were classified into those that did or did not formally endorse specific systematic review guidelines such as PRISMA, and journal impact factors were obtained
- Factors associated with the assessment of publication bias were explored using multivariable logistic regression. Odds ratio (OR) with 95% confidence intervals were used as measures of the strength of association

Results

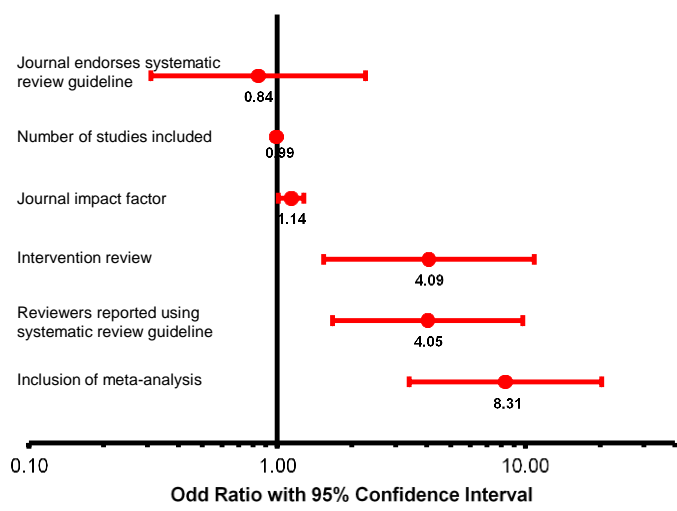
- Of the 200 systematic reviews, 48% commented on publication bias (Table 1). However, only 25% formally assessed publication bias either through statistical analysis (mostly funnel plots) or as part of the quality assessment of included studies (e.g. the Cochrane risk of bias tools)

Table 1: Characteristics of selected systematic reviews

Characteristics	All [n (%)]	Association [n]	Intervention [n]
	n=200	n=100	n=100
Number of included studies [median (IQR)]	19 (10,34)	25 (13.5, 42.5)	15 (9, 25)
Meta-analysis included	43 (21.5%)	10	33
Mentioned publication bias	95 (47.5%)	33	62
Assessed publication bias	49 (24.5%)	9	40
Journal endorses systematic review guideline	140 (70.0%)	69	71
Reviewers reported using systematic review guideline	73 (36.5%)	28	45
Journal impact factor [median (IQR)]	3.00 (2.26, 5.10)	2.66 (2.07, 3.39)	3.55 (2.30, 7.08)

- Insufficient number of studies, heterogeneity and lack of pre-registered protocols were the commonly reported impediments in assessing publication bias
- In the multivariable analysis, assessment of publication bias was associated with: inclusion of a meta-analysis within the review; reviewers reporting the use of systematic review guidelines; being an intervention review, and; journal impact factor (Figure 1)
- Assessment of publication bias in the systematic reviews was not significantly associated with number of studies included in systematic reviews or journal endorsement of systematic review guidelines

Figure 1: Factors associated with the assessment of publication bias in systematic reviews



Conclusions

- Overall, the awareness of publication bias in HSDR reviews is comparable to that of reviews of clinical interventions. However, formal assessment of publication bias is less common especially in association reviews. This reflects the heterogeneity of HSDR evidence and the limits of current tools for assessing publication bias
- Most of the systematic review guidelines include publication bias as one of the items and the findings of this study suggest that reviewers who use systematic review guidelines are more likely to assess publication bias
- Promoting adherence to existing systematic review guidelines may help to improve the assessment of publication bias

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<http://warwick.ac.uk/publicationbias>

